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**THE NEXUS BETWEEN THE ROLE OF
THE STATE, MARKET TRANSITION
AND FOOD CONSUMPTION**
THE CASE OF *SAMARKAND*, UZBEKISTAN

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Thesis submitted for the degree of
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Abstract

Although simple connections are often drawn between agricultural commercialisation and food security, nevertheless evidence is far more complex because of the context-specific and multidimensional dynamics by which market transition proceeds. This PhD looks at the case of Uzbekistan by investigating the production patterns and consumption patterns of four groups of producers. The research adopts mixed methods. The quantitative component is a purposive farmer survey which helps to explore the microeconomic implications of agrarian economy on food access, dietary diversity, assets and labour. This has been complemented with semi-structured interviews to relevant stakeholders to broaden up the question on what is the political economy implications of the different agrarian productions for different farmers, and how it relates to food provision and socio-economic transformation. It begins by questioning measurements of commercialisation and market integration, and proposes an alternative way of understanding marketisation in the Uzbek context. It then investigates the nature of consumption patterns and reflects on inadequacy of available measures of food consumption and diets. Despite this, clear patterns are drawn, which are then used to construct an analysis of which way food regime in Uzbekistan has been proceeding, and the role of the state in shaping it. The contribution of this PhD is to add an empirical basis of an under-researched country, and to contribute to the theorization of the relationship between market transition, food outcomes, and state interests.

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Acronyms and abbreviations

CIS- COMMONWEALTH OF INDEPENDENT STATES

DHS – DEMOGRAPHIC HEALTH SURVEY

FANTA – FOOD AND NUTRITION TECHNICAL ASSISTANCE

FAO – FOOD AND AGRICULTURE ORGANISATION

F&V /FFV- FRESH FRUITS AND VEGETABLES

FDIs- FOREIGN DIRECT INVESTMENTS

GIZ- THE DEUTSCHE GESELLSCHAFT FÜR INTERNATIONALE ZUSAMMENARBEIT

GDP – GROSS DOMESTIC PRODUCT

GOU – GOVERNMENT OF UZBEKISTAN

ICARDA- INTERNATIONAL CENTER FOR AGRICULTURE RESEARCH IN THE DRY AREAS

IDDI - INDIVIDUAL DIETARY DIVERSITY INDEX

IFPRI – INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

HA – HECTARES

HH- HOUSEHOLD

HVC – HIGH VALUE CROPS

KG –KILOGRAMS

LICs – LOW INCOME COUNTRIES

MDG – MILLENNIUM DEVELOPMENT GOAL

MNCS – MULTI NATIONAL CORPORATIONS

MT – MILLION TONNES

NGO – NON GOVERNMENTAL ORGANISATION

NIE – NEW INSTITUTIONAL ECONOMICS

PWC- Post-Washington Consensus

SOP- SYSTEM of PROVISION

SSA – SUB-SAHARAN AFRICA

WB- THE WORLD BANK

UNICEF – UNITED NATIONS CHILDREN’S FUND

UNODC- UNITED NATION OFFICE FOR DRUGS AND CRIME

USD – UNITED STATES DOLLARS

USDA – UNITED STATES DEPARTMENT OF AGRICULTURE

UZB Soum/SUM- UZBEK NATIONAL CURRENCY

NOTE ON ORTHOGRAPHY

In the course of the thesis, some Uzbek and Russian words are used. The English translation is provided for each of them in the text, at least on their first appearance, the main one are also described in the syllabus here below. With regard to orthography, a decision was made to adopt the Uzbek-modelled orthography for those words.

Glossary

Dekhan: smallholders’ farmers who do not manage state-crops (cotton or wheat) and have only access to their tomarqua to cultivate their crops, usually fruits and vegetables.

Tomarquas: the plot of the *Dekhans*

Fermers (also called farm managers): *Fermers* can be of two types. One type is a large farm which manages the production of state crops cotton and winter wheat. One other type is a large farm which produces winter wheat for the state, but also commercial fresh fruits and vegetables. The farm manager have also a tomarqua in their house.

Farm Wage workers: (includes non-permanent workers) in this research are defines as workers on *fermers* or in agro-businesses, either casual or annual. In many cases, *dekhans* are farm wage workers, but such overlapping was resolved once I identified which activity was the major source of income. If the main source of income was wages, I classify them as farm wage workers. If the main source of income was the sale of their output or off-farm sources of income, I would classify them as *Dekhans*.

Chapter 1: Context, scope and personal motivations of the research

Agricultural development is many-sided, complex and often contradictory in nature. It involves different sets of social forces originating from international, national, regional and local arenas. The interplay of these various forces generates specific forms, directions and rhythms of agricultural change.

(Long and Van der Ploeg, 1988: 37)

This PhD research investigates, through a political economy approach, how the Uzbek agrarian transformation affects market dynamics and food consumption. These linkages are relevant for a range of reasons. First, because they inform the development patterns by shifting and shaping the forms of capital accumulation and power relations. Secondly, because they change the relations between producers and consumers of food and ultimately the role of markets. Thirdly, because they trigger and are embedded in structural systemic shift in the economy at large, beyond agriculture.

1.1 Why this research?

This thesis expands the body of work on agricultural production and the agro-food nexus in transition economies by linking the stages and systems of production, exchange, and consumption. Such a holistic approach builds on previous empirical research that has tended to focus on each of these systems in isolation, thereby missing important social and economic dimensions that this research teases out.

The economic transition of Central Asia and the Republics of the former Soviet Union is under-investigated within the Social Sciences in comparison to other regions of the 'South'. The scarcity of secondary sources and statistical data to produce rigorous economic research has been both a struggle and a motivation to try to fill this gap. Indeed, the political and social challenges and mechanisms behind the transition towards capitalism and its implications for agrarian change make this region extremely fascinating.

This research also builds on my own research which has investigated the impact of economic distortions applied to agriculture for Uzbek development. Throughout history, cotton has been a major source of foreign currency playing a key role for the economic transformation of many countries. Uzbekistan is the fifth largest cotton producer in the world, and the cotton trade is integrated in international markets. Whereas in many other producing countries in South Asia and Sub-Saharan Africa the cotton sector has been deregulated and liberalized, often associated with negative social and economic consequences (Oya, 2007; Chang, 2009; Kay, 2009; 2002) Uzbekistan has embraced heterodox policies based on public interventions,

central planning and import substitution. These policies, it is argued, have supported dynamics of structural transformation and poverty reduction.

Hence, this case study offers an opportunity to extend empirically and theoretically the study on the potential alternatives to neoliberal policies and how their implementation affects economic transformations in low and middle income countries. In particular, this thesis investigates how the Uzbek heterodox production and marketing systems of crops shape agrarian social relations of production. Assessing patterns of food security (or diet outcomes) in countries which adopted export-oriented agricultural strategies is not straightforward and depends on the intersection between international input-output (import-export) relationships and on local social relations of production. The relationship between cash-crop production and food consumption has not yet been investigated in this part of the world.

This research expands the theoretical debate applied to Uzbekistan because it challenges the dominant Uzbek literature which considers the state and the market as dichotomous categories. Instead it looks at the dialectic of those dimensions within the market society (Polanyi; 1944). Indeed, in low-income countries, the role of the state has been a crucial vehicle for value creation and value transfer across sectors and for the functional upgrading of the agrarian productive structure. Furthermore, in Uzbekistan economic and social institutions are the products of many influences coming from the Soviet Union, the Mogul, the Persians, Mongols, Arabs, Chinese, and Koreans. A mixed methods research was adopted to grasp such peculiar and complex social and economic relations, to help link the micro and macro aspects of the socio-economic structure, and to triangulate and confirm certain hypothesis.

Last but not least, I have worked in Uzbekistan as an international consultant for International Development Organizations for three years, therefore there is a personal curiosity that pushes me to understand this context through an academic lens.

1.2 The structure of the thesis

As Bernstein rightly stated in one of his convincing reflections, “commodity studies have no common purposes, object of analysis, theoretical framework or methodological approach” (2006:240). Comprehensive studies on agrarian change and commodities may be indeed interdisciplinary, grasping from economic history, political science, economics, business management and anthropology. Therefore, to accurately analyse the relationship between

relation of production and the sphere of consumption and its interplay with the markets, **chapter 2** starts exploring the ontological interpretations of subsistence and commercial agriculture. Section 2.2 reviews the different theoretical understandings, empirical evidence and epistemological approaches on agricultural commercialisation and food production. It looks at the neoclassical and the institutionalists' school and outlines the relevant analytical variables from the commodity value chain's literature. Section 2.3 focuses on the political-economic theory of modes of production and class analysis. Such diverse strands of theory will highlight different analytical tools to understand the drivers, mechanisms, measurements and outcomes of agrarian commodity production. The political-economy approach will serve as analytical foundation of the thesis.

Chapter 3 introduces the concepts and analysis on food security. It reviews the empirical studies which explore the linkages between agrarian commercialisation and nutritional outcomes, by also underlying the multidimensionality and context-specificity of such relationships. Section 3.2 discusses the nexus between market transition and crop-diversity and section 3.3 looks at how the macroeconomic debates have understood and theorised the changing structures of agriculture and its impact on the food markets and consumptions.

Chapter 4 critically discusses the interdisciplinary literature produced on Uzbekistan. Section 4.2 outlines the state reforms that shaped the two contemporary units of production of the Uzbek agriculture: first, the small-holder peasantries, the *dekhans* that produce for subsistence food crops and for the local markets in their household plots called *tomarquas*. Second, the *Farmers* that, on top of their small household plots (*tomarquas*), manage through state-concessions large-scale farms producing either cotton and wheat, or wheat and vegetables and produce for state procurement and for commercial channels. It also explores the agrarian change studies in Post-soviet countries which paid particular attention to class formation, differentiations and agrarian transformations in relation to access to land, wage labour and assets. Section 4.3 outlines the available empirical studies on food consumption in Uzbekistan. At the end, for each component of the analysis it will be identified a research question.

Chapter 5 identifies and discusses the methodological approach adopted in this research to organize the data collection and to answer the research questions. In particular, the quantitative and qualitative components will be discussed in their strengths and limitations, in view of the methodologies adopted in similar case studies. A timeline of the research and fieldwork material are provided in the appendix XIII.

Chapter 6 identifies the productive and commercial mechanisms that affect, either directly or indirectly, agrarian class differentiation. I show that each crop has been subject, through *ad hoc* state-policies which gave nature to different access to inputs, labour, market channels and assets, to different commodification patterns. It will unveil how the state and local producers and consumers exercise their power in the agro-food system. The relational lens allows us to capture the circular nature of food production, commodification, distribution and consumption. It is shown that in such modes of production, agencies within the state and in society are dialectically linked and organised, categories too often 'atomised' in the literature. In particular, I show that the cultivation of state-supported cotton and wheat has given nature to peculiar form of crop marketisation and stratification.

Chapter 7 will explore how the differentiation and social stratification assessed in chapter 6 correspond to different use, access and outcomes of food consumption patterns. It will try to untangle and discuss different variables and drivers contributing to shape the food system and food use, access and preferences. It will expand the analysis on the determinants of food choices, in particular on how market forces, gender, social norms and the economy shape food consumption. Also, it will reflect on the methodological limitations of the tools used in the studies on food consumption.

Chapter 8 develops an empirical and theoretical understanding of the relationships and underlying mechanisms on the linkages among production, market exchange and food consumption patterns. Firstly I will explore the relationship between wealth and dietary diversity; secondly, I will explore the relationship between market and crop diversity; thirdly, I will look at the relationship between crop-diversity and dietary-diversity and lastly at the nexus between crop marketisation and dietary-diversity. It is shown that, although quantitative results show a significant and positive relation, to obtain a comprehensive understanding of the trade-offs and synergies around agriculture, wealth and food consumption, multidimensional and qualitative (non-economic) aspects need to be inserted into the analysis. It will also reflect on the epistemological tensions within the literature of commercialisation of cash-crops.

Chapter 9 looks at the broader macro-dynamics affecting agrarian production and food consumption. It will draw upon the literature on food regime and adopt a system of provision approach. Firstly, I analyse how macroeconomic policies contribute to shape the micro social relations of production and reproduction. In particular first, I look at how domestic regulatory mechanisms contributed to the innovation of processing patterns and secondly, how trade

policy shaped the way in which the food is produced, commercialized, accessed and consumed. Thirdly, by investigating the social relations of production which underlie *what, who and how crops* are produced, I will unveil processes and structures around the system of provision of selected agrarian commodities. The interplay between the state and the transnational exchange system is here explored in relation to the challenges of employment creation, food security, surplus accumulation and transfer, and the constraints to gain competitiveness in the international market.

Chapter 2: Market transition and agriculture

2.1 From food for subsistence to commercial commodity

Historically, the primary objective of agriculture was to produce food to satisfy human reproduction. Many social scientists have developed interests on the evolution of agriculture, namely the passage from the stage of subsistence to more sophisticated stages of commercialisation. Those studies are inserted either in the *macro*-level debate of the national agricultural policy, or at the *micro* farm level. In this section I am going to focus on the latter and investigate the definitions of '*subsistence agriculture*', '*commercial agriculture*' and '*cash-crop*' to set-up the categorical foundations of this PhD. In the rest of this chapter I look at theories that discuss these concepts.

These concepts have been used in different ways in the literature and each author has given emphasis to the different connotations. The *etymology* of the word *subsistence* is very interesting for the scope of this research: it can be broken down in the words 'sub' and 'stay': namely, being able to stay, 'stand still or firm'. In other words, survive independently from others or from something else. Generally, subsistence farmers produce *food* for its use-value which entails a direct consumption. Von Braun et al. applied the term 'subsistence' to two different dimensions: the first one refers to the conditions of existence of humankind, subject to "a minimum standard of physical and mental survival and productive efficiency" (1991:35). The second one refers instead to the production of good for consumption in the household, seen as the basic unit of production. Furthermore, it can be identified a distinction between *subsistence of production*- namely subsistence farmers which are not selling crops- and *subsistence of consumption* - which means that farmers do not buy inputs or other consumption goods in the market. These two types of subsistence entail different patterns of consumption determined by different factors such as a) real income and *purchasing power* [which correspond to] b) different access to food thus nutritional and welfare status, including *dietary diversity* (Von Braun et al, 1991) and suggest c) a similar but specific relationship with respect to the *market* as producers and as consumers.

Looking for definitions of subsistence within the agrarian political economy literature, Bernstein refers to 'subsistence' as the supply by farming household of its own food which is produced for simple social reproduction (2010:3). In this definition, it is emphasised that the goal of production is the direct and final consumption of outputs, aimed at self-sufficiency. Hence, 'subsistence' generally aims at satisfying directly, bypassing the market, the condition of physical reproduction by securing food. The sufficient but necessary condition to satisfy

social reproduction is the access to the means for subsistence, namely land, inputs and labour time to produce food. In the sphere of subsistence, what is produced holds a use-value and a labour-value, realised in the process of consumption given by its physical utility, but not an exchange-value, meaning it does not have a 'proxy value' identified by a price through which can be bought and sold in the market (Bernstein, 2010).

Commercialisation is commonly defined when a good becomes a commodity as it is inserted in the market (Marx, 1867). Such integration often entails a transformation of production, but does require also an organization of the phase of distribution and sale. Those are the necessary activities to make the goods successful in the sphere of exchange and survive market competition with other commodities. The objective here has shifted from direct consumption to economic profit.

It is interesting to look at commercialisation through an historical perspective (Fine, 1994). In fact, the word 'agriculture' became popular with the rise of industrial capitalism from the 1870s, due to the deepening of sectorial division of labour and specialization of production (Bernstein, 2008). Those categories are opposed to and treated differently from 'farming', namely the activity that farmers do, which merge into agriculture once it is shaped by economic interests, specialised market institutions located upstream and downstream (ibid). Therefore, the ontological separation of agriculture and industry in two different sectors is the result of the process of commodification and it is a useful analytical entry point to understand the operationalization of commercialisation in agrarian production.

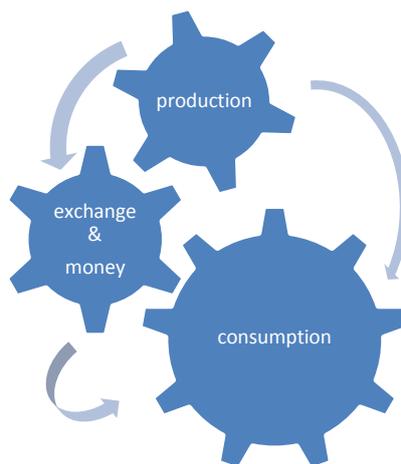
Cash-crops are produced in commercialised agriculture for their commercial value rather than for the use of its grower¹. Kennedy and Bouis (1993) defines cash-crops as crops for sale. Poulton et al. define cash-crops for being: high-value commodities; handled through concentrated marketing system; produced through the use of purchased inputs; and internationally tradable (1998:7). Maxwell and Fernando (1989) provide an additional classification: a) all marketed surplus, b) non-staple agriculture, c) non-food agriculture. Under a mainstream lens, Fafchamps et al. (2003) describe cash-crops as integrated in the national market whereas food market as local and 'thin' by nature. Another regularity observed is that large farmers devote their land to cash-crops whereas small-holders produce more food, so no overlapping is contemplated (ibid). It is important to note also that cash-

¹ Oxford Dictionary access 22/02/2015. <http://www.oxforddictionaries.com/definition/english/cash-crop?q=cash+crop+>

crops, if exported, are a crucial source of foreign currency which can contribute to finance industrial or agricultural investments, to the creation of employment and long-term growth (WB, 2007; Timmer, 2008; Lombardozzi, 2016). Thus, the increasing degree of sophistication of the form of exchange transactions and potential returns increases the pressure for competition and profit-making.

In conclusion, it is argued that *subsistence* and *commercialisation* have opposite drivers: the former aims at minimizing risks as opposed to the latter which aims at profit maximization (Leavy and Poulton, 2007). Although the mainstream literature has depicted commercialisation as a desirable positive outcome however, at the operational level, it implies an alteration of the social condition of production (Taylor, 2007:531). The objective of profit implies different production and distribution dynamics from those that define subsistence goals. The diversion of land and labour use and change in productivity and correspondingly profitability will have implications for the subsistence crops and the 'industrious and frugal peasants' (Smith, 1776:45), thus for food consumption (Von Braun, 1994). We will see how these two directions are the main opposing dichotomies identified in the neo-classical literature (Chayanov, 1966; Bernstein, 2006). Figure 2.1 shows that the commercialisation process creates new barriers – money in exchange of commodities- in the social relations between producers and consumers. Marx defined this passage as *commodity fetishism*.

Figure 2.1- Commercialisation



Source: author

However, such binary definitions can be misleading. Indeed, every food-crop can adopt the status of cash-crop once it becomes commercialized. Also, studies observed that sometimes the *exchange-value* overtakes the *use-value* (or vice-versa), creating potential *competition effects* with negative repercussions on food availability (Wiggins et al., 2015). Indeed, sometimes cash-crops can be consumed as food, and food crops are also exchanged and can enter in direct competition with the food needs of the household so that the two functions overlap making such a dichotomy not always linear. Furthermore, cash-crops can be produced in hybrid settings where inputs are non-commodities, or where staples are extremely commercialised. In this sense, it is not sufficiently acknowledged that the way food and cash-crops are defined and classified affect the way reality is studied and interpreted. In other words, how food *versus* 'crops for the market' shapes the *relations of production* and *reproduction* through its productive, exchange and most of all, consumption dynamics has been insufficiently explored in the most recent literature, so the need to investigate further such 'artificial' binary relationship. One of the contributions of this thesis is to reflect on the definitions of cash-crop and food crops, and how those categories are deployed in the context of Uzbekistan.

Without falling into natural determinism, it is crucial to acknowledge that the material and organic specificities of each commodity's cycle affect the organization and realization of labour, either for *use* or for *exchange-value*, which nonetheless, it is not always valorised through the market (Kautsky, 1998). Therefore, it is necessary to make explicit some fundamental characteristics of food as both a *commodity*, a *human need*, and as an economic *sector*. Food, as opposed or in addition to many other commodities production, holds some special peculiarities (Fine, 1994; 2002; Kautsky, 1988):

- 1) Its consumption is a *sine qua non* condition for the social and human reproduction. Food is in fact the only source of nourishment (Sobal et al., 1998). Otherwise put it, in the hierarchy of human needs, food is the most important consumption good (Chang, 2009:482).
- 2) Its production is conditional to biological and eco-systemic factors such as land, climate-ecological conditions and nature uncertainties. For instance, in agriculture production time exceeds labour-time because the final good depends on the natural rhythms of plants and animals (Bernstein, 2010). This specific *temporality* is crucial to consider when studying food as commodity and rural production in capitalism.

Indeed, the *capital* invested in agriculture can contribute to minimize risks related to the organic components, or increase its productivity.

- 3) The nature and scope of agricultural production can raise tensions between the immediate needs of social reproduction (use-value of food-crop or fibre-crop) and commercialisation (exchange-value) (Fine, 2002; Kautsky, 1988; Byres, n.d).
- 4) Although it creates value, because of its perishability, food very often holds intrinsic decreasing value over time (i.e. inverse marginal utility) exacerbated also by the costs of maintenance/storage (Fine, 2002).
- 5) It can provide raw materials to the manufacturing and other capitalist sector (Byres, n.d.).

2.2 Interpretations of commercialisation

2.2.1 The neoclassical interpretation

A simplified story widely described in classical economics is that commercialisation typically originates from an evolution of subsistence production, it passes through semi-subsistence and it ends up with production of food commodities for sale (e.g. Rostow, 1960). Such unidirectional and linear transition is, in this view, the desirable passage and outcome to economic development as it creates revenue in agriculture and maximize output. Commercialisation has been indeed associated with the necessary passage to the 'modern' economic transformation. The reason is because the producer (specifically through self-employment or employed labour-power) would potentially be able to capture some of the surplus value generated from the cash-crops, invest in technology, enhance productivity and eventually, implement economy of scale. The resulting specialization of the division of labour will develop the market (Taylor, 2007:531), improve overall social welfare through competitive wages and food prices and thus bring development. In general, commercialisation hints towards an increase of the degree of participation in the output market and thus through cash-income (Leavy and Poulton, 2007). The sphere of exchange value is here realized.

Although some scholars within neoclassical theory acknowledged that commercialisation is an open window to new *risks* and *uncertainties* due the intrinsic characteristics of market

mechanisms (Kennedy and Von Braun, 1994), the widest share of the mainstream literature looks at the cash-crop under a positive perspective. It sees the market as an *opportunity* and an *incentive* for the growth of the agrarian economy (e.g. Fafchamps 2003). In von Braun and Kennedy "Subsistence production for home consumption is chosen by farmers because it is subjectively the best option, given all constraints. However, it is globally one of the largest enduring misallocations of human and natural resources, and, due to population pressure and natural resource constraints, it is becoming less and less viable"(1994:3-4). The intensification of agricultural commercialisation, through the improvement of productivity and profitability of smallholders farming (WB, 2008:10) it is indeed perceived among policy makers and academics as a mean to get out of poverty in rural areas (Leavy and Poulton, 2007), where the poorest of the poor live. International development agencies see intensification and commercialisation of small-holder agriculture as the principal driver of delivering MDGs (CAADP, 2011). In many studies looking at SSA, education, farm-size and technology are seen as determinants of commercialisation's levels (Falola et al. 2014). Supply-side and market-oriented reforms are in this framework seen as instrumental for improving the material conditions of the agrarian producers.

In the neoclassical perspective, if external distortions such as subsidies or price regulations do not occur, an ideal perfect competitive market could absorb shocks and adjust, through price and quantity supplied, the fluctuations of food and agrarian commodities to ensure an efficient allocation of resources. In particular, looking at the household's propensity to risk, Fafchamps (1992) concluded that semi-subsistence farmers tend to produce risky cash-crops when the consumption effects, defined as the amount by which expenditure would have to change after a shock to maintain marginal utility constant is greater than the income effect, which is a change in income due to a shock (von Braun and Kennedy, 1994:22). Generally this will depend on the income elasticity of demand of risky crops, but also prices, wage levels, household size and technology are considered as explanatory variables. In other words, growing a particular cash-crop can serve as insurance against its consumption price (Fafchamps, 1992). In this perspective the market mechanisms would satisfy food security objectives due to automatic adjustment of production, productivity gain, prices and consumption.

Looking at the issue of land, the neoclassical neo-populists are strong supporters of land redistribution, namely the breakup of large farms into new small farms (Byres, 2004; Johnston, 2010). This policy is supported by the theory of the inverse relationship (see debate on *Journal*

of Agrarian change Vol 4, 2004 i.e. Byres, 2004; Dyer, 2004). The inverse relationship theory asserts that, through land redistribution, both output and yields (output per hectare) will increase. This reform will address both the issue of social equity, political stability and economic efficiency in poor countries (Oya, 2009). Given the scarcity of capital and abundance of family labour (Johnston & Le Roux, 2007), land redistribution is justified because it leads to higher labour productivity, outputs than large farms (Lipton, 2009; WB, 2003; 2013). Yet, critical reviewers have pointed out the weaknesses of this policy (Sender & Johnston, 2004). In particular, the static and ahistorical approach of the inverse relationship ignores the dynamic processes of structural transformation and class formation, the role of the state through the use of economic distortions and the broader development of capitalism in the countryside. For instance, Kay (2002) shows that in the case of Taiwan and South Korea, the government exercised coercive control to promote productivity of small-scale farms, while investing in rural infrastructure. In particular, the IR supporters ignore that industrialization and structural change have been the major driver of poverty reduction in a context of unequal resources and imperfect competition. Furthermore, buyers have often bought the redistributed land at extortionary prices, which did not empower the new owners but rather perpetuated asymmetrical power relations within market transactions between the old land owner and the new buyers, especially in absence of post-transfer support from the government (Johnston, 2010). Although this issue is not central for the scope of this research, it is relevant to discuss it because it has influenced profoundly the dominant agricultural policies on land and it will be empirically tested in this case study (Chapter 6).

In the neoclassical perspective, prices are treated as the result of supply and demand in the market through which individuals and rational decisions are taken based on individual marginal utility and preference-satisfaction (Byres, 2004; Arnsperger and Varoufakis, 2006). Food and land is here treated as any other commodity and power relations are treated as exogenous. Longhurst, by admitting the context-specificity of markets, asserts that the introduction of cash-crop can have both efficiency and equity benefits. Cash-crops are profitable for farmers because of their higher returns on land and labour, not least income from sales (ibid; Kennedy, 1987). They underline that households that invest in cash-crops sacrifice rarely their production of subsistence crops. Moreover food market integration would reduce food prices variances (Fafchamps, 1992) and be able to absorb shocks through prices' adjustments. In these terms cheap credits and inputs, fixed output prices, are classified as 'distortive' incentives which are unnecessary at best, and harmful at worst. In

this fashion, Fafshamps asserted that market integration reduces the need for food self-sufficiency based on the rationale of standard 'portfolio diversification' (1992:2).

Depeuch and Leblois (2014) investigated through a quantitative comparative study that the impact of deregulation on cash-crop production generated an increase of supply of output and improvement in productivity in Asia and transition economies as opposed to the negative effects observed in some SSA. They conclude that the contrasting results are due to different competition effects materialized through different market organization. The underlying idea is that market competition and prices liberalization will create production incentives and push inefficient producers out of the market so that average yields will increase and prices decrease. In addition, it is also argued that market competition would improve the world price share received by farmers (farm-gate price), impact positively on the amount of inputs and efforts of farmers (2014:3). Privatization, similarly, will arguably minimize soft-budget constraints, create labour oversupply and political interference in the management (Baffes, 2007). Conversely, taxing and subsidising cash-crop is a form of inefficient rent maximization, which nevertheless, it is admitted, can avoid supply disruptions (Depeuch and Leblois, 2014). They also note that, in the short-run, market has to be improved to support production and productivity beyond cash-crop by incorporating (formalising) non-market forms of input mechanisms and social safety nets decoupled from cash-crops. Depeuch et al. argue that, although heterodox policies might have beneficial effects in case of high transaction costs, in the long run orthodox reforms are beneficial to reduce public budget depletion, ensure macro-economic stability, boost productivity and diversify from cash-crop in case of inefficiency (2012). Post-market safety nets would be able to help the 'losers' of the game. Here market is perceived as neutrally shaped.

Thus, by treating subsistence as a constraint, this literature tried to identify its causes. Fafchamps notes that the lack of transport, roads, and markets infrastructure in developing countries contributes to hamper the effective integration of domestic and international markets (1992). Authors also refer to a situation of scarcity, lack of employment or underproduction. One reason mentioned by Swinnen and Vandeplas (2011), sharing this view of 'missed occasion' is the fact that farmers do not have time to look for alternative opportunities other than subsistence farming, because of the constrained nature of subsistence farm work, on time and space. Lastly, the unreliability of prices make households want to feed themselves first (Fafchamps; 1992).

The structure, politics, institutions and historical processes in which such farmers are inserted, their power relations, the transaction costs of such exchanges within such self-regulatory market are left unexplored with no analytical understanding of how efficient allocation and equilibrium will occur (Fine, 2016). Moreover preferences and tastes are treated as exogenous and static, and autonomous from social influences, necessities, constraints or intra-household dynamics (Beneria et al., 2016). In sum, farmers are here depicted as a homogenous category that in a friction-less environment access markets and absorb shocks and risks through market transactions and automatic adjustments. In the neoclassical vision of commercialisation, market access, achieved through supply oriented policies, is both an enabler of growth and an objective *per se*. In the mainstream debate the unintended implications of the commercialisation transition are not considered. In addition, market is studied through its operationalization, but not how it develops (North, 1994). For instance, the capitalist mode of production in which commercialisation and marketisation takes place transforms social relations of production in a way that some of the producers (peasants) become wage-labour power. This passage is ignored in the analysis. Although they maintain their role of producer, peasants do not access their labour' output through direct consumption because of time constraints or because of the denied access to the means of production. Those transitions and shifts in the role and agency of producers, products and inputs are a cost-free process driven by the objective of profit maximization and marginal utility, symmetrical information and boosted by price incentives which should not be distorted. Thus, commercial agriculture is here identified as an intensification of the process of production which creates a system of commodities where the welfare gains of producers are maximised and will eventually converge through market mechanisms. Lastly, the state in a liberalised market is supposed to be involved in economic activities as little as possible, and only guarantee private property rights, the rule of law, and institutions which ensure deregulated markets and free trade (Harvey, 2004). In the next paragraphs, by discussing the arguments raised by the NIE literature, I will explore the limitations of the neoclassical theory.

2.2.2 WB-PWC and NIE interpretation

New Institutional Economics (NIE) sees a more complex relationship between crops and markets (Poulton et al. 2006, 2008) and focuses on the role of institutions to make the market works. However, similarly to the neoclassicals, NIE economists assert that commercial agriculture requires more advanced inputs but also that its returns are higher than food crops because more profitable (Swinnen et al., 2010). Their works are produced through the WB under the 'post-Washington consensus' era and have been focusing on addressing market

failures by reforming institutions and promoting 'good governance'. By extrapolating the strengths and weaknesses of specific crops 'markets, they address problems of inefficiency, competitiveness and productivity by looking at *incentives* and *risks*. This strand of thought supports the idea that the creation of the 'right' socio-legal and economic institutions, would reduce market risks for producers and resolve market failures.

For instance, Dorward (2007), looking at the commercialisation of small-scale coffee producers in Tanzania, recognises as constraints the high prices of inputs, the labour shortage and the lack of extension services. Also, he noted that privatizations worsened access to cheap processing facilities for cash-crops and how producers experienced difficulties finding a market to sell their products (ibid). In assessing the successes and failures of the trading and financial services after the market-oriented reforms on coffee, tea and sugar, Dorward concludes that a more transparent management system will result in more confidence of producers which will trigger the necessary incentives to engage in commercial production. Through a more inclusive governance of the managing boards, the authority would have to listen the farmers' requests. Smallholder farmers, are here described as able to influence and succeed in the market if provided better credit, information and 'opportunities' (Khan, 2013). Economic 'empowering' is seen as a friction-less process where power-relations do not influence distributional outcomes. In sum, institutional arrangements, ownership of the reform processes, (which should be consultative, transparent and farmer-centred) and strengths of farmers' voice are identified as the explicatory factors of a successful integration of farmers (in this case small-scale cash-crop producers) into commercial agriculture. In this perspective, credit mechanisms and better contract enforcements are identified as solutions. Poulton (2009) identifies in the lack of defined property rights, lack of credit, and aversion to risk the barriers that hamper a successful participation to the cash-crop market. The analysis is thus centered on 'attitude to risks' and choices are driven by 'risks versus returns' which define rents, coordination and opportunity costs.

The enhancement of competitiveness of smallholder farmers is believed to be the effective solution to reduce poverty. By comparing different African experiences of commercial agriculture, Tschirley et al. analyse costs and benefits of large and small holder's settings, and which are the implications on returns to investments with respect to capital, land and labor (2008). They identified four challenges faced by small holder cotton producers: provision of input credit, maintenance of quality control, maintenance of high quality research system and payment of 'desirable' seed cotton price (2004). Here the explicatory analytical categories

are still identified firstly within the market structure (i.e. purchase of seed cotton) and secondly within the regulatory framework. Competition and coordination are the two core drivers for economic success and, due to weak states and imperfect market, there is often a trade-off between these two.

Such analysis nevertheless offers some interesting reflections about the heterogeneity and dependencies among farmers. For instance, Poulton et al. 2008 list three farms' types that can engage in commercial agriculture. They classify them according to their labour use: a) family farms (i.e. smallholders where occasional labour supports sporadically the core familiar labour force); b) small investor farmers where the owner deals with management and it hires labour for production; c) large scale commercial farms where family is at the management level and the labour hired is very specialised. In general, large-scale farms are assumed to be totally commercial cash-crops producers. By contrast, for the other two categories the output destination is less clear. Although higher return is the standard determinant of agriculture commercialisation, authors acknowledge the acquisition of input or knowledge/information about credit as other reasons of market success. Poulton et al. noted also how farmers usually keep a share of land for subsistence crops even when returns in the market are higher (2006, Tschirley et al., 2008). This is linked to non-market reasons such as cultural local institutions, gender division of labour. Swinnen highlights similar links between cash-crops and food-crops by observing that cash-crops allow also for *spill-overs* on subsistence production by boosting food production and therefore food security (2010). Also, it is emphasised that, for instance, a newly introduced cash-crop requires different knowledge or climate conditions. Hence, NIE contemplate in the analysis a wider spectrum of forces other than profit-maximization linked to the context-specificity and social dynamics around commercial agriculture.

In this interpretation, the operationalization behind the crop commercialisation, in particular about the risk and incentives of *producing*, *investing* and or *switching* to a particular crop is emphasized and put at the front of the analysis. NIE supports the creation of effective 'market' institutions that would reduce the risks for producers and resolve market failures through incentives for competition. To enhance commercialisation, local market matters because its effectiveness would promote competition by eliminating the barriers to entry that disincentivise the participation in the market. Market structure and organisation thus play a fundamental role in NIE's thesis. On this, Poulton et al. stress the importance of preventing governments from 'meddling' in the sector's governance because its intervention, through compensation and subsidies, can bias producer returns (2008). In sum, NIE asserts that

commercialisation dynamics can take different pathways, and through appropriate policies, they can be inclusive towards small-holders and the poor. However, as Bargawi (2014) noted looking at the Tanzanian case-study of cotton production, institutional studies failed to address the causal factors of power asymmetry. NIE theoretical contribution, although it acknowledges the role of institutions and the complexity of the productive structures through sophisticated empirical studies, nevertheless it does not go deeper in assessing the causality beyond such market shortfalls. In the NIE approach the formal market is exclusive and it is generally described by neutrally defined actors which are involved in the production and commercial stages.

First, 'governance' does not have a horizontal structure. Indeed, the social relations of production that it 'governs' has to guarantee a *surplus value*, which is generated through the exploitation of labour power and efficient use of the means of production which inevitably lead to dispossession and exclusion (Nadkarni, 1991). Second, the power implications involving nutritional, gender, political and economic power are not thoroughly embedded in the analysis of NIE (Oya, 2004; Bernstein, 1996). The analysis of the power relations within rural institutions and the underlining social relations based on market competition that govern transactions are therefore superficially treated (Nadkarni, 1991; Oya, 2004; Bernstein, 1996), without accounting for the historical and political patterns of capital accumulation (Khan, 2012). Third, very often crops are used for different scopes outside the monetary value. Productive processes are influenced by formal and informal mechanisms such as affiliation, proximity and power that need to be taken into account (Khan, 2004; 2012). Indeed, informal institutions can rely on local networks outside the market but still operate under profit-driven decision making processes. Last but not least, market outcomes are defined in dichotomy with respect to state policies and practices. As Harris-Evans emphasises, it is important to look at how non-market structures shape power relations. Furthermore, food commodities are rooted in social bonds, accustomed diets, and cultural identity other than provide a safety-net from market risks (Isakson, 2009). Hence, their 'utility' is shaped by heterogeneous social values and uses that need to be unpacked in order to understand the complexities and specificities of the material relations of production. Therefore an informed political-economy perspective could be a helpful addition to the analysis.

2.2.3 CVC

So far I reviewed the contributions that neoclassical and NIE offered to understand the dynamics of commercialisation in agriculture. The Commodity Value Chain (CVC) and the

Global Production Network framework can enrich this research in assessing the role of different actors involved in the process of production and commercialisation of food and agro-commodities (Gereffi et al., 2005, Mann, 2008). GVC analyses the way in which production processes necessary for the creation of a commodity are modularised, fragmented, concentrated and distributed across networks and space (Palpacuer et al., 2005; Taylor, 2007:533). It looks at 'upstream' linkages involved in the initial phases of production, such as the provision of inputs for labour (tools, fertilisers, seeds) market for land, labour markets and credit and also 'downstream', which involves the processing, logistics distribution and sale stage (Ibid; Gereffi, 1994; 2005; Bair, 2005). The combination of downstream and upstream processes of delivering a crop into the market norms is the process of commercialisation. Those approaches look at inputs–output flow and prices, at the transformation of a particular good, to the commercial flows till the consumers including final disposal (FAO, 2005). CVC also assesses the potentials and sources for value creation throughout product or process upgrading, or more functional through new tasks and capabilities of agents and organizations (Crow, 2003; Gibbon, 2001; Taylor, 2007).

Upgrading in agriculture can be interpreted as an advanced phase of commercialisation, thus considered a desirable objective to create new horizontal and vertical linkages in off-farm services (Swinnen, 2006). Primary commodity processing triggers added-value activities (Sobal, 1989) and creates specialization in the division of labour thus increases employment opportunities in off-land jobs such as transport and distribution (Gibbon et al., 2005; Cramer, 1999; Marteens and Swinnen, 2007). It is emphasized that the upgrading of the agro-value chain, through the diversification of income sources, will contribute to raise wages creating expansionary effects for the economy through higher demand. That will improve farmers' wellbeing other than free resources from domestic food production (Dorward et. al. 2009; Collier and Dercon, 2013). The upgrading can be developed through: a) more sophisticated products; b) more sophisticated transformation of inputs; c) the acquisition of new functions and skills (Humphrey and Schmitz, 2002). The integration and coordination of different stages of production has to be in place to ensure such transformation. Therefore, it is crucial to ensure an efficient horizontal coordination in the use of resources (Poulton et al, 2005).

CVC therefore acknowledges that many actors are involved in the organization of the chain: a) firms including traders; b) financial institutions, borrowers and insurances which issue loans; c) households or firms as unit of production; d) governments which provide public services and investments and that can act as productive agents in the local production system;

d) buyers and sectorial managers and e) the 'rest of the world' which are the agents outside the country. According to the CVC framework, a commodity should be investigated through the assessment of the constraints and opportunities of the actors involved. Nonetheless, it is also recognized that regulations and market channels contribute to define the commodity (E.g. Gibbon and Ponte, 2005; Selwyn 2007) including the system of food provision (Sobal et al. 1989, Fine, 2002). In this sense, the commercialisation of the food is recognised as embedded in governments' policies. For instance, the government could promote 'distribution' programmes, through for instance food banks, subsidised bread or school feeding programmes (ibid). Because it looks at the multiple chains of production and it recognises the systemic linkages of activities and actors involved, CVC can indeed support the understanding of crop-specific organizations of production and distribution.

The CVC literature usually defines the agricultural sector as 'buyer-driven', because the buyers, very often multinational corporations, delineate the terms of the contracts with the farmers who have few barriers to entry. Weis (2007) underlined that powerful agents are present upstream in the 'agro-input' and downstream in the 'agro-food'. They affect how value and profits are distributed along the chain and create barriers for small producers through market information, sanitary, environmental and non-sanitary standards and electronically-based supply management system (Daviron and Gibbon, 2002). Agri-food corporations often put pressure on farmers and creates clear hierarchies among countries according to their capacity of scaling-up, organize or innovate technologically (Gibbon, 2001).

Different schools of thought have used this analytical framework, including neoclassical welfare analysis, Marxist political economy and management studies (Kydd et al. 1998). Although the CVC offers a useful framework to empirically map the productive actors and mechanisms around a specific industry and identify useful analytical categories, it nevertheless holds some limitations. First, the agents involved in the chain can have often contradictory and multiple functions and interests that overlap with other commodities. In particular, multiple businesses often tend to overlap affecting different organizational forms therefore products cannot be considered as an independent variable (Humphrey and Schmitz 2002:4; Louret, 1983). The atomistic way in which the system of commodity is treated risks thus to overlook the inter-linkages among them. Thus, it is necessary to look at the broader structural and systemic context in which commodity chains are embedded (Bair, 2005:154). Also, the CVC overlooks the consumption phases occurring after the commercialisation process is realized.

Furthermore, there are two additional reasons to expand from a 'single product chain' to a multidimensional systemic approach. The first reason is that the state, as economic agent and operator, is not the manager of one sector only, but it can transfer knowledge and resources within and *across* sectors through horizontal and vertical linkages beyond a single commodity. A pure CVC analysis would risk to neglect the political role of social actors by diverting too much the focus on technical aspects of the *governance*, defined as "the authority and power relationships that determine how financial material and human resources are allocated and flow within a chain" (Gereffi, 1994:97). The second reason is that informal institutions and power dynamics can be explained only by framing the technical operations of value chain complementarily with qualitative exogenous social and cultural elements. Economic agents cannot be analysed as acting under exclusive individualistic, profit-oriented and utilitarian behaviours in contexts where non-market relations and informalities co-govern social relations of production. Therefore analyzing food and cash-crops chains as closed coherent systems would miss the open-ended process influenced by historical political and geographical contingencies specific of each agrarian transformation. Nevertheless, in order to investigate the specific operationalization of production and the peculiar regulations of the commercialisation processes of each crop, some useful categories of the CVC literature will be adopted.

2.3 Modes of production in transition

So far we have overviewed the literature and theoretical underpinnings of the mainstream, NIE and CVC frameworks on commercialisation. It is believed that the definitions and explanations of commercialisation processes offered by the neoclassical and NIE contributions suffer of ontological, methodological and epistemological shortfalls because they over-simplify the dynamics of access and distribution to markets and assets. In fact, many of the studies which focused on the transition of crops production from subsistence agriculture to the market have often ignored the *causal* mechanisms of such processes being historically and socially blind (Patnaik, 2005). Also, the studies on commercialisation need to overcome the methodological individualism. By contrast, they should be embedded in their social, historical, political and economic context. Moreover, it has been pointed out how those analyses fail to acknowledge the multi-layered connections among production, market and consumption. In order to unpack the patterns of commodification and consumption of food, this analysis needs to start by looking at the specific set of institutions that determines the social relations of production and its changing factors. This analytical entry-point is

believed to be a condition *sine qua non* to understand the derived patterns of accumulation and distribution deriving from the commercialisation processes.

By overcoming the theoretical and methodological limitations of the approaches outlined above, this section will shed light on the political-economy framework, by introducing the concept of *modes of production* to analyse the transition to market-based capitalism. A *mode of production* is the unity of the 'productive forces' including labour, land, natural resources, raw materials, machineries etc., and the *relations of production*, meaning the social and technical structure that regulates the relations among humans in the production of the goods and services (Marx, 1869). Market transition creates new forms of commodities production and diversifies patterns of consumption. A new mode of production defines new divisions of labour, new competencies, powers and agencies in societies. Those are believed necessary epistemological passages of the present analysis in order to investigate the metamorphosis of crops, producers, markets and consumers.

The Marxist literature outlines that the capitalist mode of production and its intrinsic commercialisation process have often started by triggering mechanisms of expropriation and dispossession of the means of production, which initiated forms of primitive accumulation (Harvey, 2004). Many have studied such expropriation patterns under different modalities and circumstances such as during colonialism, in the pioneer forms of European or British capitalism with the enclosures and creation of property rights, and in the context of the former Soviet Union (Byres, 1996; 2003; Bennett et al. 2007; Brada, 1996; Akram-Lodhi and Kay, 2010; Harris-White and Heyer, 2010). Those transitions produced deeper division of labour through new forms of wage relationships and labour exploitation, *class stratification*, and *accumulation-driven polarization* of wealth. Food, as already mentioned, due to its material specificity, is one of the commodities that better explains the primitive social relations of production through the access to the physical (natural) means of production and by the same token, the alienation from the means of social reproduction. Not only, food can also help explaining and unveil the tensions between state policies and market forces.

However, modes of production are dynamic and can be overlapping (e.g. feudalism –colonial regimes) thus, it is fundamental to understand how capitalistic market penetrates and shapes pre-existing forms of markets by looking at pre-existing settings. In this thesis I will explore how in Uzbekistan idiosyncratic economic and political dynamics occurred as result of the interaction between the Soviet occupation, a centralized exogenous power, and the pre-soviet local Uzbek organizations, yet very powerful at the micro level. In this case study it will

be proved and argued that non-capitalistic modes of production are still in place. However, a slow ongoing transition to capitalism is in place, and it makes this case study a unique opportunity to analyse how such transformation is affecting dynamics of production, accumulation and consumption patterns, especially food. Labour passes from producing use-value to selling labour for its exchange value. The resulting division of labour creates a surplus value appropriated by the owner of the means of production. In this transition, food is accessed in the market via the mediation of money obtained through labour-relations. These processes are exogenous to pre-capitalist societies, yet 'necessarily' imposed for the formation of capital accumulation.

The transitions between different modes of production and the idea of combined forms of development of capitalism is supported by the empirical contributions which show overlapping, hybrid and articulated forms of labour exploitation, relations of production and accumulation, as well as consumption, as opposed to the idea of a linear transition. Banaji, analysing modes of production in the Indian context, confirms the necessity to investigate which are the modes of production characterised by specific *labour relations* and *structures of accumulation* rather than just assessing wage labour and purchasing power on goods in the market in an unhistorical way (2010). For instance, he emphasises that in merchant capitalism in India, traders were contributing to consolidate value in the circulation sphere complementarily to wage labour. In this sense merchant capital, although is not involved in the creation of surplus value, nevertheless is still subject to competitive markets and exercises control over supply sources and financial capital.

To be clear, in Marx, capitalism becomes dominant when a class of waged workers become free from property, and market mechanisms for capital accumulation become compelling both for the peasantry and new capitalists. Mentioning Lenin's "The Development of capitalism in Russia" (1964) Byres shares the belief that capitalism can and does develop also in backward societies (2003). Marxists define 'backward societies' as those societies which did not complete their process of industrialization and reach a complete capitalistic mode of production like advanced societies (Byres, 2008). Byres (2008) notes that the agrarian transition to capitalism has resolved the agrarian question, but this was not everywhere because non-capitalist modes of production persist in rural areas. Referring to the Lewis's conceptualization of growth, agriculture has multiple functions: it creates demand for industrial urban goods, and it provides a surplus for industrial investments, other than cheap food, labour and raw materials. Yet, Byres argues that the political and economic power of

economic transition is held by the urban bourgeoisies through a “long-drawn-out” process (2008).

Therefore, such complex transition requires a broad framework of interpretation which includes: historical roots, transformation of production within agriculture and outside of agriculture, the formation of classes and their patterns of accumulation and ultimately, the nature of the state. This research acknowledges the *role of the state* in acting as market regulator and in shaping agrarian *class differentiations* (Hart, 1989). It also acknowledges its role of market actor, namely as purchaser of agricultural surpluses and supplier of agricultural inputs (Byres, n.d.). The political economy framework is the only approach able to understand how market-based transformation creates and distribute wealth, resources and power, emphasizing the inappropriateness of the institutional and technical approaches such as neoclassicals and NIE discussed earlier (2.2.1 and 2.2.2). Indeed, so far many studies which have focussed on rural settings, have not produced analytical insights on for instance the benefits held by rich peasants and the mechanisms of redistributive effects applied by the state to patterns of consumption.

Lenin provided a model of three peasant classes: rich, middle and poor peasants, which were transformed into rich peasants and proletarian labour (Bernstein, 2009). Lenin argued that class inequalities reflect the different access to land and inputs. In this theoretical framework class analysis and class relations are central to understand the dynamics of capitalistic development and how accumulation outcomes and market forces are created and mediated. The drivers of class differentiation remain nevertheless context specific and are influenced by the infinite combinations of capitalist and pre-capitalist elements (Bernstein, 2009) which are inductively constructed and cannot be exogenously explained.

Contrary to Lenin, Chayanov (1966) argued that the Russian peasantry differentiation was not driven by class – as consequence of differences in land size and inputs access, but rather by the demographic cycle of the household and their different labour-consumer-ratio balance (Bernstein, 2009). He pointed out that in the family economy and in non-capitalist forms of production different non-market interests are included in the production’s decision such as subsistence leitmotif and self-exploitation (1966). However, he overlooked the major transformative forces under which farmers operate such as the imperative of profit maximization and competition in the circuit of commodity and capital accumulation (Bernstein, 2009). This underestimation of the analytical importance of profit in Chayanov’s argument is rejected by various agrarian Marxists, including the pioneer works of Kautsky

(1988), Engels (1950), Luxemburg (1968), Preobrazhensky (1965). Their analysis converge towards the idea of farmers' classes formation as result of a) commodification of labour (e.g. capitalists, petty commodity producers, subsistence or 'survivalist'); b) their modalities of accumulation; c) relations with the state and; c) social division of labour (Bernstein, 2009:10). In particular, the shared impression is that the dissolution of the peasantry, parallel to the process development of capitalism, creates a class of landless and urban workers which demand food.

Furthermore, Lenin saw the emergence of agroindustry as a form of capitalist development. Differently from large scale family farming which is based on low skills and low capital, food processing and marketing will enable vertical concentration which creates higher returns and triggers farm differentiation. How the food industry is articulated and managed in the market over time, how land becomes a commodity, and who manages financial capital has been the object of study of this strands of the literature (e.g. Ghosh, 2015; 2013a, 2013b; Bernstein, 2014; Byres, 2004, Akram-Lodhi, 2008). In conclusion, those are crucial analytical elements to identify patterns of production and consumption. These authors confirmed that the transition to capitalism through patterns of accumulation, production and political struggles is heterogeneous (Byres, 1991). Processes are not linear but nevertheless perceived as the necessary passage towards capitalist development. Such variances of paths keep feeding the debate on the agrarian question.

2.3.1 The Political Economy of commodification in agriculture

The previous section outlined the analytical platform and theoretical debate in which this research is inserted. This passage was necessary to understand how different strands of thought conceive, generate and interpret differently the same phenomena. *Political economists* have interpreted the paradigmatic shift from subsistence to commercialisation by acknowledging that, once means of production and their output abandon their *use function* and become market commodities, those are accompanied by complex forms of exchange and compulsion. Commodification passes through many phenomena and each case reads on a particular configuration of compulsion, change of modes of production and consumption. Through their outcomes we can identify different access to such commodities.

Marx, in describing the symptoms of capitalist production outlined that the commercialisation of production requires: labour power as commodity, realization of surplus

value in the form of profit, increase in productive forces through the expanding circulation of goods and services, and the creation of the proletariat. Nevertheless, other features are specific to agriculture commercialisation such as: the commutation of labour and rent in kind in terms of money, displacement of crop-sharing by cash-rent, a larger degree of monetization of inputs and outputs (in proportion) and larger proportion of land (or output) devoted to cash-crop, increase of landless labour (Bharadwaj, 1985:5).

Commercialisation, which can be also called commodification, is here defined as the process through which elements of production and social reproduction are produced for market exchange, typically starts with *commodifying* through the market 'some' means of consumption, then institutions of labours and its tools, then labour itself and finally land (Baraji 2010:102). As discussed in the previous section, those mark the transformation of the relationship of production and relationship of exchange, namely represent a shift from *use-value* towards *exchange-value* of the entire cycle of social production and accumulation, in which food is key part. The commercial expansion of capital operates in local forms of accumulation coming from the ownership and dispossession of the means of production (Baraji, 2010) which interacts with transnational trajectories shaping various forms of capitalism. The differentiation of the peasantry through capitalistic accumulation is considered as a model of 'accumulation from below' (Lenin, 1967). This process has been described as opposite to informal practices such as barter and in kind payments which, nevertheless, should not be considered as external to market forces. Indeed, as already mentioned, the presence of commercialisation processes does not mean that capitalistic market is completely formed and that it operates in isolation from other forces. Lenin advocates for the need to study what has survived despite the penetration of capitalism (1967 in Bernstein, 2009:6).

Looking at the benefits of commercializing crops, non-market transactions are considered to be counterproductive for capitalistic development for two main reasons (Thirwall, 2011). First, because money simplifies and speeds-up transactions, and second, because the full division of labour and specialization is impeded, productivity is wasted, thus accumulation is halted. In case money is not used as the main form of payment, accumulation will take place through assets rather than money forms, and thus investments will not take place (ibid, 2011). At a micro level, Fine underlines that assets acquired through credit can serve to enhance subsistence and create new sources of income and this process cannot be perceived as problematic a priori (2003). However, it is recognised that credit based on market

mechanisms exposes investors to risks and uncertainties. Political economists argue that the integration with the market would allow producers to capture the surplus-value generated from the sale of crops or create higher-paid jobs. Nevertheless, they are quite cautious in forecasting universally positive scenarios because of the intrinsic creation of losers and winners by capitalism through market competition. Hence, the nature of social relations in the market – namely with whom do market players have relationships, what is exchanged and how are the benefits distributed – is critical to understand who wins and who loses in the market (Oya, 2010c). This applies also in contexts where extreme market distortions are applied on land, credit, inputs of production and prices and money are not yet the main mean of exchange or compensation. The proportion and the scale of surplus accumulation given by such transition will depend on the specific conditions of material production which depends on financial power, market competition and resource (re-)distribution.

Furthermore, commodification can create unintended reverse effects, for instance when the underdevelopment of one capitalistic market inhibits the formation of another. In other instances it has been observed how the peasantry reinvested surplus production to hire more labour or to maintain subsistence modes of production (Carswell, 2003). This means that *surplus-value* has its own *use-value* that can be ‘executed’ in different forms giving space to different productive and consumption outcomes. It can be accumulated, it can be reinvested in technology or it can be simply consumed under barter, used for political interests, or exchanged without pass through monetary circuits or formal market channels. Hence, assets could take multiple directions in the process of production. Kennedy et al. correctly stated that an expansion of cash economy will not automatically substitute in kind transactions or payment, such as for instance food in exchange of labour or land (1994). In the case of West Africa, Oya observed that cash-crops groundnuts were retained for home consumption (2002). This confirms that the internal logic of each productive unit is not always explained by profitability.

Bharadwaj, looking at the commercialisation process experienced in India, indicates that commercialisation usually begins by commodifying the outputs first rather than the inputs of production, and it is boosted by transport links and internal market pull (1985). Another regularity outlined is that small-holder subsistence farmers produce mostly and primarily for self-consumption whereas the producers of food surplus engage in commodity exchange and enter in relationship with non-farmers buyers (Bharadwaj, 1985). Whereas the neoclassical assumption is that agents enter freely the markets, here it is argued that the nature of the

exchange depends on the production relations binding the two parties. Indeed, it is the individual's endowments that limits the scale of its transaction and the bargaining power within it. Therefore, different ownership positions may affect the nature of such relationships, i.e. access to land. It is also important to note that in many cases subsistence farmers experience commercialisation through compulsion. Small producers to eke for their subsistence would sell crops without having surplus (Bharadwaj, 1985). This shows that complex drivers explain the engagement with the market, which is not always seen as an opportunity but as a material necessity for ecological, nutritional or economic survival.

The rural market transition in rural China (in Zhang, 2015) provides relevant insights. Indeed, there the state acquires the surplus produced by rural producers while denying them the possibility of accumulation because of land right restrictions. Along such state-led capital accumulation, informal forms of land transfer and wage relationship shape new dynamics of agricultural modernization through the further "penetration of commodity relations" (2015:208). The state is here a manager and a market organizer, is identified as the agent of 'accumulation from above' which, through political coercion and absolute surplus value extraction (Lenin, 1967), shape farmers' stratification patterns and the pace of commercialisation.

As already mentioned, central governments can use the surplus created through agriculture to finance the industrial sector. For instance imposing tariffs and low procurement prices on the cultivation of cash-crops has been identified as a tool to drive economic transformation (Guadagni et al., 2005; Bernstein 1997). Indeed, in this research it is fundamental to acknowledge the role of the state as regulator and mediator of the market in two directions. First, because the state is a provider of social services such as health care, water, infrastructure, energy and technology especially in situations of remoteness and extreme poverty. Second, because the state shapes the dominant social relations of production by mediating the access to means of production, and by defining markets 'safety nets'. This thesis will treat the state as endogenous and dialectically defined *within* the market.

In conclusion, the literature has identified in the capitalistic expansion driven by profit (capital-money) and in the forces of accumulation (Patnaik, 2005), the universal and intrinsic rationale behind commercialisation process. However the literature put also weight on complementary factors that determine class differentiation, namely the role of the state in defining market forces. It is thus hard to identify a unique outcome of agricultural production from food to cash-crops. Such connection works differently in different regions, across time

and within farmers groups. Given the many potential variances of such process, this analysis will start by exploring who sells and who buys, what is bought and what is sold and how. In order to understand those patterns, it is necessary to understand who has access to the means of production and who does not. In this perspective, chapter 6 would grasp and discuss the ownership, access and use of inputs of production and outputs and where the role of the state stands in affecting those processes.

2.3.2 Labour and social reproduction in the process of agrarian commercialisation

The commodification of labour intrinsic to the commercialisation process entails the transformation of the scope and functioning of farm production and then food consumption (Akram-Lodhi and Kay, 2010). Yet, in agrarian contexts of the global South, characterized by seasonality of formal and informal productive activities and unproductive customary norms, the question of whether labour stay 'uncoupled' from the full form of capital accumulation is yet a relevant question to ask (Bernstein, 2008). In this research, labor is studied because it is untangled in different forms of productions, markets and remuneration. This complexity challenges the neoclassical understanding of labour as a mere input of production and reconnects it with the agency of consumer, dispossessed and exploited class in the social division of labour. Thus, this research inductively explores the differentiation of farmers and workers neither as homogenous producers of crops nor as homogenous consumers of food crops.

Farmers here are seen as supplier of labour, consumer of food-crops, producers of cash-crops and agents of change of the commercialisation and marketisation processes. In this section we look at the definitions adopted in the literature to classify and define labour. As empirical evidence has shown, there are many different types of farmers and each of them imply a different social relationship of production and market for crops (Bernstein, 2010:8). Bernstein (2010) distinguishes two types of stratifications of agrarian population: the first is spatial, namely the amount of land owned. The second is sociological because associated with the level of technology, capital and reliance on family labour which determines the competitive positions within the markets.

The simplest form of farmer is identified in the literature as *peasants*, or subsistence farmers or family farmers. They are usually producers of crops for use-value and dependent on their own labour for survival (Bernstein, 2010). Being inserted in a context of 'backward' societies, peasants have been described as being physically isolated, thus alienated from the decision

making process of society taking place in the cities. This type of farmers are inserted in a mode of production where the division of labour is not well developed, production and technology are not determined by competencies and technical specialization, but rather by personal relationship within the family (Bernstein, 2010). Cross referring to the debate on the inverse relationship outlined in section 2.2.1, neoclassical-populists have instead argued that small farmers, by exploiting family members through proximity and capacity control, are more productive than large-size farmers, exploit natural factor endowments and generate sustainable livelihood (Lipton, 2009). These have been considered sufficient conditions to trigger successful patterns of agriculture commercialisation in developing countries (Griffin et al. 2004; WB, 2013). However, political economists have criticized this analysis for its static approach in a context of transformation (Byres, 2003) and see peasants as the future reserve army of labour generated by the capitalistic process of dispossession, thus as potential proletarians and revolutionary agents (e.g. Kautsky in *The Class Struggle*). Therefore, this apparent unsophisticated category of farmers has been in reality the object of contested theoretical and political visions. From those interpretations, different analytical, and political connotations have been drawn.

Lerche (2011) recognises a complex picture around classes of labour and, by describing Indian rural labour markets, he stresses how it is necessary to clarify what labour is. In particular, specific modes of production create fluid categories of farmers who sometime own some means of production but are nonetheless obliged to sell their labour seasonally or throughout their lifetime (ibid). Indeed, owning a small plot of land and consume their output becomes undesirable in a situation where cash-crops allow to obtain cash to buy food. This scenario shows that the neo-populists approach neglects the obstacles that small farmers face to survive market competition because of the lack of economy of scale. Farming has to be often complementary to other productive activities such as local services or petty production and exchange. The 'opportunity' of accessing other sources of subsistence opens spaces for tensions among pre-existing and new class struggles (Bernstein, 2008). Therefore, when looking at rural labour, such complex processes need to be taken into account.

Furthermore, there is also a gender dimension which helps to challenge the classical assumption that households would uniformly respond to market incentives and maximize input efficiency. This is linked to the debate about whether cash-crop production can be instrumental to empower women, through for instance land access. In reality, empirical

evidence suggests that tensions on who manages and controls the use of resources, responsibilities with unpaid domestic labour and incomes hold strong effect on commercialisation and food outcomes (O'Laughlin, 1996).

As already mentioned above, commodification pushes the peasantry into proletarianization and wage labour. Commercialisation processes can lead to land concentration that, along with mechanization, could dispossess farmers and feed the surplus-labour outside agriculture (Leavy and Poulton, 2007). Through the modification of social relations of production, commodity relations affect the reproduction of family farming and living. Thus, there is an increased dependency to the market which becomes the arena where to both sell labour-power and buy food for subsistence. Such consideration requires a deeper understanding of how 'forced commercialisation' (Bhaduri, 1986) alter the division of labor at the individual level, outside and within the rural household, and in the national economy, being labor a variable which can diversify itself through different forms.

Class differentiation is able to unveil the degrees of separation between workers, means of productions and surplus value (Fine, 2009). The degree of separation helps to identify the extent to which the productivity increase associated with capital accumulation is appropriated by capitalists (as relative surplus-value) or by workers in defence of the value of labour power (which would imply higher levels of real consumption) (ibid 2009:2). Because there is no profit and price if there is no value and surplus value, Marx used wage labour as analytical unit to analyze capital-labour relations. The dynamics of labour exploitation along with the commodification of land, inputs and machineries made the rate of profit quantifiable (Mann, 2008). In this perspective the value of labour power, identified in the wage, is determined by the bundle of use value and by the power of workers in the relations of production which confutes the neoclassical misconception that wages equalise the marginal product of labour (Oya, 2001).

By the same token, situation of abundance of rural labor and tight wage-labor dependency can make the rate of return over exploitation extremely high, dis-incentivizing any productivity improvement through capital, and therefore perpetuating conditions of slow agrarian transformation and economic immobility (Bernstein, 2008, 2010). Not last, local powers and non-market relations would overlap and affect the integration to the global capital regime through commodity value chains. The mix between these two forces will result in symptomatic frictions between the centripetal, larger and stronger global capital forces

and the traditionally centrifugal and exclusive forces of local communities, now plugged into different patterns of labor structures, trade, consumer behavior, migration and surplus appropriation (Wolf, 2001). However, as I observe, the resulting outcomes is highly specific to the spatial and politico-historical context.

In sum, although commercialisation is embedded in specific pre-capitalistic institutions, it is crucial to know the pace and the patterns of the new process of capital accumulation and how surplus is reinvested. Trying to identify such dynamics in the relations of production, this theoretical perspective asks '*Who owns what? Who does what? Who gets what? What do they do with it?*' (Bernstein 2014:16). These questions will support the development of a socio-economic analysis of the classes of farmers. Previous classifications used for rural class differentiation in post-Soviet contexts will be analyzed in chapter 4 and in the methodological chapter 5.

2.3.3 Empirical exercises on class and commercialisation measurements

Across the political-economy literature I observed that commercial agriculture is recognised for having a) greater market orientation; b) higher productivity; c) increased labour demand; d) intensification of the requirements of delivery timing and quantity of processors or traders (Zhang, 2015 in Oya and Pontara, 2015). Also, an increased monetization of the circuit of production (Patnaik, 1990). Not least, the intrinsic rationale behind commercialisation process is the capitalistic expansion driven by profit and capital accumulation (Patnaik, 2005). In this section I look at how commercialisation in agriculture has been measured in different empirical exercises and through different methodologies along these categories.

Looking at the different variables discussed so far, it is known that higher degrees of commercialisation entail very often hired labour as opposed to family labour. According to this analysis, an increase in production pushes households into the exchange economy. An increase in sale will then increase gains to buy more food (Kennedy and von Braun, 1994:33). Equally, an expansion of the monetary form of payments and transaction indicates a higher commercialisation of the agrarian economy. Studying the impacts of commercialisation in Rwanda, von Braun et al. measured the orientation towards commercialisation from three different angles (1991). Firstly, he observes the extent to which farm households consume their aggregate output as compared with the value of total agriculture production. Indeed, it is sometimes observed how subsistence agriculture capitalises more on its input-side rather

than on the output-side, reinvesting the wages obtained in off-farm activities in the improvement of their subsistence production rather than diverting it towards monetised cash-crops. It has also been observed that commercialized farmers tend to rely less on 'own-made' inputs (i.e. manure or retained seeds) and acquire inputs from the market. A further criterion to assess commercialisation is through the expanded market exchange value as share of total income - and lastly the expansion of individual or household assets obtained through cash in relation to total income. Kennedy et al. develops these measurements of commercialisation at the household level (1994) as:

$$\text{Commercialization of agriculture (output side)} = \frac{\text{Value of agricultural sales in markets}}{\text{Agricultural production value}}$$

$$\text{Commercialization of agriculture (input side)} = \frac{\text{Value of inputs acquired from market}}{\text{Agricultural production value}}$$

$$\text{Commercialization of rural economy} = \frac{\text{Value of goods and services acquired through market transactions}}{\text{Total income}}$$

$$\text{Degree of integration into the cash economy} = \frac{\text{Value of goods and services acquired by cash transactions}}{\text{Total income}}$$

These *Crop Commercialisation Indices* (CCI) used also by Strasberg et al. (1999) have several limitations. First of all, in rural contexts where market prices are fluid and sometimes 'biased', value is very hard to quantify and monetize. Moreover, similar products can have different sub-values depending on the quality, quantity and seasons. Not least it does not differentiate between small-scale output production and large-scale (Leavy and Poulton, 2007). Therefore, scepticism needs to be raised vis-à-vis the meaning of value in those contexts. Very often in fact, rural production is characterised by situations of barter, informality and non-economic values which shape decisions and strategies. Thus, it is believed that to classify commercialisation according to static and exclusively '*productionist*' indicators is reductionist and limitative for the scope of this research.

Political economists have developed more sophisticated approaches. Byres, by investigating the social stratification of farmers as result of agrarian transformation and patterns of commercialisation, notes that characteristics varies over time, place and circumstances, and according to the degree of capitalist penetration (2003:243). Variables such as holding sizes, surplus and types of surplus, level of indebtedness, labour relations might help identify those socio-economic layers. He proposed an insightful distinction between *rich peasants* and

capitalist farmers. The latter are distinct from the former for their use of mechanised inputs, their relations with free wage labour, and their control over their surplus. Kitching notes that in agrarian economies the distinction between capitalist and working class is often an analytical abstraction and real categories are more complex where “the socially necessary labour time is extremely heterogenous” (1980:441-448). There might be a friction and overlapping between time-hired *in* and *out* (paid in cash and/or in-kind) and that spent in domestic productive and unproductive activities. Thus again, labour needs to be understood in its specificity.

Uzun (2009) classified farmers according to annual earning while other authors classified farmers based on land leased, rented or owned (Byres, 2008; Oya, 2004). Pallot et al. (2004) suggest going behind the classification of farming according to land size because it does not explain how farmers capitalise or perform and the institutional constraints they experience for their accumulation. Kitching underlines that differentiating farmers by the scale of land is unhelpful as it hides different bargaining powers in the fight for resources (2004). In general, land is seen as one key variable to understand the expansion of the private capital within the market. However, accumulation through land can be subject to restrictions by the state thus land can be a false measure of wealth. In the case of China, very useful for this case study, Ye et al. (2009) show that patterns of farmers’ accumulation cannot be explained only through economic access to assets and land but also through social networks and affiliation, information and reputation, being these conducive to immaterial wealth, benefits and reciprocities.

Challenging the example of Amin and Abdel-Fadil who classified Egyptian farmers based on land ownership size, Byres (2003) noted that, to study transition economies, it is important to look at which type of labour, i.e. family labour versus waged, is employed, but also what are the source of food provision for the household, which brings in a different ‘use’ of money and of the market exchange. Very often indeed Marxist political economists admit that family-labour enterprises have ‘value and virtues’ in common (Bernstein, 2010) or that labour wage relationships can be based on a set of personal relationships and values (Byres, 2003) and non-price factors matter in the power equations (2003:245). Yet, farmers rely on and accept even very low wages to survive.

Instead Chayanov (1966), as we mentioned earlier, argued that the degree of engagement of family labour in wage work depends on the family consumption demand. Furthermore, it is important to say that the use of hired labour is not confined to higher classes because,

especially during the harvesting season, also poor peasants hire labour. In sum, the nature of labour within agriculture makes its use subject to seasonality with periods where there is strong competition for workers and periods where labour is not needed. The fragmented and casual contractual formula is therefore subject to strong power relations and very hard to assess in its patterns (Oya and Pontara, 2015 chpt.1). Wage labour is therefore an additional crucial variable to understand how market mediates production and consumption.

Das (2010) uses Patnaik (1999) 'exploitation index' to assess the use of labour outside the household versus the extent of self-employment for class formation in India. The formula is: (Labour days hired on the operational holding of the household) – (family labour hired out of others) + (family and hired labour days used or leased out land) – (labour days similarly worked on land leased in by household) all of which divided by labour days worked by the household in its operational holding. She found out that the higher form of exploitation is when labour is sold rather than when it is self-employed. Therefore, the labour hiring criterion can be a tool to divide farmers in exploiters of labour power, exploited or self-employed. As further variable, vast emphasis has been put on the capital/labour ratio as an indicator of agricultural transformation. Therefore, it can be observed that most of the literature which has looked at how inputs can define and explain differences in commercialisation has nevertheless focussed mainly on use and access to means of production such as land, labour and capital (or technology).

Oya (2004:18) created a taxonomy of 'degrees' of classes to explain agrarian change in Senegal. He criticises rigid and static approaches of classification, and building from Patnaik's exploitation index, he developed a set of multidimensional criteria based on: a) capital endowment/access to means of production (powered equipment and assets e.g. light and heavy machinery, transport, animals); b) land productivity in value (profitability) and waged labour hiring; c) proportion of marketed output. He thus combined technological capacity/intensification with patterns of land use and ownership; education of farmer and children; surplus use patterns (balance between consumer durable goods and means of production) (2004:20). The means of production are indeed key indicators to assess the degree of commercialisation and dependence of producers (Von Braun and Kennedy, 2004).

Chapter 6 draws on similar methodology to explore the combinations of inputs, outputs and assets to understand classes in Uzbekistan. It is here argued that class stratification and commercialisation are dialectically shaped and informed, both ontologically and at the

normative level. In particular, process of commercialisation cannot be studied without looking at class analysis. Accumulation indeed depends by whom and how surplus value is created and appropriated (Das, 2010). As consequence, commercialisation, by informing process of accumulation, contributes to shape class relations and vice versa.

In conclusion, commercialisation and specialization of production is studied by neoclassical literature through similar variables but in symmetrically opposite theoretical viewpoint with respect to the political economy approach. Indeed, Van der Ploeg (in Fine 1994:13) states that there is a puzzling convergence in the development theory on commoditization and neoclassical development economics. Both of them are interested to investigate the impacts of commercialisation but from different epistemological perspectives, namely one through the rational individual, the other through class and power relations. Mainstream literature sees commercialisation and market integration as an opportunity, and it focuses on studying the frictions which impede a further market-orientation. In this perspective market is the arena where efficiency takes place, benefits can be equalised and transaction costs can be resolved. Those prescriptions are based on the principle of natural comparative advantage, market efficiency in allocating resources, profit maximization and individual rational behaviours. However, this strand of the literature does not account for non-linear, non-profit driven and non-rational decisions on production and consumption preferences, both at subsistence or commercial level and both at individual, household or national level. The PWC acknowledges the failure of the market but still sees it as the central driver and enabler of growth and development. The Marxist political economy strand is interested in studying how the capitalist mode of production triggers mechanisms of commodification through power relations and class struggles, it embeds the analysis in its historical and political context, and explores which are the intrinsic social and economic asymmetric outcomes.

To conclude, across different perspectives, it has been widely acknowledged that the passage from traditional farming versus commercialisation (or from food-crops to cash-crops) is never 'just a switch', and multi-directional asymmetric relationships need to be taken into account to grasp the dynamics around market transition. Also, considering the material limitations to capital expansion of agriculture, the analysis must assess the operational mechanisms through which commercialisation of inputs and outputs occurs, and the complex outcomes that arise. In the next chapter we are going to explore how agrarian market transition embroils food consumption.

Chapter 3: Agrarian production, markets and food provision

So far I have discussed the theoretical underpinnings behind the productive and commercial transition in agriculture. Because it is argued that food is key in understanding the processes of market transition, it is now fundamental to discuss how the commodification of agrarian production and distribution would affect the availability and access to food (Hawkes, 2006). Here food consumption is understood as the outcome of various determinants and layers of analysis: first the household, which has the responsibility of providing food for its members and it decides what to buy, exchange or produce; second, the market level, being the venues where local, national and international price and availability are defined; third, the state which acts as mediator and regulator of commodity exchange. Food consumption is indeed shaped by policies and regulations which affect the quality (what and how) and quantity (how much) of food produced and then consumed. This chapter will critically engage with these factors.

3.1 Problematizing food security

As this thesis looks at how the transformation of social relations of production in agriculture influence diet quality and patterns of food consumption, before entering into the merit of the analysis, it is important to identify and discuss the definitions around which the theoretical and policy debates on food are constructed. I now observe how the conceptualization of food security and healthy diets are at the epicenter of an evolving contested debate in theory and policy practices, and how such different approaches are embedded in particular political-economic narratives.

Food Security is generally defined as the sufficient access to quality food which respects cultural and social practice. According to the 1996 Declaration on Food Security of the World Summit “Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”. FAO further states that, based on this definition “... four food security dimensions can be identified: food availability, economic and physical access to food, food utilization and stability (vulnerability and shocks) over time” (FAO 2013, p. 17). Each dimension is assessed through specific indicators in relation to supply and demand (ibid). In the early 2000s the nutritional-individual dimension became an integral part of the concept of food security (FAO 2009, p. 1). Food security became also a human right, yet remaining a technical concept which does not assume a political connotation and does not challenge market mechanisms.

Malnutrition is a broad term which unveils that food-related problems are multidimensional. It encompasses cases of under-nutrition, seasonal and hidden hunger, as well as over-nutrition or obesity and non-communicable diseases (IFPRI, 2016). Those are not mutually exclusive. People are undernourished when their diets do not provide enough calories. However they can be malnourished when they lack adequate varieties of proteins and nutrients for growth and maintenance, both macro and micro, or when they are unable to absorb their food intake due to illness (ibid). In rural contexts often exists an additional phenomenon called seasonal hunger, which is a predictable and temporary annual 'hungry season' which household expect, plan for and often cope with by adopting a variety of adaptive responses (Devereux, 2010). Malnutrition concerns also overconsumption of calories (Salois et al., 2012). Lastly, dietary diversity is defined by the varieties of food types consumed in a diet in a certain period, classified according to the variety of the nutritional components they cover.

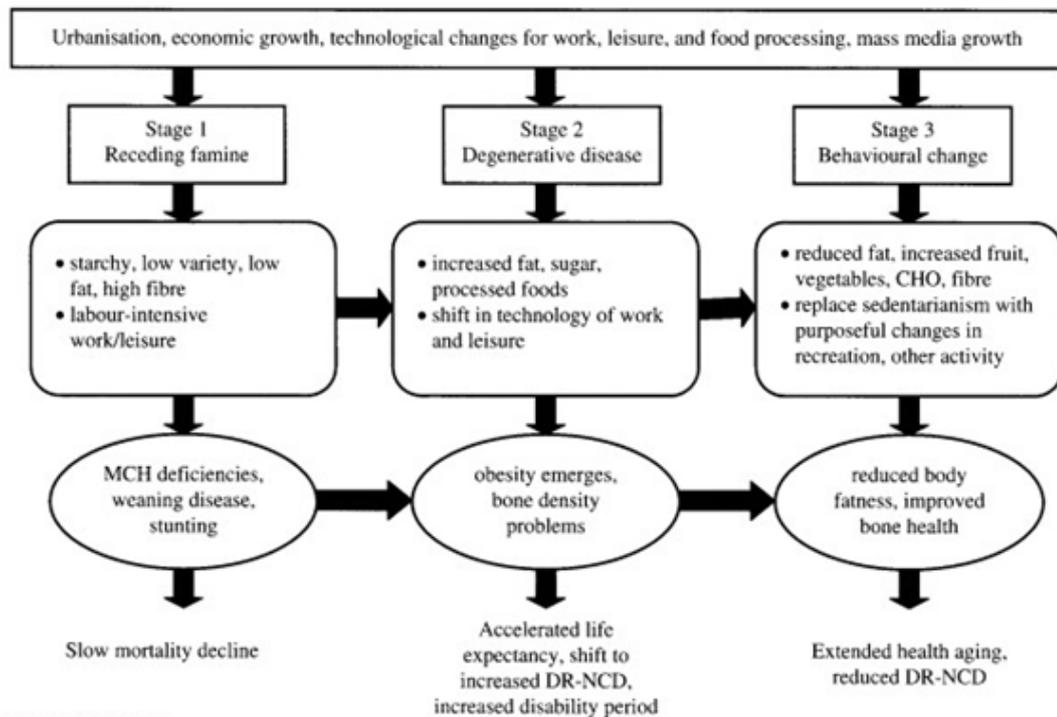
In this scenario, food security and dietary diversity are determined and studied through individual nutritional outcomes (Arimond and Ruel, 2004). Policy makers and experts recommend that carbohydrates (present in many staple crops such as rice, wheat, potatoes and sugar) should occupy 55-75% of diet, fat (animal fat such as butter, seeds oil² and oily fish) between 15-30% and protein (animal meat and milk, legumes) 10% with more than 400g per day of fruits and vegetables (Waage, et. al. 2010). Healthy diets should comprehend at least 20 essential micronutrients including protein, essential fatty acids, and micronutrients and limited use of alcohol (Burchi et al. 2011). Therefore, both definitions and indicators suggest that malnutrition has been predominantly studied at the level of individual consumption, and often simplistically identified with a lack of dietary diversity. However, the determinants of such outcomes are more and more complex. Therefore, the broader supply-related mechanisms and the underlining structures linked to production and market distribution have to be included in the analysis.

The *nutrition transition* framework helps expanding the contextual policy space of those narrow definitions. This approach asserts a linear direct relation between changes in diets and the economic growth of a country (e.g. Popkin et al., 2012). In particular, the nutrition transition framework argued that local diet in developing and emerging countries, e.g. China, India and SSA, gets influenced, re-balanced or disrupted as result of agrarian and

² n-6 polyunsaturated fatty acids; n-3 polyunsaturated fatty acids

food commercialisation, urbanization, growth, technology and liberalized trade (Pingali, 2007; Popkin, 2003). In particular, economic growth leads to a reduction of famine and to a shift of consumption preferences induced by westernized dietary styles, namely from minimally processed food based on cereal and staple food to oils, sugar, fats and industrially processed food and prepared meals. Those kinds of food, because tend to have high content of refined sugar, trans-fat, and sodium, increase the problems of obesity and other non-communicable diseases (Baker & Friel, 2014; Hawkes, 2006; Popkin et al., 2012)

Figure 3.1- Stages of the nutrition transition



Source: Popkin, 2002

Economic transformation is here recognised for being an important driver of changing diets which are increasingly dis-embedded from locally-sourced ingredients and, induced by market forces, increasingly converge towards unhealthy habits (Hawkes, 2012). This framework suggests that higher income does not lead to healthy diets in the first place. Indeed “Evidence suggests that as incomes rise household expenditure on food increases because more expensive food is purchased, but the nutrient content of these foods does not increase proportionately” (Salois et. al., 2012:5). Even although malnutrition can be ‘a reflection of poverty’, Behrman and Deolalikar (1987) found that an increase in income does not lead to nutrients intake improvements, although food expenditure increases substantially. Although this approach has contributed to the literature by systematising conceptually how global restructuring of large-scale agri-production causes changes in diet norms through new

food distribution and marketing dynamics (Hawkes, 2006) however, it has some shortfalls. Indeed, it does not explain the divergences of patterns at the global level. Also, it does not discuss how both market and non-market mechanisms affects dynamics in the food supply chain. Moreover, the diet transition framework does not grasp the differences in powers and inequalities in food access between poor and rich and urban or rural divides within country (Hawkes, 2006).

Nevertheless, in other studies market expansion has been recognized as a driver of food security, being conducive to higher revenues and returns for producers through productivity enhancement and therefore growth (von Braun and Kennedy, 1986). In this perspective, for both food producers and consumers, purchasing power increase has been identified as the determinant of good nutrition because it increases the household or individual ability to buy food (von Braun and Kennedy, 1986; Komarek, 2010). Much in line with the neoliberal framework, food access, quality and adequacy, hence food security are simply conditional to income (Jarosz, 2014). However, such uni-dimensional understanding of the relations between income and nutrition is rather simplistic. It reinforces the rationale behind the discourse that food acquisition is an objective that has to be resolved and achieved at the individual (consumer) level and through the market, without exploring the broader systemic economic and political dynamics which explain why and which kind of (unhealthy) food is produced and which are the mechanisms that dictate its distribution (Jarosz, 2011). Indeed, looking back at older definitions such as the one developed at the World Food Conference in 1974, food security is described as the “availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices” (Shaw, 2007). Although the condition of ‘adequacy’ is limited to basic foodstuff, thus quite limitative, it is nevertheless clear how the emphasis has switched from national production and availability (supply), to individual capability of acquiring food (demand).

Indeed, recent food security policies and methodologies within international organizations have been developed under such individual-centric conceptualization. For instance, it is observable that the promotion and dissemination of *guidelines* it is increasingly in vogue to increase the awareness and education of consumers on nutrition (i.e. WHO) and to promote *variety* in food consumption. Awareness and knowledge are seen as both the causes and solutions to malnutrition. Nevertheless, this solution actually reinforces the ‘*individualization*’ of responsibility of good nutrition and neglects the mechanisms around economic processes

which, by transforming the relations of production, determine and shape food supply and consumption, in particular through the alteration of the quantity, types, and desirability of food (Hawkes, 2006).

In sum, although it is necessary to understand the individual outcomes of food consumption and how these are determined by income, this analysis must also look at the different scales (i.e. micro-meso–macro) and multiple dimensions of supply and demand. In particular, chapter 7, by overcoming the concept of ‘calories adequacy’ as indicator of nutrition, and unpacking the meaning and tools to study dietary diversity, tries to understand why certain food types are consumed or not. I will also discuss the epistemological and normative limitations of studying quality diets through dietary diversity. Chapter 9 deals instead with the broader systemic analysis of patterns of food and non-food crops production and how the role of the state, in particular through trade and fiscal policies, affects the interaction between production and consumption.

3.1.1 The relation between crop commercialisation and food consumption

Having acknowledged that food consumption has to be analysed in a multidimensional way, it seems necessary to investigate empirically the relations between agrarian production and food consumption. Linkages between commercial agrarian production and food consumption represent a thorny nexus, and the scenario becomes even more complicated if the dimension of diet quality is added to the analysis. Looking at the debate on the impact of market integration in low and middle-income countries, a strand of the literature acknowledges a direct transmission between the increase of agricultural commodity trade and poverty reduction, which, due to the increase in income, improves food security (Cramer et al. 2014; Pinstrup-Andersen, 1982). In this approach, trade leads to convergence, price equalization, cheaper food due to competition-driven forces (e.g. Bhagwati, 2004). However, another wide strand of the literature has a more sceptical position on agrarian commercialisation, and it blames it for being a cause of malnutrition (Woodhouse, 2011; McMichael, 2006). In this section, we will explore the empirical and theoretical implications of market integration for food consumption. Given the proliferation of cash-crops in developing countries as result of their export-oriented agricultural policies, wide empirical research has been developed in the 80s and 90s around the effects on nutrition of such productions.

Many authors underlined how complex linkages can affect the relations between production and consumption, including time, income, labour relations and distribution of resources (Von Braun and Kennedy, 1987:15). Looking at specific case studies, outcomes have been

contradictory. Studies on Sub-Saharan Africa or South Asia have tended to focus on the impacts of household income's increase and labour on nutrition, because income is believed the fundamental driver of diet quality. Indeed, poor people tend to consume mostly cereals or poor 'staples' food, considered poor in micronutrients (Bouis et al., 2011a). By the same token, when food prices rises, consumers shift their income towards calorie-intense food because generally cheaper than animal or plant-based food. In both cases protein food consumption is positively associated with income. The seminal study by von Braun *et al.* (1989) showed that the shift to commercial and irrigated rice's cultivation in The Gambia had significantly positive household income effects which translated into improved calories intake for children and women, and underline the importance of productivity enhancement to ensure good nutritional levels. Bouis and Haddad (1990) show that the expansion of sugar production in the Philippines had impacted positively on access to land, income, schooling, and morbidity. Other recent studies have found that households that dedicate larger share of land to commercial crops have greater dietary diversity (Webb, 2014).

Another argument in favour of commercialisation as driver to food security is developed by Otsuka and Yamano, based on historical data in Asia (2006). They assert that the intensification of production (i.e. Green revolution) is a necessary step to improve *human capital* (education) and the participation in non-farm activities is considered a pre-condition for better nutrition (Hoddinott and Wiesmann, 2010). It is noted that commercial agriculture requires wage labour which, by generating income, will improve household food-security (Martens and Swinnen, 2007). This narrative explains that food security is 'automatically' reached through market mechanisms. It is also emphasized that, if a food system is successful in creating income and avoiding malnutrition, it is not important to look at which type of crops are cultivated (Timmer, 2009).

Trying to explore other causes of malnutrition, a key point raised by the neoclassical literature is that malnutrition is a consequence of inefficient supply, explaining food security as a problem of volume –or productivity- of food production (FAO, 2011; 2013). Fafchamps et al. (1998) state that food market integration, promoted through improvements in transportation and intra-household arrangements, would reduce staple food price variance as well as expenditure elasticity. These changes will create the conditions for farmers to divert inputs towards cash-crops. It is argued that, if food crops will be produced at a commercial level, prices will decrease and they will become more affordable. In this view, food security will be boosted if food market will be integrated and technology innovation will

spill-over from cash-crops to food-crops. Technology would increase yields and through income, register high calorie intake. In the Malawi case for instance, Dorward et al. (2006) argued that specializing in cash-crops can entail a composition effect and will not automatically act in substitution of food-crops, thus an expansion of cash-crops can coexist with subsistence production. These case-studies have emphasised a positive link between commercialisation and food security. However, deeper structural causalities which determine historical and political outcomes are not investigated, and neither the resulting economic implications that affect food outcomes.

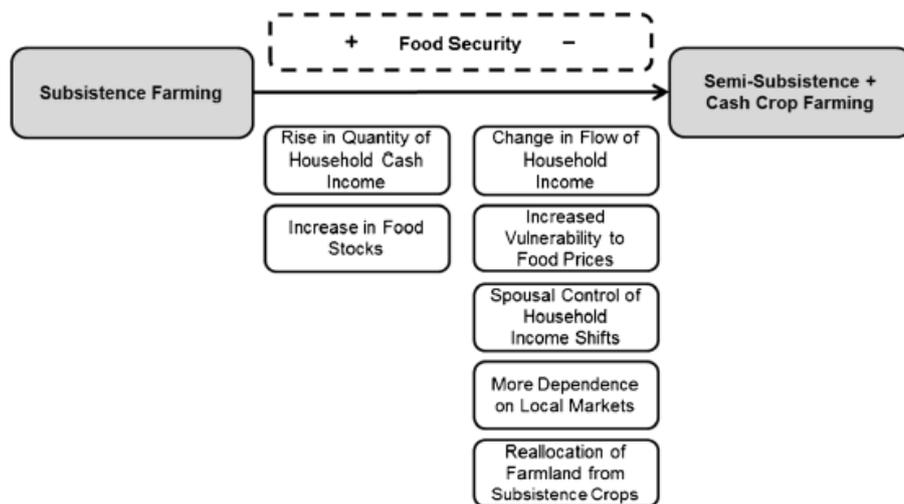
Yet, the relationship between commercialisation and food security can be interpreted also in the other way around. Namely, once food security is reached, it can reinforce processes of commercialisation. Food security is in fact a pre-requisite for enabling producers to start a process of diversification from the exclusive production of staple-crops, and that is particularly true in situations of 'inefficient' food markets (Leavy and Poutlon, 2007). Therefore, those two dimensions can be seen as in a circular process. In this perspective, it is necessary to investigate which are the drivers of food security beyond income and supply.

Indeed, other case studies have shown negative relations between cash-crop production and food security. Von Braun and Kennedy (1994) show negative nutritional consequences on the poor and on children as result of shifting to cash-crops. Looking at ethnographic works on the relationship between cash-cropping and food security, O' Laughlin (2013) argues that the introduction of cotton in Mozambique created competition of intra-household labour between cash-crop and food-crop resulting in negative impacts on nutritional status for children and women. In particular, cash-crop cultivation increased the workload for women which affected the distribution of time between productive and reproductive work, with negative consequence for food consumption (O' Laughlin, 2013). Therefore, commercialisation affects differently gender and labour relations. Shifts to cash-crops change the configuration of household labour and access or distribution of assets.

Looking at mixed methods works, in Ghana Anderman et al., (2014) found significant negative relationship between production of cash-crops, namely cacao and palm oil, and food security. Food security was tested through food availability (adequate amount of food over the year), food access, measured through the coping strategy adopted, and food utilization, measured through dietary diversity and anthropometric measures. They argue that cash-crops increase dependence on market supply and prices of food and it increases vulnerability to risks and

shocks (see Figure 3.2). Thus, cash-crops can exacerbate income volatility through the reliance on local and/or international market prices (von Braun and Kennedy, 1986). Also, in many rural societies food-crop is generally managed by women whereas cash-crops involve more male labor. Hence, a crucial driver of food access and therefore decent nutrition is the control over household revenue and decisions on spending patterns. In particular, women might play a fundamental role in shaping agricultural and food practices in ways that affect health and well-being (Pritchard et al., 2016). It is indeed argued that mothers and children's health, improved through access to water and sanitation, might strongly affect nutritional outcomes (WHO, 2013).

Figure 3.2- Sources of vulnerability on food access, availability and utilization through cash cropping



Source: Anderman et al. (2014)

In the case of Guatemala, Immink and Alarcon (1991) found out that small farmers who diversified their crops by adding cash-crop potatoes experienced a decrease in income, food insecurity and nutritional deficiencies. By contrast, large farmers who also differentiated their crops with potatoes, although they increased their available income, did not experience a significant improvement in their nutritional status. Thus, in this case, cash-crops had negative or no effect on nutrition quality. Hawkes found that export-led production of soybean in Brazil did not correspond to an increase of national food consumption per-capita (2006:5). Also, in the case of tapioca's commercialisation in India, which was introduced for environmental reasons rather than because of market liberalization, Finnis (2006) found negative consequences in terms of debt cycles, income decline and dietary diversity. A further observation is that cash-crops, if linked with income rise, has been associated with increased consumption of processed industrialized food. Therefore, an increase in income can have

inverse effects on nutritional outcomes (Hawkes, 2006). Not last, the mechanization and innovation process intrinsic to commercialisation can create a competition effect with labour demand and therefore affect the income of labour.

Angeles and Hill (2009) understand agrarian transition (or commercialisation) in the form of rural class differentiation, use of new farm technologies, rural-based industrialization, and new institutional arrangements. They also underlined that the gender dimension of the agrarian transition has been poorly explored by academia working on the agrarian question (ibid). In particular, it is observed how so far the women's role in agrarian commercialisation has been studied only around the concept of 'feminization'. Women have been integrated in development strategies as if they were a 'dummy variable' similar to technology or credits. However, in a context of state-led industrialization and economic transformation, it cannot be ignored what actually happens to gender roles through the reconfigured division of labour. Hart notes that women access non-farm jobs, land and means of production differently from men, which are shaped both by state policy and by the changing economic local dynamics (1991). 'Womanhood' holds a functional role both within and outside the household as housewife, bread winner, and mother (ibid). Kabeer (2003) noted that women's work is fundamental for the survival of the household, if not in monetary terms at least by supporting the male participation in the labour market, by managing the household's assets and delivering domestic services such as meals and facilities. Furthermore, women assume an important role in the process of commercialisation for instance by selling on the side of the streets small surplus of agrarian output. However, women face institutional, social and cultural barriers to access power and capital (Kabeer, 2003). Gender is therefore a critical factor to understand the processes, mechanisms, causes and consequences of agrarian change (Angeles and Hill, 2009:7). Even if this falls beyond the scope of this research, this study provides insightful starting points for reflecting on the transformative forces that agriculture commercialisation exercises at the intersection between gender and classes of farmers.

3.1.2 Understanding food consumption

In view of this discussion, as Sage argues, "it is necessary to reformulate prevailing conceptions of food security to permit a theoretically-grounded framework capable of accommodating multiple levels of analysis" (2013:4). To assess food security, Pinstrup-Andersen (1982; 1985) identifies the causes of malnutrition into four factors associated both with supply and demand. *Food availability* assesses whether there is a sufficient supply of

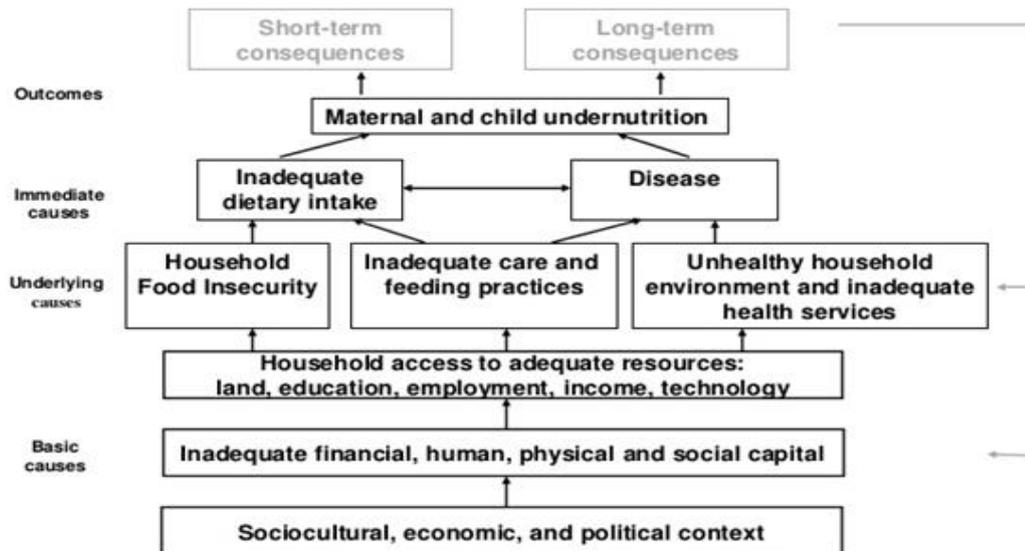
food within the market and how prices affect the access to food. In his consideration, food availability relies on the macroeconomic principle that, in a situation of liberalized trade markets, if cash-crop production is based on the competitive advantage of a given economy, this will be able to provide enough returns in cash to finance the import of the needed food. The amount of foreign exchange used for this purpose depends however on the specific development strategy, internal demand, and state investments (intervention) at macro level. I will discuss this in section 3.3.

The other three determinants of malnutrition are linked to the ability of the household to produce or *access* food, to food *preference*, and lastly to the intra-household food *distribution* (1982:46). Those indicators reflect and expand on the microeconomic concepts of affordability, access and distribution. These three dimensions unpack the demand for food and touch upon the social and institutional micro aspects related to malnutrition. One of the most cited negative consequences of commercialisation on nutrition insecurity is the fact that, as already mentioned, diversions from subsistence food production can expose households and farmers to market risks and price and supply volatility. At the micro level, an increased commercialisation of agriculture can affect the capacity of the household to acquire sufficient food by affecting short-term consumption. Nevertheless, the root causes of the asymmetries in accessing capital and labour and what drive food production and consumption are still not sufficiently explained. This research tries to investigate food consumption based on the underlining assumption that the process of commodification and market integration trigger different forms of differentiation and stratification which entail consumption inequality at best, and exclusion at worst. Thus, a policy that mitigates and filters those risks seems desirable to avoid that the sole market forces define food access.

In sum, the relationship between agricultural production and food security is very complex since it involves production patterns of availability, price, and distribution of food commodities (Turner et al., 2013). Moreover, it has been emphasised that income elasticity of calories consumption is very high on the very poor but few evidences are available to assess the effects of income increase or when non-income factors come into play (Hoddinott and Wiesmann, 2010). In conclusion, food consumption depends on economic and non-income factors which relate both to the demand and the supply for food, outside, and inside the market. For instance, the UNICEF framework (Figure 3.3) shows that multidimensional short-term and immediate causes of inadequate dietary intake and disease at the household and meso level are linked to underlying and basic causes related to broader economic factors such

as unemployment and political instability. Not least, there are further macroeconomic conditions such as the risks of inflation, supply availability, and saving-investments frictions that are important for the success of the cash-crop sector (Webb, 2013). In conclusion, income is a crucial factor but contextual multidimensional aspects linked to public policies and demand also matter.

Figure 3.3- Multiple causes of maternal and child under nutrition



Source: The Lancet, 2008

In conclusion, there are multiple possible 'nutritional outcomes' in different regions, and there is a fine balance between specialization and self-sufficiency (Haddad, 2002; 2013). *Substitution* effect, *competition* for time (labour) and space (land) and accumulation pushes driven by market competition and efficiency gains (profit versus subsistence), but also gender and class have been identified as main factors that intersects in a non-linear way and at different scales in each case study (Von Braun and Kennedy, 1986; Fafchamps, 1992; Maxwell and Fernando, 1989). Therefore, there is not a unique universal answer about whether cash-crops and food-crops may hold an intrinsic friction (Leavy and Poulton, 2007). This might depend on the structure of the economy, on its policies, the eco-system, and crops types. Multiple interactions between food and cash-crops productions are driven by changes in organization of agricultural production which affect market relations, income sources through rural differentiation: for instance, on technology/input sharing, labor use and land use at national level (Bernstein, 1977).

Anderman et al. (2014) for instance underline the fact that in many cases smallholder farmers do not engage exclusively with subsistence production or with cash-crops but very often is a combination of both. They indeed engage in a regime of semi-subsistence, defined here as producers who produce both for subsistence and for the market (De Boer and Chandra, 1978). Subsistence crop production, semi-subsistence and cash cropping are in many cases fluid and overlapping realities. These relations of production occur in contexts where very often the capitalistic mode of production are not completely realised. Moreover, even in a situation in which income disposal increases because of cash cropping, the adequate quantity and quality of the diet will depend on the type of products available on the market (Von Braun and Kennedy, 1986). If the market supply remains insufficient or inadequate, food access and provision will suffer. Moreover profit from cash-crop can be highly seasonal and income volatile which might lead to the fluctuation of purchasing power to buy food. This relates to the debate emphasised in the previous section which outlined how income can be, but not exclusively, the driver to higher quality diets because broader factors play a role.

As explored by Pinstrup-Andersen, (1982), national and household food consumption and diets depend on economic, institutional and socio-historical factors that affect the quality, quantity and affordability of food (Burchi et al. 2011). That is why it is important to investigate the productive and non-productive socio-economic relations of production to understand the underlining dynamics of food availability, access, and use. This case study would provide a further prism to shed light on which factors play a role in the relationship between agrarian production, the market, and diets.

Based on this review, this part of the research aims at investigating the relation between agrarian production and food consumption at the micro level. After having developed a class analysis in chapter 6, in chapter 7, through individual dietary diversity index and other variables linked to food security and access, I identify and map different patterns of food consumption and see whether different agrarian producers, because of their different relations of production, are exposed to more diverse food consumption patterns. The rationale of the methodology adopted will be discussed in chapter 5 and 7. In the next section, I untangle the theoretical debate developed about the linkages on commercialisation, crop diversity, dietary diversity and wealth.

3.2 An interpretation of the commercialisation–food nexus

So far I discussed the relevant analytical, theoretical, and empirical categories to understand and investigate agricultural commodity production and market structure and how these

impact on food consumption. Within the literature, different authors belonging to different strands of thought and disciplines have underlined the multifaceted linkages between agricultural production and malnutrition and have explained them in different ways. In chapter 2 and 3.1.1 I show that both policy makers and theoretical prescriptions have focused on commercialisation and cash-crops as instrumental for farmers' welfare, health, education income and ultimately food access (i.e. WB, 2008; Thirlwall, 1986; Poulton and Dorward, 2006; Collier and Dercon; 2013, Haddad, 2013; Oya, 2007).

However, I acknowledged that social relations of production are extremely relevant to determine consumption patterns, together with non-market, cultural and social factors. Furthermore, I have seen that case-studies shown a complex picture and the results on whether and how commercialisation affects food security are contradictory. Although various disciplines underline the importance of the agricultural sector as food provider for nutritional outcomes (Carletto et al. 2015) they recognise that agricultural commercialisation is not a neutral process (Turner et al., 2013). Mechanisms regulating agrarian production and commercialisation processes and its effects on diets on both producers and consumers are not univocal (Jones et al., 2014:1) and evidences are poor (Turner et al. 2013; Webb and Kennedy, 2014).

By trying to assess the linkages between agriculture and nutrition, authors underline for instance the importance of considering the role of inputs (e.g. technology, fertilisers, and seeds). Also the role of the intermediary stages along the value chain such as distribution, storage, processing, retailing have to be considered when looking at the impact of agriculture on diets (Turner et al. 2013). Ultimately, the lack of food can also be caused by exogenous or broader phenomena such as droughts, economic downturn, landlessness, unemployment, balance of payments disequilibrium due to food import or rise in international borrowing (ibid). Hence, wider institutional, economic, and political mechanisms can affect food security outcomes. Due to the complexity of this nexus, it is important to discuss further how the literature has investigated such relationship both at the micro and macro level.

3.2.1 Commercialisation versus crop diversification?

In this section I explore further the mechanisms involved in the process of commercialisation which would contribute to explain further the dynamics of market-oriented versus subsistence production and the implications for food security. One aspect of commercialisation which recently was increasingly investigated in the literature is the

relationship between agricultural commercialisation and crop diversity. It has been argued that commercialisation diverts agrarian production from a mix to a more concentrated set of crops at the cost of crop diversity (Leavy and Poulton, 2007). This dynamic is based on the competition effect of space and labour outlined earlier. High levels of crop diversity are indeed often associated with extensive agriculture, devoted mostly to subsistence needs and which have low yields and low returns, thus slow growth.

Market integration entails instead a specialization of crop production and therefore a decrease in the number of crops produced. Intensification, profit maximization, and economic efficiency in capitalistic production entail economy of scale, a sophisticated social division of labour, and accumulation via expansion and replacement via dispossession of less market-efficient crops. In some African contexts various authors denounced the need to move away from staple crop production towards more productive and remunerative cash crop (Fafchamps, 1992). It is argued that export-oriented mono-cropping could compensate the lack of access to diversified set of crops through the income generated from the sales of the cash-crop (Jacques, P. J., & Jacques, J. R. 2012). However, in India and sub-Saharan Africa, the expansion of commercialized agriculture has often displaced cultivations of important food crops, source of nutrients such as millets, greens and pulses, with negative implications for food security and quality diets (Jones et al., 2014). Despite the maximization of revenue and yields coming from cash-crops, such conversion might indeed displace macro and micro nutrients-rich food crops which would not be easily replaceable through the market, thus affecting negatively diet quality.

In the field of food policy, it was also noted that *food crops* have been often interchanged with *staple crops* or even *traditional food crops*. FAO defined *staple* as “eaten regularly and in such quantities that it constitutes the dominant part of the diet and a major proportion of energy and nutrients needs”³. Staple food is different in different regions therefore crop diversity can be highly context-specific (Ruel, 2003) because it adapts to natural and climatic conditions. It is argued that staple crop can improve the resilience to market volatility and reduce risks linked to the food supply imbalances, while providing more suitable nutrients than ‘exogenous’ food (ibid).

Berti (2005:1) listed three levels where biodiversity is linked to nutrition: at a macro level, at the farm output level and finally through dietary diversity (Jones et al., 2014). This confirms

³ <http://www.fao.org/docrep/u8480e/u8480e07.htm>

the multiple scales through which commercialisation mechanisms should be analyzed to comprehensively understand food consumption outcomes. Empirical studies have shown that higher crop diversity seems to have positive impacts on agricultural incomes, economic growth, and nutrition indicators (Von Braun, 1995; Barathi et al., 2014; Sunderland, 2011) because it tends to reduce economic vulnerability to price shocks and market cycles. Crop diversification is believed to hold also benefits for productivity, profitability and sustainability (ibid). Furthermore, it helps maintaining bio-diversity and reduces the exposure to climatic risks, reduce pests and disease, weed competition, and sustainable access to soil nutrients (Jones et al, 2014). A right balance of crops rotation can also increase the level of nitrogen available (Frison, 2011; Jones et al., 2014) and increase water-use efficiency (Bobojonov et al. 2013). Overall, multi-cropping is interpreted as a diversification strategy, aiming at reducing risks of food insecurity since it serves as a direct source of foods for the producers (Brokensha and Riley, 1978; Dorsey, 1999) and as coping strategy to contrast information asymmetry and market imperfections for smallholder farmers (Webb and Von Broun, 1994).

However, there are not many studies which look at the relationship between crop diversity and dietary diversity. Focusing on the farm-level type of diversification, empirical evidences in the literature in almost every case found positive correlation between crop diversity and dietary diversity (Kumar et al.2015; Dillon et.al,2015; Penafiel et al., 2011; Belanger and Johns, 2008; Jones et al. 2014; Malapit et al.2015). In Kenya and Tanzania, Herforth (2010) found out that the number of crops grown was positively associated with dietary diversity. Results are especially positive when those crops were also home-produced fruits and vegetables. Similar findings have been found in Malawi (Jones et al. 2014). In their cross-country analysis, Pellegrini and Tasciotti (2014:6), found out that producing more crops was associated with an increase in the number of food consumed by the household. Conversely, in some contexts, they found a significant negative relationship between production of cash crops, namely cotton and coffee, and food security (ibid). Those few results seem to show that, at the micro level, consumption reflects how many crops are produced by the household. Hence, these findings might suggest that policies oriented towards crop specialization might be less effective than crop diversification in achieving the objective of food security. However, commercialisation is very complex and processes are not linear, and even when we look at how they affect crop diversity, results are still not sufficiently significant to identify a universal answer.

As already discussed, the literature identifies commercialisation mainly with a) an intensification of cash-crop production, notably mono-culture and b) an upgrade from subsistence agriculture. However, these explanations do not reflect universally the various empirical evidences and are highly dependent on the scale of observation. In reality, there are very limited and unclear prescriptions about how agriculture intensification affects nutrition (Remans et al., 2015). Commercialisation can entail an intensification of small-scale farming, meant for instance as an 'increased average inputs of labour or capital on a smallholding, either cultivated land alone, or on cultivated and grazing land, for the purpose of increasing the value of output per hectare' (Tiffen et al. 1994:29) or as input expansion, or due to a change in technology or finally through a shift towards more valuable output (Creswell, 1997). Therefore, the intensification can translate in an increase of output with no effects on crop-diversity.

Hence, it is necessary to take into account that there are two main directions that 'commercialisation' could take. Indeed, in some developing countries an increase in market-oriented (commercial) agriculture determined an increase in concentration and specialization of cash-crops at the farm-level (Maxwell and Fernando, 1989). However, recently in other contexts there were observed patterns in which commercialisation has been pushed through a diversification of crops at national, regional, or household levels. These patterns of diversification have been often implemented in addition to 'subsistence' food crops to trigger, through HVCs (e.g. fruits, vegetables, but also livestock and aquaculture), intensive production. Such intensification could contribute to increase food self-sufficiency (Shively and Sununtnasuk, 2015). Various governments and international organizations recently intervened in this direction by incentivising the diversification via intensification of production towards new species or nutrition-sensitive agricultural practices, which have also higher returns in the market (Webb, 2014). Moreover, more recent studies have demonstrated that shifting cropping patterns towards more nutrient rich components positively affects nutritional patterns (Miller and Welsh, 2013). Under this perspective commercialisation does not necessarily affect food security, and innovation through the introduction of new crops would be indeed beneficial.

Nevertheless, at the early stage of the commercialisation process, households may decide to diversify their market-oriented crops and to minimize risks or transactions costs in the market by maintaining self-consumption. Indeed, Heltberg (2001) noted that commercialisation of

cash-crop, in context of high transaction costs and risks, does not always substitute food-crops because of the urgency for food self-sufficiency (in Leavy and Poulton, 2007:6). Also, lack of infrastructure might lead to high transportation costs, which in remote areas could drive the perpetuation of subsistence of production and consumption of food (Pellegrini and Tasciotti, 2014). Instead, others argue that the same infrastructural gap would increase processed food consumption (Mogues et al., 2015). Referring to such divergent evidence, Mazoyer and Roudart conclude that the majority of malnourished people are not living in urban areas but are small-holders farmers (2006). Hence, similarly to commercialisation, diversification sometimes is not the result of choices but rather constraints dictated by contextual factors and short-term needs.

Furthermore, by measuring the production diversity in terms of different food groups produced, some studies found insignificant effects on dietary diversity (Sibhatu et al, 2016). Indeed, crop diversity would be ineffective or decrease producers' dietary diversity if the food-crops grown do not provide different and/or additional nutrients (Sibhatu et al., 2016). Similarly, in case of non-food crop production, the nutritional contribution would be negative. However, cash-crops would potentially be beneficial because they generate income. In these contexts, market access has been identified as the major driver to improve nutrition. Other studies have raised scepticism about the benefits of crop diversity for dietary diversity. For instance, Dorsey (1999) investigates the relationship between commercialisation, diversification, intensification and concentration. His underlying approach considers the market as efficient allocator of resources. In this perspective, specializing according to market comparative advantages would be more rational than producing a different set of crops because it would increase cash-income (ibid). Moreover, farmers would respond and be able to benefit fully from market prices' incentives. Based on the above review, the relationship between commercialisation, diets and crop diversity gave nature to divergent results, both theoretically and empirically, so it is necessary to explain the structural and multidimensional dynamics that link production and consumption.

3.2.2 The thorny nexus between production and consumption

So far it has been underlined that commercialisation has taken place in multiple ways which produced inconsistent results. What crop diversity means in its context-specificity and what is its relation to food has not been definitely determined, and thus this case study offers an opportunity to disentangle further such issue. Here, it is believed that the outcome of agriculture commercialisation depend on the specific scale and policies that regulate and

balance such processes in view of the multiple objectives around production and consumption. It is argued, that commercialisation per se is not a driver of food insecurity and unilateral thesis are too simplistic because they do not account of the contextual structure and policy dynamics. However, *access, availability, and distribution* of food at the local and national level play a crucial role in avoiding frictions between commercial agriculture and food consumption (Sibhatu et al., 2016).

The multiple ways in which commercialisation has taken place have produced contradictory results in relation to crop diversity as well. The overviewed studies, although useful in identifying interesting observations and insights, explain only partially the empirical outcomes of commercialisation, which are indeed very context-specific, highly dependent on the scale of observation and the chosen temporal frame. As Remans et al. argued (2015) the relationship between production and consumption diversity has to be understood beyond household production, and should consider the multiple levels where specialization of production and commercial mechanisms meet. Therefore, it is argued that the 'intensification' versus 'diversity' of agriculture is a false dichotomy often based on rather weak analytical starting points and theoretical assumptions. Instead, the mechanisms behind processes of intensification-concentration of production have to be contextualised in two dimensions. First, in the social relations of *production* which depend on the processes of class differentiation and access to the means of production (i.e. Byres, 1991; Bhaduri, 1986; Bernstein et. al., 1996). Second, in the relations of *exchange*, that depend on specific configuration of regulation and redistribution that determine access to outputs, thus food consumption. Market regulations play an important role in preventing drastic shocks such as risks of supply scarcity where economic-institutional infrastructures are weak. The government or policy makers may intervene to shape market distribution and guarantee a stable and affordable food supply.

Therefore, to expand the empirical evidence and contribute to the theoretical debate, this research will explore the mechanisms of diversification and/or specialization operating in this case study and how they reflect on food outcomes. It will do that by acknowledging that multilayer political and social dynamics affect which and how crops get produced, commercialised, and then consumed. Moreover, the integration with the global markets adds a further dynamism to commercialisation. Those exogenous forces inevitably alter the scale and the nature of agri-food system meaning "the quantity, quality, type, costs and desirability

of available food for consumption” (Hawkes, 2006:2). On this matter, attention has recently grown on production-consumption linkages also within the classical agrarian change debate (Bernstein, 2016).

Based on this debate, chapter 8 will untangle the effects of commercialisation by expanding the empirical evidence on first, the impact of asset-based wealth on dietary diversity. Second, I will explore whether commercialisation leads to less crop-diversity. Thirdly, I will look at the relationship between crop diversity and dietary diversity. Finally I will look at how access to means of production and market channels impact on dietary diversity. I will argue that this case-study shows in all these cases a positive correlation. However, qualitative aspects and institutional complexities will help developing a more comprehensive understanding of the trade-offs and synergies around crop diversities, wealth and diets.

3.3 Market failure, public expenditure and food security

3.3.1 Market liberalization

“Governments are focused as never before on the importance of linking agriculture and food markets with improved health and nutrition [...] Moreover, production, marketing and consumption patterns are changing rapidly, which requires a new understanding of the dynamic pathways that link producers to consumers. The dialogue around healthy food systems [...] has to be reframed to take into account both intended and unintended consequences of policy actions and private sector investments” (Global Panel on Agriculture and Food System for Nutrition, 2014)

Until now I analysed the micro-level drivers of commercialisation. However, it is also necessary to discuss and capture broader macroeconomic patterns which contribute to explain processes of commercialisation and cash-crop production. Indeed, Bernstein emphasizes the dialectic between ‘micro capitalism’- linked to informality and petty commodity production -and ‘macro capitalism’, identifiable in the global agribusiness, and international trade (2013:15). Indeed, fiscal and monetary policies affect the degrees of specialization of an economy, the type of food available, and its distribution. This section analyses how such wider macroeconomic tools affect the production and consumption of food.

One perspective is identified in the predominant neoliberal growth strategies of the 1980s and 1990s. Such developmental policies were, as opposed to a more calibrated and gradual approaches to economic liberalization, based on anti-planning and anti-state approaches (Byres, 2003) and on the trinity prescriptions of stabilisation- privatisation –liberalisation (Oya,

2007:16). The underlying theoretical presumptions behind the 'Washington Consensus' policy package was that the market, even in situation of underdevelopment, should be the core driver of resource allocation (Chang, 2009). It would incentivise competition and therefore achieve the 'right' levels of income (wages) and price to guarantee purchasing powers and a vibrant market. As already mentioned, Delpeuch and Leblois (2014) underlined that food price regulation and subsidies create distortive effects for which farmers will take wrong decisions based on wrong price signals. The expectation of those reforms was that overproduction and underproduction will even-up through the removal of distortions, price competitiveness will raise and export opportunities will be created through trade liberalization and currency devaluation.

In many countries, those policies caused the erosion of rural incomes due to the increase of inputs' costs and the deterioration of terms of trade against the imports of manufacturing (Oya, 2007; Chang, 2009). After those policies have been highly criticised due the debts and economic social crisis they have produced (Kay, 2009; Akram-Lodhi and Kay, C., 2010a; 2010b; Oya, 2007), the dominant policy recommendations changed, yet very little, with the endorsement of the NIE perspective.

NIE theory admits that commercialisation benefits might not be equally distributed and therefore investments and public interventions are necessary to prevent and address market failures, such as harsh inequality and food insecurity (Leavy and Poulton, 2007). Poulton et al. emphasised how in SSA and in other 'depressed' or thin rural markets of the global South staple crops (e.g. cassava, rice, maize) are major productions in comparison to other types of crops (2006) so institutional interventions should target surplus producers to boost commercial agriculture (IFPRI, 2015; Poulton et al., 2006). In this perspective, the enhancement of productivity would release under-utilised land, labour and water which can be diverted towards cash/export crops (2009:66) and benefit the households by satisfying their food needs. Through such specialization, foreign currency would be acquired through international trade which will also 'secure' the necessary amount of food imports, and make incomes converge in a positive-sum game (Weis, 2007). In sum, rural markets should be deepened to enable a business-friendly environment which would support commercial-entrepreneurial farmers (Poulton et al., 2009; Akram-Lodhi, 2008). The necessary macroeconomic conditions to ensure that are very similar to the previous paradigm: political security, macroeconomic stability and favourable exchange rate, commitment to growth and support to private investment, clarity and protection of property rights and secure land

tenure, functioning major infrastructure, effective commercial banking sector, ongoing research and phytosanitary control system (ibid, 2009:42). However, the state can get involved to 'improve' the conditions of the market, or to fix it when it fails. Those interventions in agriculture are for instance financial and input schemes, extension services, and support to smaller farmers.

This body of theory has been adopted and implemented by international organizations and development agencies' through a set of policies called 'Post-Washington Consensus'. For instance, in the 2008 World Development Report on agriculture, developing countries were still advised to specialise on primary commodity production according to their natural comparative advantage to reduce poverty and boost growth. Through better access to credit and technology, poor small-holder farmers are seen as able to intensify (i.e. raise productivity) and commercialise (i.e. raise competitiveness) (WB, 2007). However, governments were 'allowed' to intervene to facilitate these objectives. Those recommendations have been formulated without acknowledging and addressing the political-economy barriers involved in the access to resources and the power relations within classes, the state and the market. Such understanding of the commercialisation processes has shaped the diversification and intensification of the production of different farmers through economies or diseconomies of scale, but also the availability and access to micro and macronutrients in the fields and in the markets.

In sum, it is important to look at the modalities of market integration and trade openness to uncover the causes around the lack of access to food. Trade liberalization can expose the food market to prices and supply fluctuations, with consequent productivity and competition losses (WB, 2007). Furthermore, as result of deregulation starting in 2000 (e.g. US Commodity Futures Modernization Act) food commodities production has been increasingly attached to financial markets. Empirical evidences have shown how during the 2007-8 food crisis, food commodities faced supply disruption and price volatility (Ghosh, 2010; Lang, 2010). Although the impact of financialization on food falls beyond the objective of the present research, it is important to acknowledge it to understand how different macroeconomic regulations affect massively the food systems, food producers and consumers (Isakson, 2014).

3.3.2 Different perspectives about state intervention

In the NIE perspective, although the state is allowed to intervene in case of market failures, its role as economic and political agent is rarely acknowledged. The state is external to the economy and its class relations and it is often depicted as intrinsically corrupted and rent-

seeker, but which nonetheless should be present as a 'non-intervener' (Fine and Saad-Filho, 2016). By contrast, I argue here that state and market relationships have to be understood as the product of underlying and specific economic social relations of production that condition and are conditioned by the political and social structure (Fine and Saad-Filho, 2014). Not last, in the framework discussed above the role and concentrated power of MNCs in the global value chains are overlooked (Weis, 2007).

However, different strands of thought have identified different causes and developed different solutions for food security in different point in time. Before neoliberalism became the dominant doctrine in the development agenda of many developing countries, in the 1950s and 1960s the state was believed to be central to support the rural production and reproduction. The state was encouraged to intervene to sustain the domestic demand and the domestic supply of food through active interventions in the domestic market (Akram-Lodhi and Kay, 2010b). Even earlier, Korea has been analysed as one case where the 'state agro-bureaucracy' was crucial in the management and strategy attached to agrarian commodities which enabled forward and backward linkages with industry through increase in food production and labour productivity (Storm, 2015; Saad-Filho, 2010; Burmeister, 1990; Wade, 2014). This is to show that the state can foster the destiny of agrarian transformation and how non-agrarian sectors need a productive and functional agricultural sector in order to develop (Storm, 2015). The Lewis model for instance has shown very well that stable and cheap food prices are potentially instrumental to keep wages low and boost employment in the urban sector to trigger growth (Byres, 1996; 2006).

Heterodox institutional economists see public interventions in and outside agriculture justified in view of long-term outcomes. Selective protectionism, farm gate price ceiling and price flooring, and more generally redistributive policies, can target infant and champion industries to support their development (Baker and Friel, 2014). Authors have shown that in the past, export bans, tariffs and subsidies serves both agricultural and broader national economic objectives (Oya, 2007; Chang, 2009). Those regulations can give priority to domestic food production and internal market development as opposed to prioritizing export markets (Dasgupta et al., 2007). Therefore, many tools are potentially in place to affect the evolution and outcomes of market transition for agrarian production. The role of the state in such patterns of transformation is proved to be crucial.

Heterodox agrarian political economy studies have raised more critical and substantial scepticisms on the observed effects of market liberalisation in agriculture and food consumption outcomes. The neoliberal agrarian restructuring has expanded export-led agriculture at the expenses of domestic market food supply (Akram-Lodhi and Kay, 2012; Das, 2001). Commercialisation processes have shifted the directionality and scope of production and capital accumulation with huge effects on land access, labor displacement, de-peasantisation and food commodification (Bernstein, 2016). As observed in chapter 2, capitalist-commoditized agriculture decouples peasants from the means of production and creates hybrid forms of workers which are very often neither peasant nor proletarian, namely neither net-producers nor only consumers. For instance, rapid rates of accumulation in Brazil have produced high rates of poverty and inequality, resulting in food insecurity (Akram-Lodhi and Kay, 2010a).

In addition, the liberalisation of high-value cash-crop for export have created disruptions with domestic food commodity production. For instance, after the Egyptian cotton was liberalized in the 1980s, Egypt became one of the world largest importer of wheat (Caliskan, 2010; FAOSTAT). Indeed, liberalisation policies deprived farmers from state subsidies, increased inputs's price, and exacerbated the risks and vulnerability linked to the volatility and instability of export commodity markets. As result of Structural Adjustment Programmes, the rapid destruction of petty commodity production increased dependence on food imports, by creating imbalances in the food market⁴. The increased dependency on import for primary food commodities, and the declined terms of trade of cash-crops reduced the possibility to finance economic transformation (Weis, 2009) and to create sources of employment for the new class of landless peasants. Thus, uncoordinated penetration of capital on strategic sectors such as agriculture as result of the abrupt withdrawn of state support, can create food system dysfunctionalities (ibid, Akram-Lodhi and Kay, 2008). Empirical evidence has shown that low levels of domestic food production has been often accompanied by increased food import, malnutrition and famine (Weis, 2007). In sum, many developing countries ended up importing more food than exporting agrarian commodities in a global market dominated mostly by western countries holding the financial and technological 'brain' of the commodity value chains. Moreover rich countries subsidized heavily their agriculture, thus reinforcing the dependency of poor countries on cheap imports (ibid). Table 3.1, showing the top six

⁴ Food balance: Quantity produced+ Quantity imported - Quantity exported - All non-food uses, stock change and waste = Food supply available for consumption

producers of cereals in the world, sheds light on the geopolitics of staple food production and provides insights on the hierarchy of power that characterises international sellers.

Table 3.1- Top 6 Producers of Corn, Wheat, Rice, and Total Grain, (in million tons)

Corn			Wheat			Rice			Total Grain		
rank	country	tons	rank	country	tons	rank	country	tons	rank	country	tons
1	United States	316	1	China	115	1	China	139	1	China	428
2	China	168	2	India	81	2	India	95	2	United States	398
3	Brazil	51	3	United States	60	3	Indonesia	38	3	India	217
4	Mexico	24	4	Russia	42	4	Bangladesh	32	4	Brazil	68
5	Argentina	22	5	France	38	5	Vietnam	25	5	France	63
6	India	21	6	Australia	25	6	Thailand	20	6	Russia	59

Source: USDA database (year 2010)

As shown above, staple food commodities markets are dominated by the United States, France, Australia and emerging economies such as Brazil, India and Russia. If we look instead at the share of export value, in 2005 the developed world held 65% of Maize, 75% of Wheat and 66% of Cotton (Weis, 2007). Furthermore, it is observable an increasing horizontal centralisation and vertical integration of hedge funds and trading houses which control the majority of the grain value chain and global trade (Clapp, 2015). Hence, the deregulation of financial capital markets and the consequent financialization of food, exacerbated by oligopolistic production, created instability of strategic grain crops (i.e. wheat and rice) price and supply in the world. Food markets became extremely unstable, which exposed many developing countries to harsh conditions of vulnerability, bringing back in the political debate arguments in favour of food self-sufficiency (Ghosh, 2010).

Nonetheless, it should be recognized that the impact on food consumption of 'market-enhancing' policies has been different in different contexts, and still not sufficiently assessed empirically. The liberalization of agricultural sector in the global South and the increased integration in international trade during the 1980s and 1990s, increased farmers' income vulnerability and exacerbates poverty (UNCTAD, 2001; Ponte, 1996; Akram-lodhi et al., 2007). Instead, Korea in the 1960s used a strategy of self-sufficiency for rice and relieved the balance of payments from the pressure of importing staple food (Burmeister, 1990:10). Such measures contribute to halt the erosion of rural income and made the income gap between urban and rural areas smaller. Indeed, after the WW2 evidence shows that many countries across Latin America and Asia started to adopt state-led agricultural development policies because it was believed that market alone would have not been able to provide the necessary

inputs for stable supply of food and guarantee an income to farmers (Kay, 2002; Chang, 2009; Reinert, 2012). In case of lack of welfare state and adequate fiscal capacity space, distortionary policy can avoid income volatility, which in the short-run can translate in education interruptions and malnutrition with catastrophic implications on growth in the long-run (ibid). Price stabilization measures based on price floor and price ceilings can therefore protect both producers and vulnerable consumers, or small farmer's net-buyers of food. In sum, because capitalistic development shows its unevenness especially in agriculture (Bernstein, 2010), interventions on inter-sectorial prices and poverty alleviations schemes are fundamental to avoid cases of extreme poverty among poorer subsistence farmers, especially in countries in which such delicate transformation is occurring.

3.3.3 Food Sovereignty, national self-sufficiency and the food system

In view of the economic (poverty) and social (nutrition and health) risks posed by the current trends of the world capitalism to many local agrarian structures, various propositions have been put forward in the literature. Within the heterodoxy, there are some strands which criticise the rationale and denounce the consequences of commercialisation. Political and academic supporters of food sovereignty have been increasingly discussed in the literature. Indeed, the conceptualization of food sovereignty offers a relevant explanation of the linkages between power and food (Schiavoni, 2017). Nonetheless, there is neither a unique understanding nor common definition of it. Indeed analysis varied depending on the scale and theoretical perspectives (Jarosz, 2010). One 'bottom-up' strand is concerned with the 'people of the land' underpinning politics of peasant 'resistance' to capitalism and food corporate regimes (McMichael, 2006, 2009a; Burnett and Murphy, 2014). Another 'top-down' strand focuses on the state interventions in food self-sufficiency (i.e. Clapp, 2014; Harrigan, 2014). Now I review these two responses.

Food sovereignty is broadly defined by the 'bottom-up' perspective as "the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems" (Nyéléni, 2007). The food sovereignty concept has been developed within *la Via Campesina* in the early 1990s but then expanded through different political and social movements of 'global agrarian resistance' which promote ideas of food justice, moral-eco economy and struggle in defense of peasantry's identity and local knowledge (McMichael, 2006; 2009a, 2009b; Edelman et al., 2014, Weis, 2014; Bernstein, 2016). Food sovereignty supporters

believe that preponderant corporate capital, monopolising the control of food provision as result of market liberalization and the erosion of the state, disenfranchises local producers and consumers from their power within the market. Those forces would lower the quality of the diet because more exposed to global transaction of processed and 'nutritionally-diluted' food (McMicheal, 2009a; Agarwal, 2014; Friedman, 2005, Bernstein, 2014). Export-oriented cash-crop productions, through the intensification of monoculture, would produce undesirable effects on nutrition and welfare among producers and consumers (Maxwell and Fernando, 1989). McMichael (2006) blames the neoliberal market (i.e. free trade agreements) for the food crisis, and he stresses the damages caused by the systematic commodification of labor and food in developing countries as a false solution to ensure food security. He argues that agricultural production has been increasingly industrialised through processes of standardization, simplification and intensification (ibid). Through fertilisers, herbicides, pesticides, greenhouses, genetic modifications and concentrated feeds, the pace of production has been altered with negative consequences in terms of nutritional values, toxicities, and ecological costs (Bernstein, 2010:90).

As alternative to and against the invasion of corporate 'food from nowhere', the solutions proposed are a) 'transform the food system to ensure that food producers have equitable access and control over land, water, seeds, and biodiversity'; b) people should have a say on how food is produced and distributed; and c) state must fulfill the right to food as the right to adequate, available, accessible, culturally appropriate, and nutritious food (foodsovereignty.org; Jarosz, 2014).

It is important to reflect on the differences between food security and food sovereignty. The concept of food security is characterised by an apolitical language, and it is decontextualised from the relevant political and economic power relations. Its narrative does not question the liberalisation of agricultural and food markets and it does not emphasise the structural inequalities underlining food production and consumption beyond the individual. Instead, the food sovereignty holds a strong political connotation which focuses on making explicit the political context in which food is produced and distributed, and in denouncing the damages of the neoliberal policies on the food system. However, the concept of food sovereignty also raised some perplexities. First, it is necessary to question the hierarchy of volatility's forces between the international and local markets. In particular, in rural contexts seasonality, low levels of technology and lack of storage often create supply disruptions and therefore price spikes (e.g. see the work on seasonality of Devereux and Longhurst, 2010). Furthermore, in

some ecosystems, self-reliance and autarky would be simply unfeasible. Also, such system of production might create little spillover effects on employment and productivity hampering dynamics of development, other than ensuring an effective diverse and healthy food consumption for all. Furthermore, in this framework, it is not spelled out which are the ontological structures that would separate the 'local' from the 'non-local' and who are the 'people' (Bernstein, 2014; Jansen, 2015). This is not an attempt to deny that profit interests can enter in contradiction with people's needs. However, it cannot be denied that at the local level, equally desirable profit-driven objectives can negatively affect the long or short-term needs of the most vulnerable classes such as landless peasants (Bernstein, 2014; Edelman et al., 2014). Also, many authors have challenged the assumption that all farmers would be willing to fight the cause of 'sovereignty' and rely on self-sufficient production (ibid). This view omits the dynamic dimensions of the socio-economic processes behind agrarian change and ignore the possibility that new alternatives would divert or affect their political and economic choices or preferences, including their inter-generational expectations (Agarwal, 2014). Therefore, little attention has been put on the internal dynamics of power which might overlook asymmetry based on gender, race and class among farmers (Agarwal, 2014), or deeper and broader question on how to restructure the world food economy (Edelman et al., 2014), or whether this setting would be able to feed the world (Bernstein, 2014).

The strand 'top-down' puts more emphasis on the role of the state and it argues that the state is a crucial strategic player in the market to ensure national food self-sufficiency. In a context of highly unstable global politics, rising population, urbanization and industrialization process, since the 1970s, an increasing domestic production of grain and staple food has been perceived as a driver of national security and stability (Jarosz, 2014). The national food self-sufficiency is here generally defined as "the extent to which a country can satisfy its food needs from its own domestic production" (FAO, 1999 in Clapp, 2017). The objective of food security here becomes a political objective and a national policy for which the state is held accountable. Self-sufficiency is usually assessed through a range of staple food commodities, mainly rice, wheat, maize or in terms of calories produced (Clapp, 2017).

Looking at empirical cases, China, Russia, India, Egypt and some Latin American countries have been increasingly focusing on national production of staple crops to enhance the access to calorie-dense food (Sibhatu and Qaim, 2016), and keep domestic price low and supply stable (Harrigan, 2014; Clapp, 2015b, Lombardozzi and Djanibekov, 2017). Governments have been using different tools to encourage domestic food supply and stabilize its prices. For

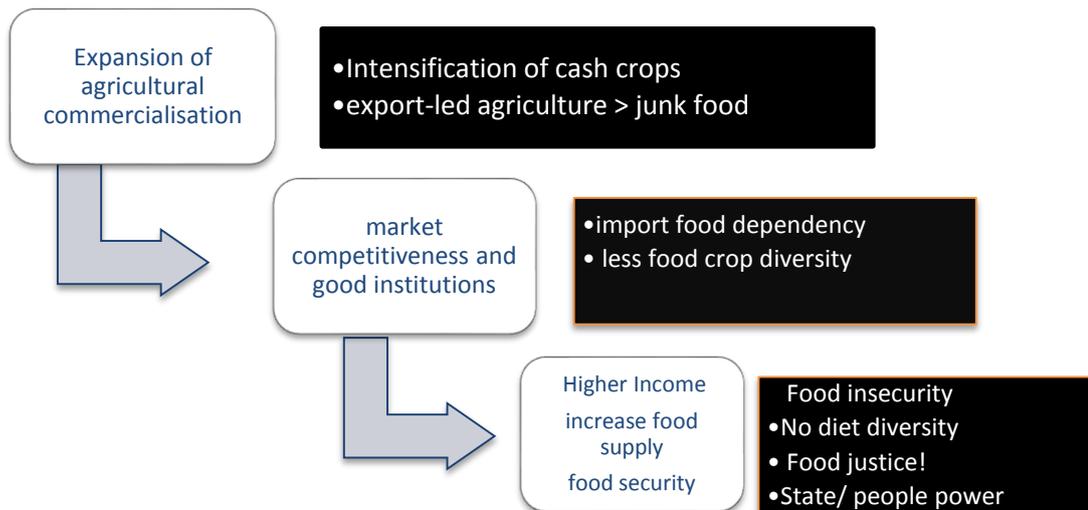
instance, the Tanzanian government banned maize export, rice import ban was implemented in Nigeria, and India implemented import duty on rice and wheat (Shama, 2011). In China, the term used to describe food security is *liangshi anquan*, namely grain security (Christensen, 2009). China has pursued food self-sufficiency through the production of grain whereas semi-perishable products (vegetables, fruits, and meat) are still cultivated in semi-urban communes and private plots. The Chinese government prioritizes food security policies for its distributional and nutritional implications as a vehicle to growth (ibid). National economic and social stability is indeed the *conditio sine qua non* for any sector's success (Delpeuch and Leblois, 2014). Food security, reached through national food self-sufficiency, is considered an instrumental step for the process of economic modernization. This policy suggests that during the process of development, prioritizing export-oriented crops rather than maximizing strategic food production for domestic consumption can cause detrimental effects on food access, especially on the poorest strata of the population. That is why policies aimed at increasing the domestic production of staple food can be considered to be 'pro-poor'. Indeed, an increase in cereal yields could have a great impact on poverty as it would lower food prices for consumers and lead to higher 'in-farm' productivity (Storm, 2015).

However, scepticism has been raised about this strategy from different theoretical perspectives. Indeed, what are the nutritional, labour diversification and price implications and effects of such policy are not addressed in depth. Mainstream economists have judged food-self-sufficiency as inefficient and market distorting because it gives wrong price signals to the market and prevents the full potential of more profitable sectors (WB, 2007; Sheema, 2011). The objective of self-sufficiency might clash with the efficiency of the resources used especially in terms of labor and land causing value stagnation. Barbier (1987) questions the environmental viability of such policy and questions the idea that export-oriented agriculture must be always more environmentally unsustainable than food self-sufficiency. Other authors looking at the agri-food systems noted an increasing shift from diversified cropping to ecologically simpler cereal-based productions, which have contributed to worsen diet quality and micronutrient deficiency (Remans et al. 2015; Frison et al. 2011).

From a more critical perspective, Clapp (2017) underlines that, even if a country is self-sufficient, it still needs to engage in commercial relations with other countries. Furthermore, although the country might reach national self-sufficiency in staple food, it does not mean that everyone will be automatically food secure because that will depend on the intersection of income, ecological and productive capability, physical and socio-economic access and

distribution of macro and micronutrient-dense food (Agarwal, 2014; Henson and Humphrey, 2015). Where diet diversification is driven by availability and access to micro nutritional components. Thus, food-self-sufficiency does not always lead to better nutrition neither. Figure 3.4 summarises the main differences between mainstream and food sovereignty perspectives.

Figure 3.4 – Mainstream-WB versus food sovereignty perspectives on food security

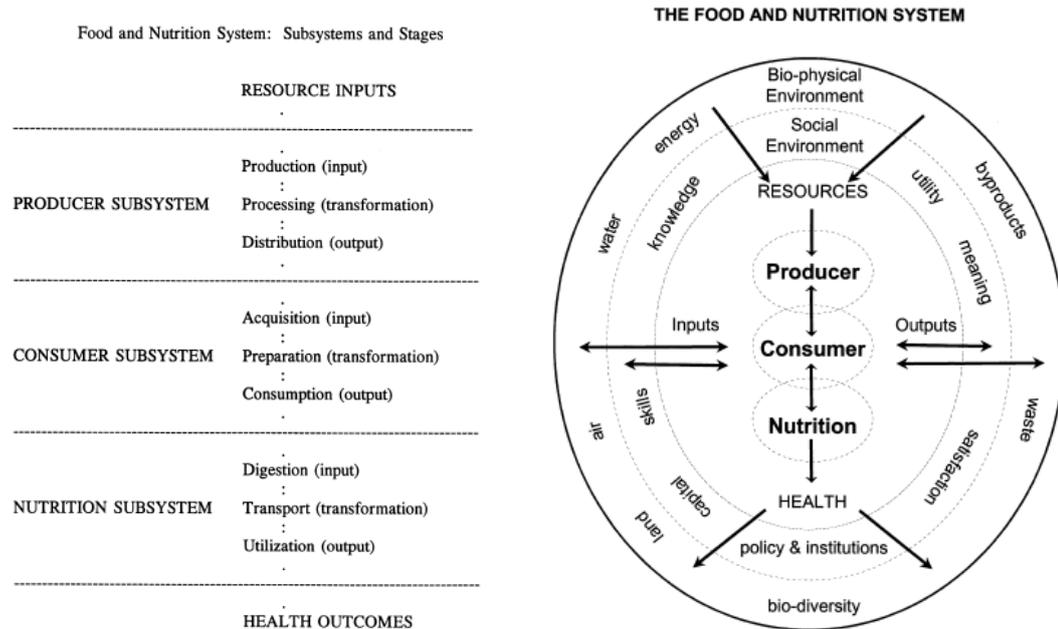


Source: author

Based on the above arguments, I now try to overcome such dichotomy and extend the analysis to different theoretical approaches which looked at how systems of food provision actually work. It is more and more emphasized in the literature that to achieve quality food consumption we need to look at how agriculture and *food system* interplay (Maestre et al., 2017). In this research, *food system* is defined as “the production, marketing, transformation, distribution and purchase of food, and the consumer practices, resources and institutions involved in these processes” (Global Panel on Agriculture and Food Systems for Nutrition, 2014). In other words, understanding how food is consumed means to understand how food is also produced and distributed (Oya, 2010a). The concept of food system describes a complex set of activities ‘from the land to the mouth’ involved in providing nutrient food, and underlines the links between food production and consumption in some specific bio-physical and socio-cultural contexts (Sobal et al. 1998). The integrated model presents a clear linear relation between agriculture, food, eating and health (1989:4). Screening the various debates that address the connection between food supply and demand, one way of avoiding food access vulnerability is by regulating food supply systems (Maestre et al., 2016). Regardless if

people access food through their means of production or through cash or in-kind payments, the way market forces for inputs or outputs are regulated affects massively their nutritional outcomes. In sum, the food system approach, as shown in figure 3.5, is useful to identify integrated solutions for food security in developing countries because it overcomes the limit of considering isolated and fragmented initiatives (Burchi et al. 2011).

Figure3.5- Food and Nutrition System



Source: Sobal et al. 1989

The food system approach recognizes that regional and international trade can play a role in shaping diet patterns. Hawkes defines the relationship between diets and market integration through (a) the agrarian production and exchange of goods in the forms of trade; (b) the flow of investment across borders through FDIs in processing and distribution of food; (c) the information sharing and promotion through marketing (Hawkes, 2006:3). The context-specific combinations of institutions, regulations and productive forces contribute to alter the food consumption patterns and food system through these dimensions.

It has been shown that the penetration of multinational corporations through FDIs in the national market strongly correlates with processed food and beverage consumption and increase in non-communicable disease, diabetes, and obesity (Hawkes, 2010; 2012). Authors also emphasised that markets integration incentivises the marketisation of cheap and standardized food, along with food sub-markets constructed on health-ethics-environmental axes (Hawkes, 2006; Goodman, 1997). The evidence described here confutes the converging

trends depicted in the nutrition transition approach discussed in section 3.1. In particular, the intensification of consumption of processed food commercialized in the international trade, coexists with sharp inequalities in food access between poor and rich at the global level. Those scenarios create the need for bringing back the role of the state in shaping agricultural policies and regulate the food market. So far, this analysis has shown that prioritizing profit maximization instead of food supply availability can be detrimental for food security at the household level as well as at the national level. Micro and macro variables and agencies shape food system, diet and empirical results are not univocal. Therefore, diversifying the domestic food system in low-income countries is crucial, because their financial and trade capability do not always allow to import from abroad all the necessary nutritional components.

However, also the food system approach has limitations. Indeed, it does not look in depth at which dynamics drive the political economy of consumption. It has been outlined that nutritional outcomes are driven not only by the available set of supply, and that food (consumption) choices are shaped by multidimensional factors such as gender, income, values, and knowledge (Sobal et al., 1989). However, rather than a linear flow, the food system interplays through complex upstream and downstream interdependent paths. Therefore, it is necessary to investigate how food systems alter the structure of competition, namely the market, and the tools of competition such as price, subsidies, rents and public goods rather than understanding how food embeds along those lines. In sum, food system cannot be interpreted as a mere dialectic of food use-values and exchange-values, exemplified in the ideal market through the meeting of supply and demand, or at the subsistence level, through production and consumption. Different drivers such as profit, wellbeing and social reproduction affect the way class, institutions, nature, and commodities interact within such open system at local national and global levels (Bernstein, 2016; Friedmann, 2004)

Fine notes that to understand the food system in a particular time and context, it is necessary to look not only at the industry of agricultural production but also at the consumption side of it (2004:6). The household for instance can be both a source of demand and a unit of production. Compelling forms of consumption and nature of production are therefore dynamic and get transformed by their reproduction over time but also by the cultural meaning that shapes the consumption and production process (ibid). The endogenous reproductive influences, those exercised externally and how they affect production, use and exchange of food will be analyzed complementarily to what Fine identified as the basis of

food political economy, namely a dialectic of *structure*, being ultimate condition of the productive system, which interplays with *forces, tendency, and contingency* -of market forces and multi/layers powers (2004:7). Thus, an exhaustive analysis needs to uncover the interaction between the structure and the various forces interacting with it, being the result of political, cultural, institutional, and historical trajectories.

The approach that embraces best such understanding of the reality is the *System of Provision* (SOP), understood as the integral unity of economic and social factors that go into the creation and use of a commodity (Bayliss, 2013:4). The SOP acknowledges different agencies involved in the system, outcomes emerge from the relation between agencies, are embedded in historical social structure and have different incentives (ibid). The SOP framework focuses on the chain of activities that vertically link production and consumption, but encompasses also the cultural and social –horizontal-understanding of consumption. It tackles the fragility of the theoretical concepts of marginal utility and consumer power as explanatory forces of the market exchange. Instead, it looks at the process that defines how culture interacts with consumer behaviours and how commodities are socially dependent on profit driven mechanisms. In sum, the SOP approach situates the analysis of consumption in relation to processes of production, distribution, and commercialisation.

It is undeniable that this case study offers an interesting example of how “consumption norms and demand are structured vertically through the chain of activities linking production and consumption, and where consumer choices are determined socially and historically” (Saad-filho, 2000:3). What Fine uses to explain highly distorted and profit-driven markets is here used to highlight the symbiosis between profit and non-profit driven systems of production and consumptions intrinsic in the overlapping of the modes of production identified in this case study (ibid). The SOP emphasises that the *organic* distinctiveness of food shapes its consumption and demand (Fine, 1994; 2002). Per ‘organic’ is meant “the physical properties of food and how they are created by, and related to the socio-economic condition within which they function such as perishability, short-cycle consumption and nutritional functions” (Fine, 2004:9). Hence, such characteristic of food suggests that there is an inverse relation between the nutritional function and the commercial function of food which is proven at multiple levels: on the one hand, markets attribute to nutritious fresh-food a short-term value because of its quick perishability, on the other hand the ‘nutritional component’ in processed food gets minimised, although is the nutritional component itself the added-value of food as human need as well as food-commodity (Dixon, 2009).

We have also mentioned that through commercialisation and intrinsic economy of scale, cash-crop could expand at detriment of a diversified food crop production creating vulnerability in food consumption. Therefore also at this level of analysis it can be observed that the biological reproduction enters in direct tension and contradictions with the tendencies of capitalist production. Food producers should specialise to increase outputs and productivity under the compulsion of profit.

Within this debate, the food regime framework has been pivotal to unveil the macro variables that influence small-scale dynamics in food markets. *Food regime* can be broadly defined as a 'rule-governed structure of production and consumption of food on a world scale' (Friedmann, 1993a, 30–1). It investigates and theorises how international capitalistic social relations of production determine the way in which food as commodity is produced, distributed, and consumed and the resulting forms of capitalistic forms of accumulation (Friedmann and McMichael, 1989). That is because food regime is part of a relational process enforced by rule and institutions. Food regime inserts the food consumption within an understanding of class relations (Dixon, 2009) confirming that class can be instrumental in analysing patterns of food consumption. The food regime theory relies on the study of historical and geo-political dynamics, and it considers the capital-state relations and producer-consumer relations (Dixon, 2009:3). It aims at identifying the '*What-When-How*' drivers that help distinguish regimes of food production and consumption through a) the international state system; b) the international division of labor and patterns of trade; c) the ideological legitimization of different food regimes; d) the relation between agriculture and industry; e) the modalities of capital accumulation and social forces; and d) the transition and interaction across and between different food regimes (Bernstein, 2015:6). In other words, the food regime approach offers a device through which understand the relations between capitalism and food consumers (McMichael, 2006; 2009).

The food regime framework identifies three main historical periodizations: in the first one (1870–1914) continental Europe and UK have hegemonic power and rely on cheap wheat from the colonies to finance their industrialization. It was state-focused with private capital taking a secondary role. The second food regime (1945–1973) was characterized by the highly regulated and subsidized agriculture in the global North and the US which dominate trade and agrarian commodity export, an initial industrialization of agriculture and emergence of multinational corporations. The third and current regime is "corporate-environmental". It is characterized by deregulation, liberalisation and financialisation embedded in neoliberal

globalization (McMichael, 2015). Peasants are seen as the victims of the accumulation by dispossession by big corporate capitals. Its food production is highly processed and highly traded, thus unhealthy and environmentally unfriendly. However, because of intrinsic rising inequality, it is also characterized by highly polarized productions, which span from ethical organic food to fast food. Dixon explains the dynamics of *nutritionalisation* of food consumption through the food regime framework and argues that, as result of changing socio-technical relations, the first food regime was characterised by 'imperial calories', the second by 'protective vitamin' and the contemporary food regime by 'empty calories' (2009; Winson, 2013).

The third food regime, although useful to identify structural trends in the world food economy, does not completely fit in the context of Uzbekistan for several reasons. As I will outline throughout the thesis, the Uzbek agriculture has not been fully liberalized yet, MNCs, processed food and empty calorie diets play a small role in the system of provision and lastly, the state highly regulates processes of accumulation and dispossessions of the means of production, in particular by maintaining land ownership. The complex relationship between the state, food production and consumption will be the object of analysis of this research. In conclusion, this thesis adopts a SOP approach because useful to analyse the context-specific and systemic outcome of both production and consumption. Nevertheless, the research also refers to the food regime framework and its analytical categories to assess how the state-capital relations inform the Uzbek food regime and bridge micro and macro dynamics. Thus, by overcoming the methodological individualism through which the dominant scholarship has analysed food security and commercialisation, chapter 9 will scale-up the analysis to assess the role that international markets forces and the state (Government) regulations play in shaping food availability, access, stability, and consumption. In other words, how different segments of society cope with the material ability to acquire food. Bearing in mind the multi-dimensionality of food, I will explore how such broader tendencies shape and dialectically interact with local processes of market transition.

3.4 Conclusions

In chapter 2 I have screened the literature on agricultural commercialisation looking at different theoretical perspectives and argued that it is necessary to use *modes of production* and *agrarian class stratification* as analytical tools to assess how agriculture market transition plays out in Uzbekistan. In chapter three I looked critically at how food security is studied in the literature and addressed in policies, and how commercialisation processes and

institutions affect its outcomes. I then extended the analysis to macroeconomic mechanisms and reviewed policies (i.e. food self-sufficiency and food sovereignty) and theoretical responses (i.e. food system, SOP, food regime) to food security. I identified the theoretical and empirical explanatory variables to analyze my object of investigation.

As Cook et al. (2004) explain, commodities hold a bundle of social, cultural, political, economic, biological, technological, geographical, historical relations that can unravel their multistring connections. Although “none of the physical, market or cultural/symbolic characteristics of any of these goods and services removes them from the domain of (capitalist) commodity production” (Bernstein and Campling, 2006:241). However the strategy, pace, source and direction of accumulation remain contingent to particular conditions depending on the contextual market, competition, technical change and trajectories and outcome of class struggle (ibid). Commodity chain and capitalistic value is exemplified through “tapping and transforming non-capitalistic social relations, human and non-human” (Tsing, 2013:1), and this transformation needs to be uncovered.

The problem with analyzing crops in exclusive boxes is linked to the uneven and combined development of capitalisms (Bernstein, 2006). This case study will confirm that capitalism continues to depend on primitive accumulation through commodity production and value creation, which is here identified and studied in the dialectic between non-capitalistic and capitalistic agriculture. “Capitalism requires heterogeneity which is the form of its success. By incorporating non-capitalistic relations, capitalism achieves its creative strength as a system” (Tsing, 2013:18). Tsing calls ‘rough edges’ the overlapping of productions for the market and for subsistence (ibid), whose link is understood through the norms and institutions that shape their transformation. Such boundaries are hard to define because of the linkages and overlapping with different modes of production (Gaye, 1998).

This literature review underlined that multiple scales of observation need to be included. As outlined in the introduction, the analysis will start by understanding how the micro social relations of production, because of strong state-led agricultural policies, are crop-specific and shape class differentiation of farmers as result of different access to means of production, patterns of accumulation, power relations and marketisation. Here power is meant following Bhaduri’s interpretation (2003, 1986), namely as the structural and behavioural elements that address the consequences of asymmetric access to financial, natural and human resources. This research will then grasp the connections between the crop productions,

access and social norms with respect to the local patterns of food consumption (chapter 7), and dynamics of wealth, marketisation and crop diversification (chapter 8). I will then use a combined and integrated 'food regime + SOP' approach to investigate which macro-drivers explain the outcome of food consumption and agro-economic transformation. In particular, I will look at the state-market relations which shape the Uzbek food regime, and I will explore the fiscal and regulatory frameworks that promote (or prevent) processes of agro-food commodification. These factors resulted in particular forms of accumulation and distribution which shaped the Uzbek pattern of development, but also the national availability and access to food.

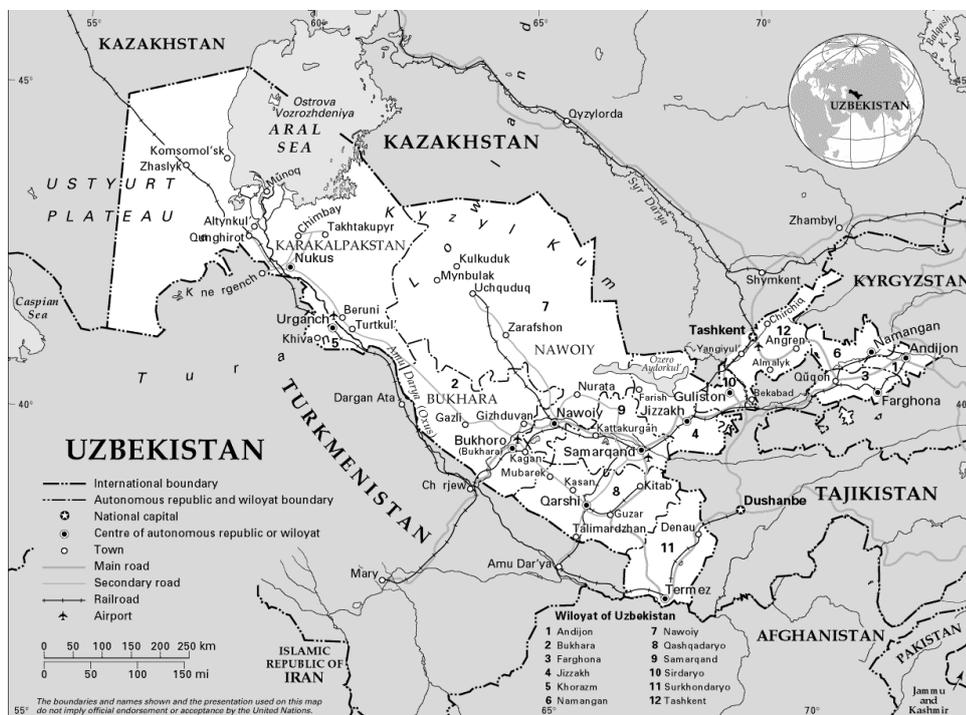
Chapter 4 contextualises this research by looking at the relevant debates within the literature of Post-Soviet economies and on Uzbekistan.

Chapter 4: The agrarian transformation of production and consumption in Uzbekistan

4.1 Uzbekistan at a glance

It is extremely important to understand the socio-economic characteristics and historical processes in which agriculture and market transition are embedded. Although the literature on post-Soviet agricultural transition is not extremely rich, however work has been done within economics, geography, sociology, anthropology, environmental policy, and history. In section 4.1 I overview the macro dynamics of the Uzbek economy. Section 4.2 focuses on the Uzbek agrarian reform since the collapse of the Soviet Union. Section 4.2.1 explores the evolution of institutions within agriculture. Section 4.2.2 discusses how different disciplines and theoretical frameworks interpreted those processes. Section 4.2.3 brings in studies of agrarian change in Post-Soviet countries. Specific attention is paid to the analytical categories used in those studies and those insights are going to support the scope of this research. Lastly, section 4.3 explores the studies assessing the most recent dynamics of nutrition and diets in Uzbekistan.

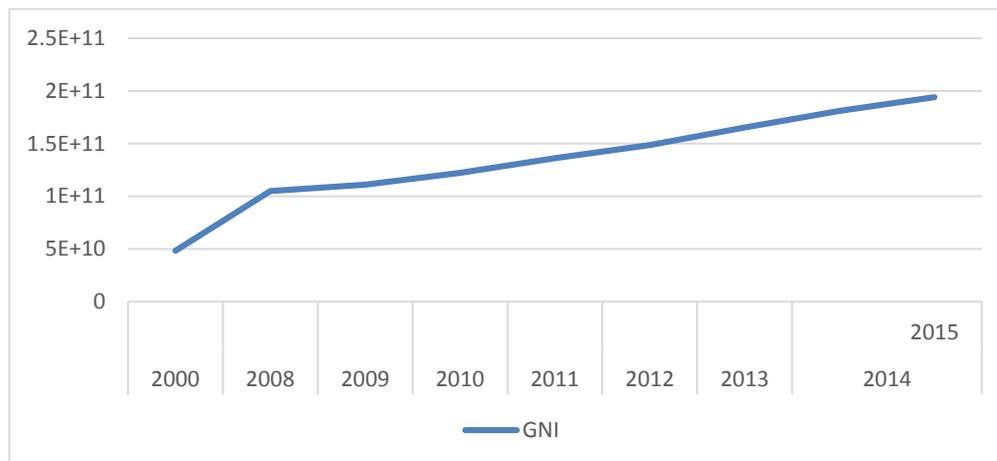
Map 4.1- Map of Uzbekistan



Source: <http://www.stantours.com>

Uzbekistan is a 27 years old republic which became independent on the 31st of August 1991, after the collapse of the Soviet Union. With over 31 million people, it is the most populated country in Central Asia. 43% of the people are between 25-54 years old (male 6,178,921/female 6,255,715) and the total active labour force is estimated at almost 12 million people (WB, 2015). 99% of the population is literate (male 99.6 and female 99.2) and women participate in good proportion to the working force, 43%, even in high-skill jobs, confirming the ‘progressive’ heritage of the socialist model implemented during the Soviet era (UNDP, Melvin, 2000). Uzbekistan is classified as a lower middle-income country but, contrary to other CIS countries which registered negative growth for many years after independence (Spoor, 2009), over the last 10 years the Uzbek GDP growth rate has been steady between 7% and 9% (WB, 2015). As per WB official statistics, 12.1% of the population are below the national poverty lines (headcount), which has halved by more than half in two decades (ADB). Positive economic trends are confirmed when looking at the GNI per capita (PPP), which increased from 1.950 USD to over 6.000 USD in 15 years, see figure 4.1.

Figure 4.1- GNI PPP (billion USD)



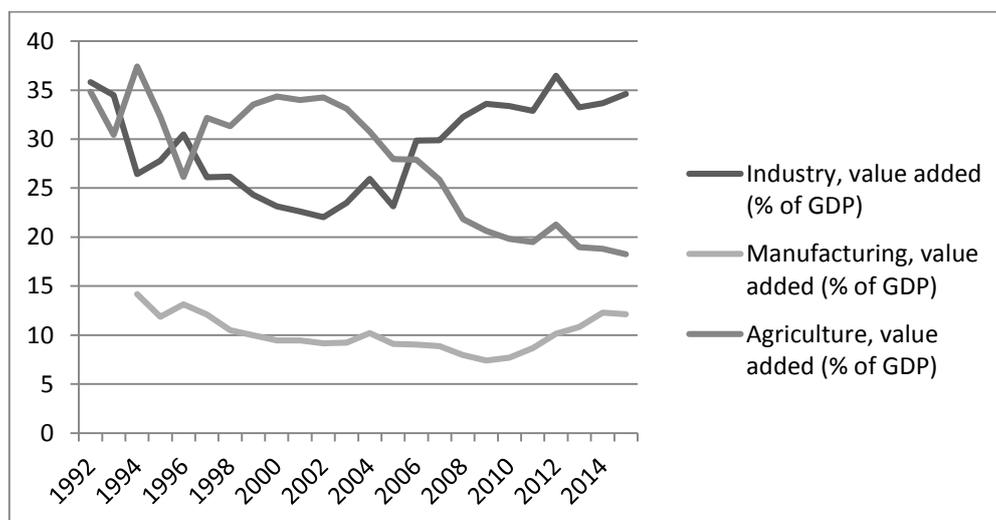
Source: WB (2015)

Although it is a double-landlocked country (which means that it is entirely surrounded by one or more landlocked countries, requiring the crossing of at least two national borders to reach a coastline), historically Uzbekistan has been the epicentre of one of the embryonic form of globalization. The ‘Silk Road’⁵ was a commercial route which linked Europe and China, where many cultures such as the Persian, Turk, Mongol, Indian, Russian and Chinese exchanged goods, food, and scientific knowledge (E.g. Chin, 2013; Melvin, 2000). This route has been

⁵ This term was used for the first time by the explorer von Richthofen in 1877

recently revived by the Chinese government under the ‘One Belt One Road initiative’ which tries to re-strengthen the commercial links between Central Asia and China and Eastern neighbouring countries through bilateral commercial agreements and large-scale infrastructure, investments and energy projects (Li, 2015). Nowadays, although it is not a member of the WTO, Uzbekistan engages in international trade. Its exports, valued at USD 1.38 billion in 2011, are mostly natural resources, such as gas and gold, and agro non-food commodities, i.e. cotton (47% of agricultural exports) and grapes (10%) (WB, 2015). However, it can be observed a sustained import of machineries which confirms the government of Uzbekistan (GoU) strategy of boosting the structural transformation of the economy towards more added-value manufactory goods (e.g. automotive, aerospace, pharmaceutical) and services (tourism, ICTs) through Import Substitution Industrialization (ISI) (Cornia, 2014; Lombardozzi, 2016). Indeed, the share of agricultural sector as percentage of GDP declined from 28% to 17% between 2000 and 2012, with industry and services taking over. However, the added-value of agriculture is increasing (See Figure 4.2). The state has undeniably an important role in market-transition reforms (Melvin, 2000) coordinating and transferring resources across sectors (Kay, 2002). Gradual state-led market transition was preferred to big-bang privatization (Pomfret and Anderson, 1997). In parallel, an extensive system of social protection has been developed to minimize the negative consequences of economic reforms (Melvin, 2000: 69). Such factors are fundamental to understand the implications for public investments in agriculture and how they affected process of growth and distribution at the micro and macro level.

Figure 4.2-Sectorial share of GDP (%) in value added



Source: WB

Indeed, 63% of the Uzbek population, around 17 million, still live in rural areas and cotton remains the core production of the national agricultural sector. Moreover, although agricultural labour force is increasingly employed in industry and service, around 30% of the population is still employed in agriculture, equally distributed between genders. If comparing this figure with other Central and South Asian countries, this proportion reached almost 60% in India but it is smaller in Kazakhstan (26%) thus placing Uzbekistan in the middle of the range. Most people rely mostly on subsistence farming and seasonal wage-labour in agriculture as source of livelihood (Staritz and Reis, 2013; Djanibekov et al., 2010). Those patterns suggest that it is necessary to absorb productively rural underemployed. As noticed in chapter 2, expanding agricultural market by boosting added-value productive and commercial activities, has been identified in many contexts as a driver of growth. Nonetheless, as already discussed, such processes have produced mixed outcomes on farmers' welfare and diets outcome. How the Uzbek agrarian transformation operates and how it affects the agro-food system will be explored in later chapters. Now I look at the historical evolution of the Uzbek agro-production system.

4.2 The origin of the Uzbek agrarian transformation

4.2.1 Agrarian reforms and farm types

The Soviet system was characterised by large-scale provisioning of machineries, intensive use of fertilizers, centralised-managed irrigation and extension services (Djanibekov, 2008). Heterogeneous processes of re-peasantization and de-peasantization occurred with the collapse of the Soviet Union across the new-born independent countries (Spor, 2012). Since independence, the GoU reformed the agricultural sector through progressive de-collectivisation which aimed at boosting efficiency in production and 'modernise' farms (Trevisani, 2008; Lerman 2001; 2008). In the first phase of the agrarian reform (1991-1998) the GoU transformed the state farms *Sovkhoz*es into collective farms *Kolkhoz*es. This reduced the government financial responsibility and transferred it to the cooperatives (Bobojonov et al., 2012). State procurement obligations remained only applied to cotton, rice and wheat. The second phase (1998-2003), through another 'light' reform, redefined the *Kolkhoz*es and state farms into *Shirkats*, a sort of cooperatives/joint-stock companies producing rice, horticulture, fodder, and animal husbandry. Private *Dekhans*, small household-based production unit with the primary goal of self-subsistence, were no object of restructuring (ibid). This reform did not lead to a real re-organization of big production units, which

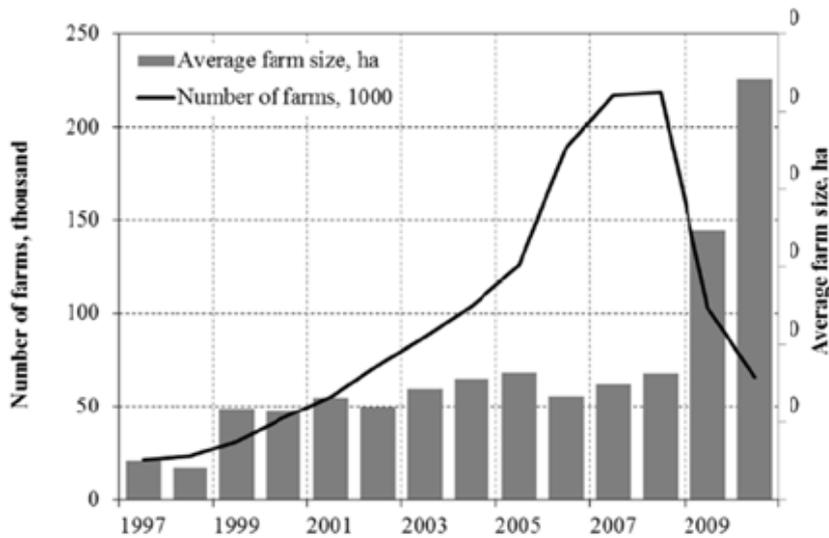
remained economically inefficient and loss-making (Djanibekov et al., 2012). However, arguably, this policy contributed to avoid the harsh inequality registered in other post-Soviet countries, which did not occur in Uzbekistan (Spoor, 2009a). It has been widely recognised that collective farming had a social function, channelling the provisioning of state services such as education, pension, and health (Spoor, 2012). However, with the legislation of 1998 there was an intensification of market-based mechanisms for food-crops.

The third phase (2003-2008) initiated the 'decollectivization' of the *Shirkats* through the segmentation and transfer of land lease agreements to individual private *Farmers*. Arguably, this period marked the *individualization* of the land titles (and production) as result of the top-down process of state-owned 'enclosures' (Akhrum-Lodhi et al. 2007). The objective was to increase land productivity and minimise the costs on infrastructure (Djanibekov et al., 2012) so to ensure a targeted and effective use of land (Elman, 2014; UNECE, 2015). Although most of the titles of the newly formed *farmers* ended in the hands of the managers of the old *Shirkats* (Trevisani, 2008), nonetheless, this restructuring destabilised the system of welfare provisioning from the collective setting to the newly invested 'privately-managed' *farmers* (Trevisani, 2009). Cotton remained a state-crop and winter wheat (also partially subject to state-procurement) production increased in volumes to satisfy domestic demand (at the expense of fodder crops).

In 2008 the GoU launched a farm consolidation program between cotton and wheat producers to optimize the farms' land size and to exploit economies of scale. Those who were leasing less than 25-30 Ha had to return the land to the GoU so the average land's size increased from 15 ha to not less than 30ha. This fourth reform has been judged as negative because first, it gave a signal of instability of property rights and second, it incentivised the polarization of small horticultural plots of 5Ha as opposed to large farms (Djanibekov et al. 2013). In addition, it created a mismatch between land and the irrigation system (Djanibekov, 2015). Based on the interview conducted during fieldwork, (August, 2015) The GoU implemented a further reform in 2015, to redistribute some land back⁶. Figure 4.3 shows how reforms affected over time the numbers and sizes of those farms.

⁶ Norm: О мерах по дальнейшему реформированию и развитию сельского хозяйства на период 2016-2020» от 29.12.2015 г. № ПП-2460

Figure 4.3 - Number and average size of *farmers* in 1997-2010



Source: The Uzbek State statistical committee (2012)

According to the classifications used in the literature, currently the *Shirkats* are very marginal, hence the Uzbek agricultural production is mostly configured around two types of farms (Trevisani 2003; Shtaltovna et al., 2014). First, the *Farmers* which have been traditionally cultivating cotton, then started producing also winter wheat (and in certain regions also maize and rice). Cotton harvest starts at the end of summer with a growing season that can be seven months long in rotation with wheat. The GoU annually fixes targets and local governments and it assigns quota of cotton and winter wheat to be produced by *farmers* based on expected yield and weather, and the area size which are then destined to public procurement. The GoU provides subsidised inputs for those crops (Rudenko, 2008). *Farmers'* land *de jure* is not a commodity and it is allocated for up-to 49 years to farmers through non-transferable long-term leaseholds contract (*ijara*) and it cannot be used as collateral. In 2003 the GoU switched the crop composition of some *farmers* by keeping winter wheat as state-crop but replacing cotton with commercial High Value Crops (HVC) which can be sold in the market. Such transition (or crop diversification) will be explored at the micro level in chapter 6 and at the macro level in chapter 9.

Secondly, the *Dekhans* are small-scale household farmers. *Dekhans* were expanded on average from 0.12 to 0.19 ha in 1993. Such small plots of land are considered the main source of food production and consumption for rural households (Lerman, 1996; Unicef, 2014). The national law currently allows households *dekhans* to use a maximum of 0.5 ha of non-irrigated land and 0.25 ha of irrigated land, with life-time access. This resulted in an increase

of land possessed in rural area even if not always adjacent to family house (Ilkhamov, 1998). Veldwisch described how *Dekhans* produce winter food-crops (i.e. vegetables potatoes, onions, and garlic) and summer crops (mung beans, carrots, green tomatoes, onions and mixture of maize, sorghum, and millet as animal feed). Those products are free from any state quota and prices are regulated by the market (Rudenko, 2008). However, they do not have access to irrigation, inputs subsidies nor mechanical equipment.

Table 4.1 shows the bimodal patterns mapped in Khorezm region based on a rural household survey conducted in 2010-2011 (Djanibekov, 2012). Similar setting has been observed in the region explored in this case study, Samarkand. This classification has helped to map farmers and support the exploratory stage of my fieldwork to develop the purposive sample of my survey.

Table 4.1- Categorization of farmers and dekhans

	Commercial farms	Rural households
Production specialization	Cotton-grain, livestock, horticulture, and others	Vegetables, fruits, wheat, livestock (consume largest share of own products)
State policies	Cotton and winter wheat subject to state procurement	No state procurement
Form of land tenure	Long-term lease contract from the state (30-50 years)	Lifetime inheritable possession from the state
Form of labor	Family workers and hired labor	Family workers
Employment	At own farm	At commercial farm and in non-agricultural activities

Source: based on DJANIBEKOV (2012b); VELDWISCH, BOCK (2011).

4.2.2 The studies on Uzbek agrarian change

Arguably, land reforms are crucial because, by altering the distribution and access to land, they affect economic efficiency and output maximization, productivity and employment, social and political control, welfare and equality (Bernstein, 2010). The current reconfiguration of production units, result of periodic and contradictory process of disaggregation and consolidation of land, has caused controversy in the literature on Uzbekistan.

Neoclassical authors argued that the current situation in Uzbekistan, namely the state-planning of agriculture and the public ownership of land is a barrier for the development of

markets, for the diversification towards high-value crops and for long-term investments (Lerman, 1998). Arguably, the land fragmentation occurred in the first two reforms has contributed to decrease the level and quality of farm services. Diseconomies of scale took place in relations to access to credit, supplies of equipment, extension services and self-knowledge (Djanibekov et. al, 2015). In 2008, it is argued, the process of consolidation through confiscation did not translate in stable property rights and market access but, it is argued, it discouraged investments, and market efficiency (Petrick and Djanibekov, 2016). Those conditions arguably perpetuated the low monetisation of the sector and cash flows into the rural economy. Nevertheless, it is admitted that cotton and wheat *farmers* have better access to technology, market information on new crop varieties, irrigation and inputs. Better access to information reflects in their greater wealth, status, networking options and interaction with trader and financial institution in comparison to Dekhans (Petrick and Djanibekov 2016). However, *farmers* are considered constrained in their production and profit potential. Because of such lack of growth prospects, *farmer' managers* are often absentee landlords which leave agriculture for more profitable non-agricultural opportunities (Djanibekov et al., 2013; 2012). On this note, Swinnen et al. (2009) argued that in the former Soviet republics pro-market reforms for competition were positively correlated with productivity enhancement.

Similarly, in the World Bank report on "Agriculture in Transition" which analysed the first decade of the former Soviet Union, land privatization is seen as the natural starting point in order to build an efficient business environment and create optimum land size based on management capabilities (Lerman et al. 2004:6). On the same note, the IMF Poverty Reduction Strategy Paper for Uzbekistan states that capitalist development is the structural goal underlying any agricultural and rural policy and it needs to replace the command economy (2008). It recommends that this market transition should pass through the abolishment of production targets, state production and consumer (including food) subsidies and the introduction of price liberalization to maintain budget balances. In addition, it has been argued that although those policies have contributed to generate positive growth, state ownership needs to be replaced with private capital and the GoU needs to privatise farms to enable market-based land transactions (ibid) because state investments are believed to have no effect on growth (Zettelmeyer, J. 1999). By contrast, Cox (2010) argues that such approaches have largely overlooked the heterogeneous realities and systems emerged from the collapse of the Soviet Union, the context specific relations among socio-economic components and the potential negative consequences of dispossession and exclusion from

small and large land holdings, which could result in unsuccessful reforms. For instance, the continuing practice of collective extended family work was believed to be functional to obtain diversified revenue channel and coordination in reproductive activities.

Finally, another recent policy paper published by Open Society mapped the Uzbek cotton value chain to show that GoU uses its power and corruption practices to control the national financial and material resource (Muradov and Ilkhamov, 2014). The paper describes the cotton sector as an “administrative command system of management where decisions are implemented under forms of coercion” (2014:3). The report states that the government uses ‘forced labour’ in order to maximize rent despite the decreasing yields and low efficiency due to the lack of investment. This has been judged as ‘bad’ per se, however it does not mention which are the alternative available sources or level of wage to compare to, or prove how a counter-scenario of free competition would have been less exploitative on labour. Through a detailed mapping of all the actors involved in the value chain (see Appendix I for a detailed list), the paper states that the GoU has established two layers of accounting: the profits derived from the cotton export, which are procured at a price lower than international market, are directed toward a funds called *Selkhozfond* under the ministry of finance that lack transparency and is accountable only to a small circle of the national leadership. Instead, the taxes on land use goes towards the state budget. Again, they propose to abolish the system of state-led quota and procurement and introduce ‘market prices and competition’.

However, more sophisticated analysis has been developed. For instance, a cluster analysis has been used to encompass different variables (Djanibekov et al., 2015). The authors identified three groups of farmers using such characteristics. Farm land, cash payments, and food commodity purchase expenditure accounted as major forces of the total variance within the population (Djanibekov et al., 2015). Although this exercise has highlighted that different types of contract arrangements exist, acknowledging that *farmers* play an important role as a source of livelihood for rural households and that there is differentiation among them, it does not uncover the power, scale and relational mechanisms behind these clusters (Burja, 2006).

Table 4.2- Carachterisitcs of rural households groups

Variable		Rural household group		
		1	2	3
1	Number of rural household members	6	7	9
2	Number of rural household members working on a commercial farm	3	2	5
3	Number of rural household members engaged in non-agricultural activities	2	3	2
4	Area of land rented, received as payment in kind, or used in sharecropping with commercial farm, ha	0.4	0.2	0.8
5	Livestock headcount	3.6	2.3	3.8
6	Share of food commodity purchase expenditure, %	34	36	33
7	Share of agricultural production expenditure, %	29	16	30
8	Share of other expenditures, %	37	48	37
9	Share of income from marketing livestock and crops from own plot, %	27	20	26
10	Share of income from crops and cash payments from farm employment, %	14	8	16
11	Share of income from land rented, received as payment in kind, or obtained as sharecropping from commercial farm, %	21	12	24
12	Share of income from non-agricultural activities, %	39	60	34

Source: Djanibekov et al. (2015)

In a more institutionally-oriented framework, Djanibekov et al. (2013) elucidate through network analysis different kinds of labour and productive relationships in *Khorezm*. They identify different forms of contracts that bond labour in the market: fixed-wage contracts, family labour, multi-seasonal, harvest-based, and paid in cash or in kind. Across the cycle of production, when crops require more labour, permanent workers are hired. Therefore, although not explicitly theorised, it is clear that different kinds of tasks which depend on the organic composition of the crop dictate different labour relations and determine labour demand. Also, it is noted that commercial farmers, prior to the sowing season, informally rent a part of their land for vegetables cultivation. Indeed, land transactions, through informal sub-letting contracts - paid at a fixed rate or through sharecropping - although are not foreseen by state rules, are *de facto* usual practice (Trevisani, 2008). The last type of arrangement is another sharecropping system called *Pudrats (ibid)*. *Fermers* provide fertilizers and machineries and irrigation, whereas households deal with the management and production. The harvest is divided accordingly but underreporting is considered a common practice (Djanibekov et al. 2013). It is noted that successful practices of one type of contract can have implications on other types of productions or non-productive relationships (ibid). It is explained for instance that revenue coming from wage-labour can increase the bargaining power of workers involved in the sharecropping. Furthermore, old power relations dynamics inherited from the Soviet Union period survived and coexist with pre-existing and new contemporary forms of power relations (Van Assche and Djanibekov, 2012). In this sense, it is acknowledged that producers, markets and state are interlinked in many ways.

However, again, the authors conclude that Uzbekistan suffers from, similarly to most of the others transition economies, a lag in market economy fundamentals and free market principles. This lag is observable through for instance the on-going regulations of staple food price and production quota, lack of a dense urban business environment or the highly regulated land access (Djanibekov et al. 2012; 2013). They argue that although privatization is not a magic bullet, unstable institutions, informalities, overlapping roles and uncertainty of property rights hamper the long-term investment capacity (ibid). Such unstable institutions created the need for informal negotiations among stakeholders. The central operation of the state and command economy is seen as a transaction cost because of the principal agent problem in monitoring costs on labour contracting (Pollak, 1985) as opposed to the effective monitoring control capacity of private small-scale farmers, sharing the same view of the neo-populists.

In conclusion, in the respective perspectives presented so far, state interventions and public investments are not considered for their positive effects on inequality, poverty, market price volatility and for improving food access. Such solutions simplistically bypass the problems linked to the lack of demand in the market and assume that market will be automatically created and adapt automatically to shocks after the system of procurement will be abolished and property rights established (for a critique of the market-oriented reforms in transition economies see chapter 2 and Lo, 1995; Chang and Nolan, 1995; Bramall, 1995). Several limitations can be observed for instance in the analysis of Open Society. The report does not show the sources of the indicators used and neither explains the 'social, political and ecological costs' it denounces. It links in a shallow logic forced labour, labour costs and productivity. However, whether the surplus value extracted by cotton producers is transferred to other productive activities or sectors it is disregarded. It does not report any interviews with the stakeholders, neither with high-level policy makers nor with farmers. Finally, the study does not contextualize Uzbek collective labour in its historical dimension, but it reduces everything to a corrupt system both at local and national level where the role of international players and traders in the cotton chain is not considered. Those reports have simplified reality and omitted crucial aspects of the national agri-system. Both policy makers and academic should instead rely on rigours data collection to develop a comprehensive political economy analysis of the sector.

In this research it is indeed important to acknowledge the weaknesses of the western ontological categories applied to understand the Uzbek's rural dynamics, which so far have

been treated either as pre, post-Soviet or never Soviet. For instance, it is reported as common practice for children of around 10 years old to work along with the adults in the fields (ICG, 2005) and be part of the 'productive' working force in a society based on reciprocity, extensive family work and school curricula which include manual work. Also, it is observed by some authors that social status is identified based on context-specific standards such as meat consumption, vodka and weddings, rather than on the level of education, or monetary earnings as in western societies (Veldwisch and Bock, 2011). For all those reasons, this case study offers an opportunity for unpacking analytical categories through an holistic approach, and therefore to redefine how to create and shape knowledge and epistemology inter-disciplinarily. In sum, most of the literature agrees on the fact that the abolishment of state procurement will diversify crops (Bobojonov et al. 2013). However, once state subsidies were withdrawn in other contexts, Spoor noted that farmers opted for risk-averse strategies switching their production toward wheat and potatoes to satisfy food security needs rather than opting for high-return cash-crops (2009:44). In these studies, *farmers* are treated as homogeneous and *dekhans* are not disaggregated from farm wage workers, obscuring the role of work relations and stratification in the pattern of market transition.

Lastly, the institutionalist analysis, although provide rich empirical materials, does offer a thin theoretical analysis of the evolutions of market fundamentals in the society, because the analysis still lack of a deep understanding of the social political and historical context in which those mechanisms are embedded. For instance, the Soviet and socialist heritage Uzbekistan holds through its history -*Tarix* -and tradition -*Rakhshat*- has hugely influenced the practice of mobilising young generations during the cotton harvest, which in fact dates back to the pre-Soviet era. Also, the post-harvest outputs are often accessed collectively in the form of wood for fire, or seeds for making oil. These practices eclipse the idea of individual property rights. In particular, these are examples of how mechanisms around labour and resource distribution are influenced by non-market factors and institutions. Because those factors are in constant evolution, they should be understood historically. Thus, the interaction between people, state and the market in this case study is acknowledged through the dialectic between market and non-market drivers and analysed in its context-specificity.

Pioneer ethnographic studies looked more widely at the historical path of the Uzbek agrarian change. They identified in the *kolkhoz*, the Soviet collective farms, the entry-point through which analyse assets and benefits in the rural economy beyond the formal rules (Kandiyoti, 1996; Trevisani, 2008). Those authors emphasised how the process of de-collectivization

dismantled the old forms of collective welfare and broke-up social ties between farmers and institutional references creating new power structures, inequalities, and new forms of poverty (Trevisani, 2003a; 2008). It is widely acknowledged among rural communities a nostalgia for the old kolkhoz (Kandiyoti, 2003b) which after the collectivization have suffered of 'knowledge loss' on various aspects of production and coordination, for example on seed selection of wheat, maize and potatoes, milk production and agro-sanitary measures (Wall end Evers, 2006). Also, it is underlined how land reforms have favoured local elites which resulted, in Khorezm, in unequal access to land where a large majority of peasants only have small plots almost insufficient to feed the household (Kandiyoti, 2004; Trevisani, 2007). By contrast, Roy affirms the persistence and reconstructions of forms of solidarity shaped by Soviet and pre-Soviet ties (1999).

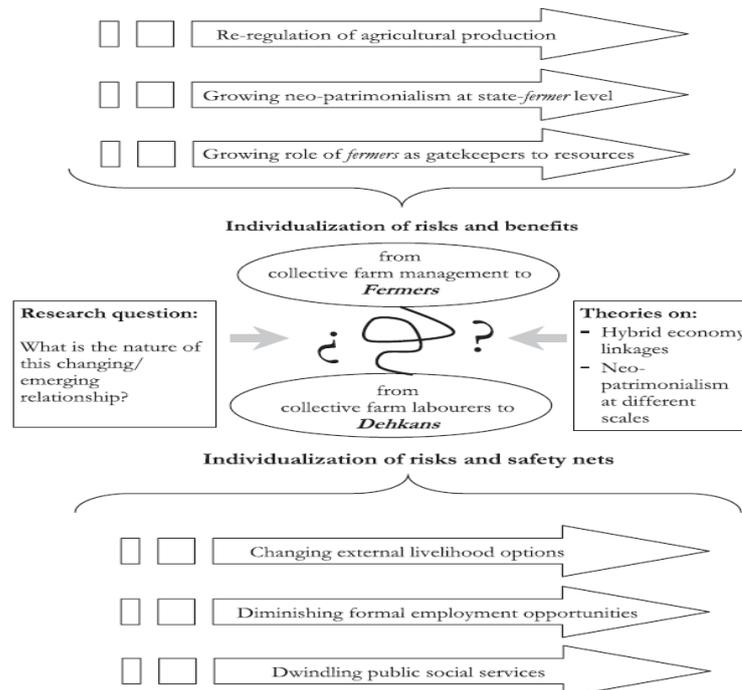
This body of literature believes that the kolkhoz was the centrepiece of the rural communities (*Shirkat*) which have resisted in their daily practices, work and livelihood through family and neighbourhood (*Mahalla*) (ibid). In this sense Kandiyoti (2003b) pointed out that such relationships can be seen as paternalistic, but they also function as a safety net for farmers. Peasants show a loyalty to a moral economy which favours collective responses to risk linked to market transaction (Scott, 1976). Nevertheless, it is also noted that although *farmers* could be classified as state enterprises and thus non-profit maximisers, they are inserted in a capitalistic market, because once fulfilling the targets for the state, they engage with market mechanisms through prices and competition in the bazar (Ilkhamov, 1998). *Farmers* managers are recognised for being in a privileged position however, increasing their entrepreneurial freedom is necessary to boost profitability (Trevisani, 2008). The capacity and possibilities of accumulation that *farmers* managers have will be explored in chapter 6.

As part of this cautious market reforms *dekhans'* plots provide a cushion against poverty (Kandiyoti, 2003b). As Trevisani (2007) put it, Dekhan is 'the primary unit of consumption, distribution and production' for the family. If not consumed at home, big clients of the *dekhan's* food-outputs are municipal organizations, hospitals, schools and kindergartens. Nonetheless *dekhans* also barter within neighbourhoods or sell to local bazars. Such petty commodity commercialisation, it has been observed, makes *dekhans* suffering from price volatility and market access (ibid). It is also NOTED that social conflicts arise between *dekhans* and *farmers* due to the struggle for the means of production.

The complementarity of old and new forms of transformation is defined as the product of 'civilization clashes' (Trevisani, 2016). In "*Rural communities in transformation*" Trevisani (2007) sees the *dekhans*, *farmers* and the state authority as the three agents involved in the process of agrarian change of Uzbekistan. In this view, the state is perceived as an 'authoritarian moderniser' not as successful as in Korea or in China due to the incomparable rural-urban divide and lack of growth (Trevisani, 2016). In sum, in these studies it is acknowledged that non-market mechanisms explain and feed into new social relations of production and social reproduction.

There are other ethnographic and mixed-method studies developed in the *Khorezm* region which studied the dynamics of such transitional rural economy and how rural production, employment, and production relations evolved after de-collectivization. They also acknowledge the existence of an inter-dependent bimodal system of production and distribution which comprises commercial farms (*farmers*) that produce mostly winter wheat (or other grains) and cotton and *dekhans* which provide labour to the *farmers* and produce food crop for its own subsistence (Veldwish and Bock, 2011; Eichholz et al. 2013). Here it is emphasised as well that these two types of farms are connected and interplay through different agencies and linkages where market, semi-market and subsistence merge and constitute one another (Veldwish and Bock, 2011:6 from Smith and Stenning, 2008). In this view it is argued that in post-socialist economies the collective farm is not the core of production anymore, but it is rather the household (or *dekhan*) which works for multiple sources of income and labor relations, paid or unpaid and organizational (ibid). Around the *farmers*, there is a system of services and resource transfer involving pensions, credit, special provision of gas and electricity, space to graze their cattle etc. This system affects farmers and their access to food crops, inputs (seed fertilizers and tractors, water), extension services and rural welfare (Veldwisch and Bock, 2011 Figure 4.4, Jackson, 2003).

Figure 4.4- A conceptualization of the dehkān–farmer relationship: neo-patrimonial relations and hybrid economies



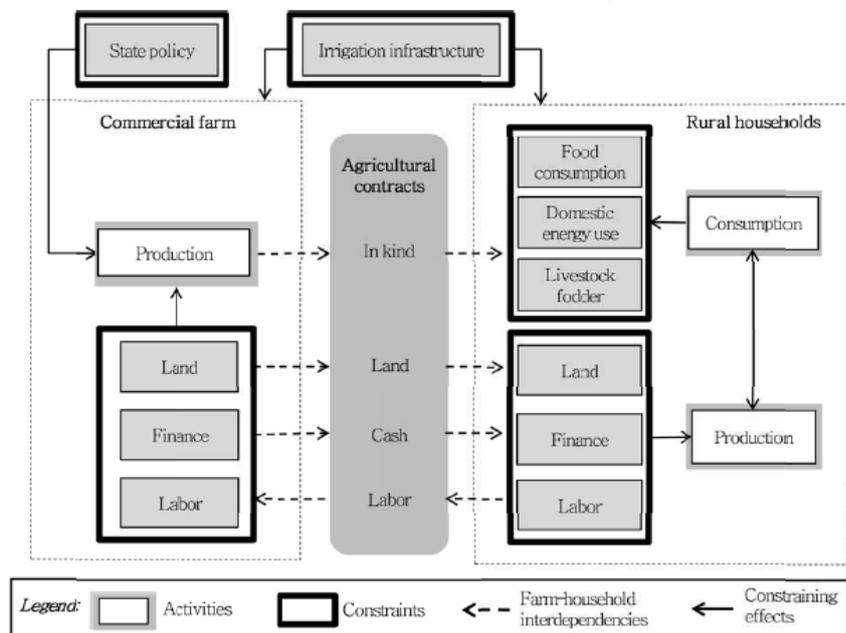
Source: Veldwisch and Bock (2011)

These works grasped important insights which show the socio-economic inter-dependencies around systems of production and exchange. They started an analysis of the ‘state’ and ‘private’ relations through local powers. However, the neo-patrimonial framework here adopted limits the scope of a broader politico-economic analysis. Indeed, neo-patrimonialism⁷ has been widely used in post-Soviet contexts to describe forms of ‘bureaucratic patriarchy’ and hybrid economic system based on networks which regulates favours and deals (Ilkhamov 2007; Lindner and Strulik, 2008). Although it unveils dyadic asymmetric power relations between an authority, or patron, and a group of clients however, it does not look at the trends of unevenness necessary to explain longer-term economic patterns. Authors (i.e. Wai, 2012) have pointed out how the neo-patrimonial framework situates the causes and effects at the same source under a circular logic (ibid). Therefore, this does not allow understanding the multidimensional forces that explain processes of accumulation, political classes’ behaviours, and broader political economic strategies. This research looks at how power asymmetry and interdependencies between *farmers* and *dekhans* shape both the incentive and the ability to accumulate and access food.

⁷ Weber (1968) defines it as personal authority and power ensured by tradition and personal loyalty

Veldwisch and Spoor (2008), analysing the 2005-6 reform in *Khorezm*, pointed at ‘mode of production’ as a useful lens to understand labour and production processes in highly regulated systems (forms of production summarised in Appendix II). In their qualitative analysis, they argue that cotton producers are the one making profit, but still not enough, because the surplus is extracted by the state (2008:17). It is argued that ‘all agrarian actors are mobilised in the exercise of the state production’ (2008:446). Indeed, the parallel relation between private interests and state interests is sometimes hard to distinguish (ibid). Among the literature reviewed they specifically explored whether Uzbek agriculture is commercial or not. It is argued that, because there is no private ownership of land, no ‘free’ output market, and inputs are highly regulated, there is not a capitalistic mode of production but rather a *commercial* form of production. This is because of the involvement of private capital and the presence of wage relationships outside the production of state-crops. In Khorezm, they argues, the commercial mode of production is operationalised along the production of rice, fruits, and vegetables (Spoor and Veldwisch, 2008). I will assess whether similar patterns are present in the case study of Samarkand.

Figure 4.5- Bimodal system of production and consumption in agrarian Uzbekistan



Source: Djanibekov U. et al. (2015)

Eichholz et al. (2013) analysed the competition over land and water after the 2008 consolidation reforms and political-economic capital conversion. This analysis feeds into Spoor and Veldwisch because it acknowledges the state not as an outsider of the economy but

rather as a field actor which, through the laws, the management of water, and land draws policies and creates inter-dependencies with the *farmers*. It is also recognised that the state is not a monolithic actor, but it expresses a multiplicity of overlapping and contradictory agencies and powers that interact with clan, networks, etc. (Veldwisch and Spoor, 2008; Eichholz et al., 2013). For instance, those who were at the forefront of the collective farms gained social and political connection with the Soviet elites. Those dynamics have been internalised in the post-Soviet structures, and converted for private gain within the revived structure of the *hokimiat*. Therefore, the market structures define the actors' behaviours whose strategies reinvent and redefine continuously the market itself (Eichholz et al., 2013). It is also argued that government actors and farmers rely and need each other, and each actors' strategy cannot alienate or completely bypass the other. Nevertheless, the interaction between old forms of *habitus* and the changing structure of the market is increasingly reduced because people cannot rely on old roles, skills etc. In this sense, it is fundamental to understand what are the new mechanisms formed that create divergences within farmers' contracts on land, labour and inputs and how this affect the diversification for food provision and economic development.

In sum, political, economic, cultural, and historical factors contributed to shape the modalities of availability, access and distribution or means of production in the Uzbek agrarian economy. Informal and formal production patterns overlap with commercial and domestic production forms. The studies described in this section grasp some of the political-economy stories arising from this non-straightforward shift to market capitalism. This literature looked at how market transition impacted rural economy and created exclusion and poverty. Different theoretical contributions highlighted interesting aspects. First, we have seen how different producers are not isolated but are interlinked to each other. Secondly, the state is not external to the market but it influences hybrid mechanisms of production and distribution at different levels. Thirdly, formal and informal dynamics are embedded in social relations of production and market transition.

What has not been explored in this literature is how the more recent re-organization of food and non-food commodities has affected the trajectory of the relations of production, distribution, and consumption. For instance, it is acknowledged that labour can be involved in *farmers* and *dekhans* simultaneously, but how such relationships impact class differentiation, surplus accumulation, and provision of food it is not assessed. Also, such patterns of agrarian transformation, characterised by export-oriented and protectionism in

agriculture, provide a lens to understand the linkages with non-agrarian sectors and the distributional and developmental mechanisms for the national economy. This research tries to understand the process of rural classes' formation and relative patterns of consumption and, along the way, understand how the state intervention (as 'centralised' accumulator) contributes to the process of economic transformation.

4.2.3 Agrarian transformation, class formation and policy interventions in Post-soviet contexts

After having scrutinised different scholarships on Uzbek agriculture, it is useful to expand onto the post-Soviet agrarian political economy literature since it investigated class differentiations. In section 2.3 I emphasised that, to understand processes of commercialisation, we need to look at rural transformation and how its socio-economic and historical specificity affect processes of production, consumption, and accumulation. This perspective allows understanding the origin of the social relation of production of this case study.

One of the authors who has provided a vast material on the development of agrarian capitalism in post-Soviet rural economy is Wegren (2011; 2004, et al.; 2006). His work emphasised how state policies changed agencies in the market, and influenced the dynamic of rural class stratification in post-Soviet Russia. Wegren (2006) challenges the stereotypical view that described the Soviet rural society as egalitarian and argues that such idea was more aspirational and ideologically-driven rather than real because stratifications were present. Classes in Russia have been differentiated mainly through income or hired labour (Nefedova and Treivish, 2003). Wegren added in his survey non-monetary variables to measure wealth based on shared attitudes and values, skills, and ownership. Non-monetary wealth was estimated to be almost 30% of the livelihood in post-Soviet Russia (2004). However, he recognised that money were used for investments, obtain capital stock, and acquire land or other capitalistic transaction that 'non-money' could not secure. Therefore, he admits that monthly monetary income played a role in the stratification process (2006:9). However, assets analysis serves well class differentiation analysis because it unveils past economic gains, present productivity capacity and future living standards. Wegren uses also an assets index to assess wealth, i.e. number of cows, pigs, cars, tractors, agricultural machineries, and agricultural equipment owned and used by a household (2006:13). In particular, land holding expansions, use of credit, income from crop commercialisation, and income from off-farm

wage labour were used by Wegren (2006) to explain the increasing stratification and market based reforms.

We know from chapter 2 that multidimensional indicators can grasp how individuals and classes access means of production, therefore unveils dynamics of class formation and how market transition plays out. Wegren offers an interesting methodological platform to study post-Soviet agrarian change, however his analysis does not lack weaknesses. For instance, Wegren adopts a Chayanovian approach to show that household which are less labour endowed will also have a smaller rented land and do not expand their property relatively to more people-endowed households. In this perspective, household composition and its size are the explanatory variable for production and income patterns. However, other determinants that contribute to differentiate the peasantry are overlooked. For instance, he states that assets are better analysed at the household level rather than at the individual level because of their 'collective ownership'. Nonetheless, such argument fails to grasp the asymmetric intra-household bargaining power and how resources and food are distributed.

Many authors have discussed policy outcomes of the post-Soviet transition. Wegren (2011) noted how institutional reforms from command economy to agrarian capitalism require macroeconomic liberalization, adaptation to a new economic environment at the household level and increase in entrepreneurship at individual level. He argues that in Russia there has been a strong adaptation of the rural population to entrepreneurship behaviours, especially among higher levels of income. However, grey areas dominated by corruption and informalities persist (ibid). By contrast, Heady (2007) argues that a certain degree of resistance to the markets still persists, which delays the creation of a transparent society based on the rule-of-law (Rose, 2000). Thus, the behavioural adaptation is still shaped by local forces. Rural enterprises were described for their low level of capitalization relative to manufactory, less prone to the use of machineries and technology, considerable flexibility in the use of wage labour (Cox 2010:346). In this sense, Wegren, argued that it is better to overcome the tension between resistance and adaptation looking instead at which are the degrees of adaptation, or rather how such adaptation operationalised through the above mentioned indicators. This perspective challenges the romanticised idea of peasants inclined to adopt 'socialised' responses to market risks based on their resistance to market transactions (Bernstein, 2010). In reality, peasants engage with the market and respond to market mechanisms.

A last consideration needs to be made about the fact that terminology and categories used in farming and food are hazy. Cox (2010) noted that, during the 1920s, peasants had more land at their disposal than the contemporary household plots, by confuting the belief that in Soviet times there was a restrictive land access. Therefore, the top-down governmental policies folded back the effects of redistribution of land occurring during the communist era and formed a powerful class of private commercial farmers. This policy infers very important implications in terms of output volumes, re-organization of production, division of labour, and evolution of capitalist agri-food economy (Cox, 2010). For instance, larger farmers specialise in cash-crops whereas household farming focuses on food-crops such as vegetables and potatoes. Such division of labour shows that nutritional outcomes are determined by production patterns, and invite to explore whether nutritional tensions could arise between food-crops and cash-crops.

This literature underlined that such modalities of market transition have created in some post-Soviet economies a stratum of super winners that grasped much of the entrepreneurial benefits. After the collapse of the Soviet Union, the sharp turn from planned economy to market economy which occurred through the adoption of *big-bang* privatization, has produced poverty and inequality, with sharp decline in agrarian production and income (Kalugina, 2014). In Russia, urban oligarchies differentiated their positions through skills, income, ownership and economic power (Wegren, 2006:2). In the case of Ukrainian countryside, Mamanova (2015) shows that privatization of agricultural land led to a concentration of Ukrainian black soil in the hands of the *nouveau riche* with spikes in land prices and inequality. Along this lines, Wegren observes that classes are so unequal that it's difficult to assert the rise of a 'middle class' rather than a mere dichotomy of rich and poor. In 'Measuring Social and Economic Change in Rural Russia', O'Brien et al. (2004), using household as unit of analysis, discovered new forms of inequality in the countryside which are primarily linked to the new forms of market entrepreneurship and commercialisation. They show that between 1991 and 2003 almost 40% of labour passed from large farms to self-employment which represent a huge shift in the socio and cultural life of rural Russia. In many post-Soviet countries such reforms created the necessity to have a primary and a secondary job to meet basic needs. Yet, it is acknowledged that the different forms of production, namely large farms and household sectors should be understood for their inter-dependency for labour and assets (Nefedova and Pallot, 2003).

In many post-Communist economies the rapid privatisation, individualisation of agricultural production, and reduction of subsidies have caused declines in farm profitability, agricultural volume, terms of trade and rural incomes (Swinnen et al. 2009; Spoor, 2009; Cox, 2010). Instead, countries which implemented less rapid market reforms have registered lower levels of rural poverty and smaller rural-urban divides, no episodes of bankruptcy, and lower levels of migration from marginal areas, especially in the agricultural sector (ibid). In Uzbekistan there is a fair development of infrastructure and facilities, decent levels of food security (see figure 4.6) and public social services (education and health) with decent figures in relation to low poverty, mass migration (due to the regulated system of internal migration) to urban areas and rapid liberalization (Kandyoti, 2003; Spoor, 2003; Popov, 2014; Kotz and Hall, 2004). Thus, transition to capitalism is a complex process which has indeed given origin to heterogeneous forms of agrarian change. Market reforms can be done at different paces accounting for pre-existing social relations of production, giving therefore origin to different outcomes and levels of inequality.

In conclusion, various thinkers tried to theorize and explain the different patterns that characterised the transition from state-planning to market capitalism, also by taking into account different forms of path-dependency. Several points can be learnt from this analysis. Transformation of production, given by the different use and access of the means of production, and the consequent commercialisation, is shaped and mediated by upward and downward forces initiated by local actors and institutions (Ye et al., 2009). Market-friendly reforms have been a necessary but not sufficient condition for the creation of a healthy market (Cox, 2010). For such reasons, the post-Soviet states have used different recipes based on the specific political contexts. Lastly, the state is a multifaceted actor which should be recognised as an internal agent in the market-making policies.

4.3 Food consumption and nutrition

As already argued in chapter 3, there is a fine balance between the objective of economic growth, food security and poverty reduction. The country programme framework on food and agriculture for 2014-2017 outlines the objectives of agricultural policy in Uzbekistan a) maximize and stabilize export revenues from agricultural outputs; b) achieve food-security and self-sufficiency in wheat production; c) support the development of the agriculture sector; and d) improve rural standards of living (FAO, 2013). Uzbekistan, on the one hand, needs large investments to stimulate growth outside and within the agricultural sector. To address

this objective the GoU is boosting investments in manufacturing, special economic zones (i.e. Navoi) and export-oriented agribusiness of high value crops. On the other hand, the government needs to address the immediate need of reducing poverty, underemployment and inequality under the objective of redistribution, especially in remote rural areas. These equally desirable objectives, signal the coexistence of potentially conflicting, and expensive, policy strategies. Indeed, both goals would contribute to the national political stability and social cohesion. In this context, food plays a fundamental role. Indeed wheat, thereof bread, is daily an essential staple food for people, and historically a source of political conflict in case of scarcity of supply (i.e. trade bans, embargos, Arab Spring). The role of the government in balancing those objectives will be discussed in chapters 9. For now, it is important to acknowledge the existence of such policies.

We know that since the Soviet era the state has always played a central role in policies linked to food and health. For instance, spreads of diseases have been controlled in the Soviet times through the implementation of water, health services and sanitation infrastructure (Cornia, 2014). Moreover, in the years right after independence food subsidies on bread, wheat, milk, and school meals absorbed half of total subsidies (Cornia, 2006:17), later substituted by cash transfers to poor families. In a context of reliance on import and supply shortage, these policies have avoided risks of food insecurity. As it can be observed in Figure 4.6, comparative analysis shows that Uzbekistan performs better than Bangladesh or India but is behind richer post-Soviet countries such as Kazakhstan and Azerbaijan, especially in undernourishment and per-capita food production variability.

Figure 4.6 - Selected food security indicators

	Average dietary energy supply adequacy, %	Food imports/Total merchandise exports, %	Per capita food production variability	Depth of the Food Deficit (kcal/capita/day)	Prevalence of undernourishment, %
Armenia	121	50	13	17	<5
Azerbaijan	129	17	9.8	11	<5
Georgia	117	50	27.3	221	24.7
Kazakhstan	144	3	23.1	3	<5
Kyrgyzstan	120	25	2.7	43	6.4
Tajikistan	100	34	5.8	262	31.7
Turkmenistan	127	3	20.6	19	<5
Uzbekistan	115	7	11.2	41	6.1
Bangladesh	107	21	2.5	122	16.8
Nepal	113	50	3.3	126	18.0
Yemen	99	31	1.4	215	32.4

Source: FAO (2013) Akramov & Shredhar (2012)

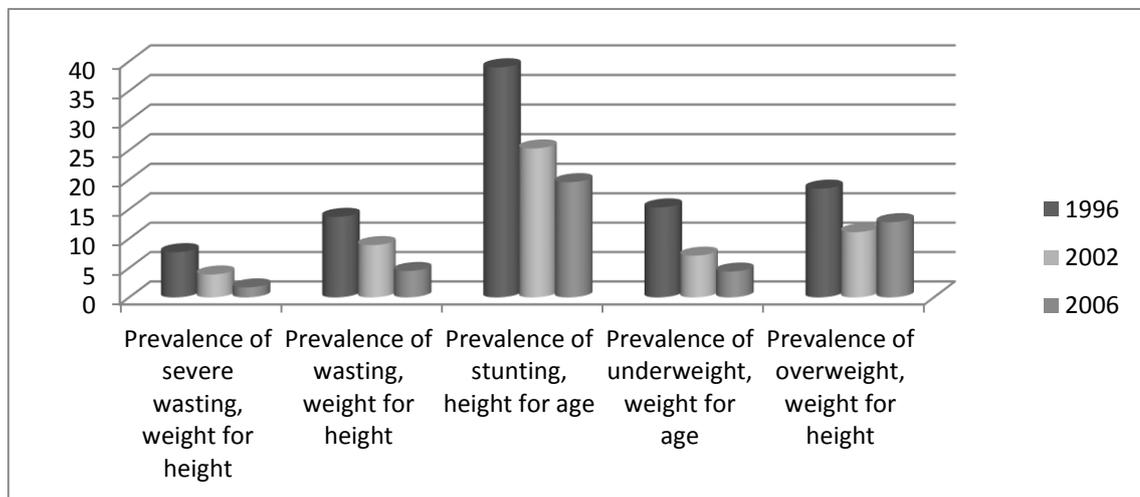
Looking at the micro-data on food consumption there are not many academic studies published on food security and nutrition, and data produced by international organizations on national nutritional trend are patchy, sometimes pointing at different directions, and not regularly updated (WHO data in Appendix III). According to a regional Panel Survey reported by FAO (2014) the total household expenditure spent on food is 53% on average in rural areas and 32% in urban areas. Ismail and Mickelwright (1997, in Hohmann and Garenne, 2010), measured child anthropometry in three regions in Uzbekistan (Tashkent, Karapalkhstan and Feghana: the capital, the poorest, and the richest agricultural area respectively) and found that results are positively correlated with dwelling characteristics and agricultural assets. Data collected from national demographic and health surveys have been compared between Uzbekistan and a selection of sub-Saharan African countries, and it has been found out that for children aged 12-71 months the average Z score weight was -1.04 for the poorest and +0.03 for the wealthiest (ibid). Wealthiest women were found to be taller. The most recent National Household survey in Uzbekistan which contains information about demographic health and nutritional status, have only been conducted in the country in 1996 and 2002 (published in 2004). It found out that stunting, calculated based on the BMI (body mass index) was widespread (children after 5 years old were below the -2 standard deviation thresholds) and were registered episodes of anemia and iodine deficiency (goitre). It was also found that poorest strata of the population usually eat less milk products, eggs, red meat, beans, nuts and seeds and fresh vegetables than the richest. The study shows that proteins were consumed once per week in the poorest households and 10% of the interviewed people declared that they spent at least a day without eating in the last six months.

In 2008, a study conducted by WHO tested the dietary diversity of children from 2 to 6 years old through 8 food groups (grain and tuber; dairy products, meat fish and poultry, F&V, vitamin A F&V, legumes and nuts, eggs, fats). The report noted that nutritional issues were not linked to the consumption of inappropriate food groups, but rather to the timing and quantity of the specific food given to children. Moreover the report noted that the marketing pressures from multinationals corporations were extremely widespread towards artificial milk products, which contributed to shift mother's choices on breastfeeding. A more recent research conducted in 2013 by UNICEF in various districts of Uzbekistan has gathered evidence on children and women health. UNICEF found adequate levels of dietary diversity among the majority of children less than 5 years old in the Namangan and Karakalpakstan region. However they found out that 30% of children do not reach dietary diversity in four food groups. The report explains that these results are not determined by the scarce

availability of food but are mainly due to the lack of knowledge of mothers who rarely feed their kids with pulses, eggs and dairy products. This caused stunting in the 12% of the cases. The report states also that the overall national food poverty is 36% of the rural population and 11% of the urban (Zoidze et al. 2015). So it can be inferred that hunger and poverty in Uzbekistan is mostly a ‘rural’ issue.

The national report on MDGs shows that the proportion of underweight children under five years old decreased from 3.8% in 2001 to 1.6% in 2013 (FAO, 2017). Uzbekistan achieved the MDG 1 target C in 2014 (FAO, 2015). In Samarkand, data show a reduction in underweight of 63%, from 2.9% to 1.1 % (ibid). Nevertheless such results are due not only to interventions in agriculture but also to synergized health policies. Indeed, the GoU started the promotion of breastfeeding, national immunization programs, increased availability and consumption of iodized salt (from 8% in 2012 to 64% in 2012), a national flour fortification programme to reduce iron, folic acid deficiencies and vitamin A supplement with 99.4% coverage of children aged 6 months (UNICEF; 2013 Wirth et al. 2012). Those nutrition-specific interventions, coordinated at the governmental level and implemented through ‘2010 Law on Prevention of Micronutrient Deficiency Related Disorders’, reduced anemia among children and pregnant women from around 62% to 37% (CER, 2015). Although indicators of wasting, stunting and underweight in children have improved over the last years, nevertheless, 13% of the population dies for nutritional related reasons, and around 15% of the population is classified as obese (WHO, 2014- Figure 4.7). This picture suggests divergent and contradictory consumption patterns where under-nutrition coexists with new phenomena of obesity and malnutrition (FAO, 2015) exacerbating inequality in quantity and quality of food consumed as underlined in section 3.1 when looking at the nutrition transition (Popkin, 2001).

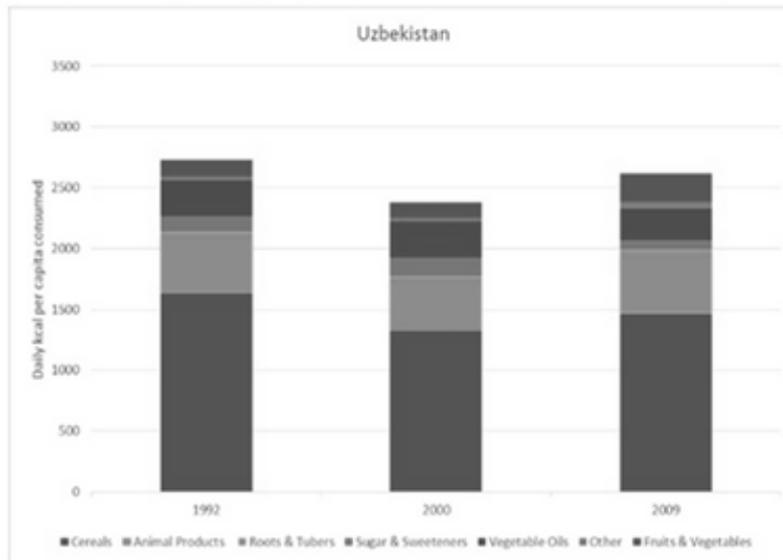
Figure 4.7- Nutritional indicators in Uzbekistan (selected years)



Source: WB/WHO

Figure 4.8 shows that, according to IFPRI (2014), fruits, vegetable and proteins consumption increased in the past years, confirming a slight but constant improvement of dietary diversity.

Figure 4.8- Dietary Diversity in Uzbekistan



Source: IFPRI (2014)

In conclusion, different findings of malnutrition have been reported and different reasons pointed out. The lack of food variety has been often identified as one of the main cause of malnutrition in rural Uzbekistan. It is underlined that those results are interpreted through the framework suggested by the WHO which define the components for a healthy diet and nutrient intake goals. I argue that it is important to acknowledge which criteria determines what a healthy diet is, as it was discussed in chapter 3 and further developed in chapter 7.

Starting from the considerations outlined in chapter 3 about the intrinsic complexities of the relationship between commercialisation of agriculture and nutritional outcomes, the nexus between agrarian-food system and food consumption are, in the context of Uzbekistan, still largely unexplored. Djanobekov et al. (2013) reported that in his study area rural households are not able to provide sufficient level of wheat for their own subsistence. By contrast, they acknowledge how rice, fruits and vegetables are produced in surplus for the market (ibid). Yet, we can observe a scenario where there is food security coexisting with an apparent monotonous diet and micronutrients deficiency (UNICEF, 2014). What is left unexplored is which have been the dynamics underlying the food and cash-crop production and how and if they contribute to explain the current food consumption patterns that led to such nutritional

situation. Those empirical results leave space to further enquire under which drivers and through which mechanisms subsistence agriculture and cash crops production operate toward these outcomes. In particular, how, why and what food farmers consume and access has not been sufficiently unpicked and contextualized within the current social economic and macro policy leaving space for this research to develop further.

4.4 Conclusions

In sum, most of the post-Soviet literature admits that the transition from communism was country-specific and non-linear (Wegren, 2006; Byres, 2008). It is acknowledged that the introduction of the institutions of the market increases the complexity and the stratification between capitalist farmers and wage labourers. This has affected the agri-food system and brought in new and increased forms of inequality and power relations. It is also acknowledged a clear scissor effect between losers and winners, with richest classes manifesting their economic and power achievements as opposed to lower classes, which instead manifested a sense of 'loss' and dependency as result of market reforms. However, such interpretations risk being circular (tautological) in their conclusions because they do not explain the dynamic implications of such patterns, such as for instance on accumulation.

This research is interested in assessing unexplored aspects of how market transition plays out in Uzbekistan. The originality of this research is based on the following points raised during the above review: firstly, it disaggregates farmers by crops produced, namely wheat, cotton, and fruits and vegetables to help explaining the current class differentiation. Because of the distinctive state-led regulations and system of support assigned to each crop, and because there is a clear understanding of 'who produces what', it is possible to ascertain how such institutional settings spur class differentiation. The main variables used to determine class differentiation are labour relations, access to means of production, engagement with market channels, and an asset index. These will be further explained in chapter 5 and investigated in chapter 6. Indeed, new social and economic relations evolved as result of the state policies and institutions which shaped patterns of local accumulation. The processes of transition on agrarian class relations shed light on the static picture of the society but also give us hints about how society is changing (Das, 2001).

It also disaggregates *dekhans* and wage labour, under a criterion that will be explained in chapter 5, to understand the implication of labour relations. The multidimensional aspect of

value produced through seasonal labour and formal and informal activities of food and cash-crop production is not sufficiently explored in the agrarian context of Uzbekistan. This study is fundamental to analyse the commodification of labour and means of production in different productive settings. This research will investigate the agrarian change in Uzbekistan through different dynamics. On the one hand it will look at the patterns of surplus creation and accumulation of the *farmers*, and how the government shapes patterns of intra (and inter)-sectorial surplus distribution. On the other hand, it investigates the intra-household dynamic of food crop production realised through family labour and how it impacts on food consumption.

The political economy of food has never been assessed in the Uzbek agrarian context. This research looks at agrarian production not only with respect to food supply, but also in relation to demand. It adopts a holistic approach which encompasses the 'production- exchange – consumption' system of food provision. It is believed that this case study through the analysis of food consumption patterns, dietary diversity and food security, is going to offer a lens through which to look not only at a particular food and agricultural market setting, but also at the role of the state as developmental actor, and as manager of inputs and output. Where possible, it pays also attention to the limitations of using the household as unit of analysis, and it tries to set the basis for further research on the gendered dimension of labour in the Uzbek transition.

In conclusion, in Uzbekistan, the agricultural transformation is embedded in peculiar cultural, historical, political and social institutions. The extensive and intensive cotton-grain bimodal production, together with the most recent expansion of the horticultural sector, feeds the need for this research to investigate the micro and macro intersections, starting by identifying the socio-economic differentiation and the relations to changing food consumption patterns.

4.5 The research questions

In relation to the debates so far reviewed, I will proceed by answering the following questions in the context of Uzbekistan.

- In chapter 6 I will investigate which are the different patterns of commodification among the different agrarian producers in the rural districts of Samarkand, in relation to a) The access to the means of production (inputs); b) Labor relations; c) The access

and profitability of different non-market and market channels (output); d) Creation of surplus value (asset accumulation patterns).

- In chapter 7 I will investigate how class stratification identified in chapter 6 reflects on food consumption, in particular dietary diversity and food security. Do market relations differences impact on food consumption patterns? Does gender play a role?
- In chapter 8 I will examine which drivers shape production, commercialisation and consumptions of these crops. I will test these dimensions through the hypothesis that: H1) An increase in income (wealth) leads to higher dietary diversity; H2) Marketisation leads to lower crop diversity; H3) Crop diversity leads to higher dietary diversity; H4) Commercial inputs –output impact negatively on diet diversity. I will also enquire which are the qualitative mechanisms that contribute to explain the results of these hypothesis.
- In chapter 9 I will investigate what, how and by whom agri-food is produced in Uzbekistan? What type of food is consumed, how and by whom? Which role has the state and how its model of development shapes the productive dynamics of production and consumption of food? Are these mechanisms ensuring a sustainable food system?

Chapter 5 outlines the methodology adopted.

Chapter 5: Research design, data collection and methodological considerations on fieldwork

After having reviewed the general literature in chapter 2 and 3, chapter 4 narrowed down the analysis to the theoretical and the empirical work on market transition, agrarian transformation and food consumption in the post-Soviet region with a specific lens on Uzbekistan. I underlined the drivers and implications of class differentiations in Post-soviet settings and the context-specific characteristics of the Uzbek transformations of production and consumption. Methodology and theory synergistically interact, as methodology shapes the way we look at reality and produce results, and reality helps develop more comprehensive methods to systematize better its complex components (Byres, 2008; Wegren, 2006). This chapter looks at the methodological rationale and techniques used to systematize the research process and how this has supported the development of the subsequent analytical chapters. I look at how the relevant variables discussed in the literature are going to be deployed empirically through this case-study. In the next session I will introduce the theoretical implications of the methodology adopted in this research. Section 5.2 looks at previous mixed methods adopted in agrarian research. Section 5.3 discusses the availability of data in Uzbekistan. Section 5.4 outlines the research questions and the corresponding methods. Section 5.5 discusses the quantitative and qualitative components. Section 5.6 discusses the methodological limitations and concludes.

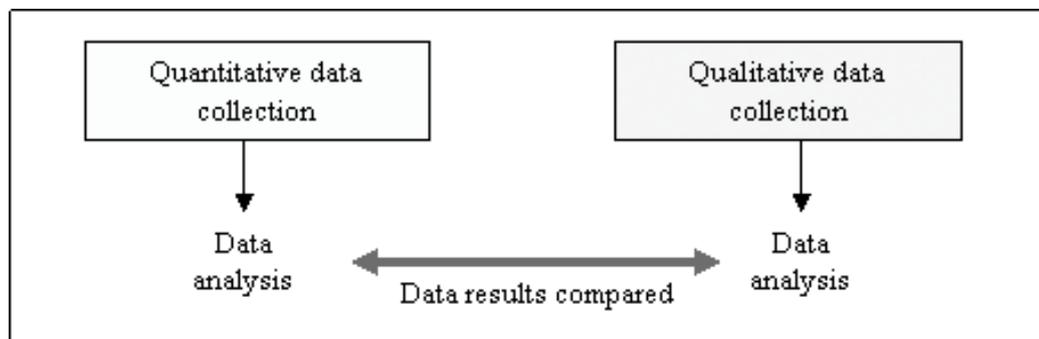
5.1 Why and how to adopt a mixed method?

Research methods in social sciences are conventionally divided into quantitative, qualitative and participatory approaches (Mayoux, 2006:116). Beneath different methods lie different ontological and epistemological assumptions and data collection techniques. Quantitative research collects 'numbers', seeks objectivity and causal explanation to deductively test prior hypothesis. Qualitative and participatory inductively values contextual meaningfulness recognising the contingent nature of social knowledge (Meyer et al. 2005; Mayoux, 2006). Mixed methods research overcomes the contraposition of the two, identifying a third way in which the two perspectives became complementary (Kuhn, 1969). The divergent methodological axiology does not entail a 'communication breakdown' (Morgan, 2007) but rather a complementarity (Greene, 2008). Discussing the recent evolution of the Economics scholarship over the last years, heterodox political economists adopted critical positions. Hodgson (2002), by stating that "Economics forgot history", explicitly raised the need to look more at the particularistic forms of institutions and culture to understand reality instead of

creating universal economic law of human behaviour. For the author, it is necessary to keep a wide, inductive, mixed and interdisciplinary investigation (ibid). The ‘retroduction’ manifested in the process of triangulation in mixed methods also allows the research to start from an analysis of the objects of observation and through inter-disciplinary categories seek to develop a theoretical understanding of such observation. Indeed, Webb (1966) states that if a hypothesis survives through multiple test methods, it will hold a stronger validity. For Denzin (1978), combining methods overcomes their unique deficiency. The triangulation of qualitative and quantitative methods (Bryman, 2004), defining multiple perspectives, can thus reduce orientation errors (Atkinson, 1995).

It is important to acknowledge the distinction between methodology and methods: methods, according to Morgan and Olsen (2005) are techniques of data collection and transformation. Methodologies are instead a combination of methods, the practice of implementing them and the interpretations made by the researcher (ibid). Methodology implies therefore the active role of the researcher in challenging and questioning the strengths and weaknesses of each approach and tailors the best fit for the research. The choice of methods is not only related to the particular ontology of the discipline but reflects the specificities of the research questions being asked (Risjord, 2001 in Danward and Mearmann, 2007).

Figure5.1- Mixed methods



Source: Creswell (2009)

5.1.2 The strength and weaknesses of dealing with a mixed method

Although the ‘learning’ process during the data analysis of this exercise has been sequential [QUALITATIVE > QUANTITATIVE+QUALITATIVE > QUALITATIVE], the data gathering processes that informed the data analysis was synchronized. Eventually, the implementation of the methods has been simultaneous. This type of temporal approach has occurred because of the practical convenience of being ‘already’ in the field and the time constraints given by the restriction of the visa period (see Hoddinott et al., 1992). However, during the data gathering

process, due to time constraints, the priority was given, although not always intentionally, to the quantitative material of the survey. This was due to two reasons: first, the survey provided with the biggest spectrum of systematic data relative to the qualitative one and required a disciplined, non-reducible, time investment. Secondly, the qualitative data were meant to support the understanding of the quantitative results during the subsequent phases so they could take shape in a more spontaneous and fluid way. However, there was no preliminary intention to prioritise the quantitative component over the qualitative one, but this occurred in an inductive way, as result of the possibilities and opportunities in the field. Nevertheless, the qualitative data supported, complemented the survey variables and results. In addition, those methods have been adopted on different groups, which were able to answer different research questions. Nevertheless, they have been connected during the process of data analysis. The qualitative and quantitative components have been interpreted and assessed whether they have convergences, variances or complementarities. In this way, the weaknesses of one method were compensated by the strength of the other. In this research the quantitative method- the farmer survey- provided coherent and systematic information on inputs access, commercialisation mechanisms, assets ownership, and employment relationship by including both qualitative (open) and quantitative (closed) response options. Instead, the qualitative component has provided 'background stories' that revealed nuances and filled the gaps that the survey questionnaire failed to cover (Kandiyoti, 1999). In addition, prior and supplementary qualitative desk research to contextualize social norms in relation to labour, gender, market mechanisms, power, history and politics played a critical role in framing the analysis.

The implementation of mixed-methods present challenges and opportunities. Often the answers of the actors interviewed are disconnected and contradictory. For instance, government officials and *farmers* have different opinions and interests about the quality and amount of support given to *farmers*. While the GoU judges them positively, farmers often complain about low prices and low support. Although it is challenging to integrate inconsistent types of data, capturing those divergent positions is crucial to unveil conflicts and enrich the research. The multiplicity of material allowed for a multi-layered process of abstraction and induction (Fine and Milonakis, 2009). In practice, in order to minimise the abstraction of the assumptions of the deductive component, the inductive part captured relevant aspects of the social system (Lawson, 2003).

5.2 Previous mixed-methods used in the studies on agrarian settings

Often, methodologies in social science research are developed based on the hypothesis and research questions posed in the literature, and the challenges that previous methodologies faced on similar research. For such reasons it is appropriate to make explicit the influence that previous methodologies adopted in similar research had on this one. Looking at the broad world of commodity studies, in some cases, pure quantitatively and econometric techniques have been applied, for instance when accounting for input-output flows, or when looking at labour productivity or profit and returns (for a critical review see Oya, 2002; Barrientos, 2004; Gibbon, 2001). By contrast, political economists studying global value chains, also use indicators related to qualitative analysis of costs, rents and profits of stakeholders involved (Ibid; Moyer Lee et al. 2013). Researchers in this case take into account the political-economic role that the particular commodity has with regard to government power, policies, and foreign capital linkages, to reflect on the upstream and downstream benefits (Prowse et. al. 2014). Institutional studies instead focus on transaction costs along the production chain governance (Poulton and Dorward, 2006, 2008). In some cases commodity chain studies have been criticized for focusing excessively on the linearity of production and distribution while neglecting horizontal multi-dimensions, including the different and contradictory roles and interests of rural workers and consumers, who are often involved in multiple income generating activities (Kaplinsky, 2001; Çalışkan, 2010).

I argue that, within a political economy analysis of agrarian change and commercialisation patterns, it is necessary to refer to the classical agrarian political economy questions of “*Who owns what? Who does what? Who gets what? What do they do with it?*” (Bernstein et al. 2006:22). These questions are relevant to untangle ownership regimes, forms of exploitation under a specific social division of labour and accumulations and consumption patterns under specific forms of production and distribution. Reviewing previous works on agrarian political economy, Harriss-White (1999) assesses power relations in rural Indian contexts through the investigation of: 1) economic assets; 2) distribution control and costs of information; 3) behavioural indicators; 4) credit and finance; and 5) non-economic indicators of political and coercive power (Bargawi, 2014:5). This approach, although it is valid to capture key aspects of a rural economy, in the present research risks to lose significant details related to non-monetary forms of the productive economy. In her doctoral fieldwork, Bargawi (2009) used a mixed-methods approach combining focus group discussions with village decision makers and producers, semi-structured interviews and in depth interviews with government bodies, marketing boards, cooperative unions, farmers and exporters. In her survey, farmers were

selected purposively based on land size, livestock, family labour, employment and use, family house structure identifying three classes of producers (poor, rich and medium). This classification has been only partially adopted in the current case-study because, as discussed in chapter 4 and in chapter 6, it would not reflect entirely the differences among farmers.

While reviewing studies on rural labour in Senegal, Oya assessed a number of econometric approaches based on game theory and household economics (2002; 2013). He observed that rural households in poor countries have so far been treated by this methodological strand as monolithic boxes working universally under the same rules and paradigms of utility functions, marginal theory of production, profit maximization and rational consumption behaviours. Such theories are based on restrictive assumptions such as a perfectly competitive labour market, the existence of an 'expansive' financial market and physical infrastructure, active market of inputs etc. (Ribier, 1992). Oya notes that, if we look closer at the dynamics of rural labour in agrarian contexts, it is clear that there is a significant diversification and seasonality of formal and informal activities that are linked to different sources of income which make the object of analysis extremely heterogeneous and complex to classify. He suggests taking into account that incomplete and 'dysfunctional' forms of markets coexist. He notes also how the household should be treated as a unit "with different dimensions: namely a consumer, a worker and a producer/firm" (2002:33). For all those considerations discussed in section 2.3, in his study on Senegal he creates an index to differentiate within farmers based on a series of criteria inductively derived from his fieldwork (2002; 2004).

The examples provided have important implications for this exercise. They show that many of the indices and variables used in different classification exercises can be successful in some research but can be inapplicable in others. Such challenges have to be addressed through a dialectic process involving on the one hand, categorising reality in an inductive and meaningful way and, on the other hand, measuring such context-specific realities according to standardised indicators. The necessity to do both relate to the desirability to report results that can be compared and contrasted to other findings hence the need for standardised indicators. However, this needs to be stated clear, so that context specificities are not disregarded within meaningful outcomes. This exemplifies the tension between deductive and inductive methods.

Nevertheless, studies that investigate patterns of labour stratification and farm classification in poor rural settings (e.g. Bargawi, 2014; Oya et al. 2004) prefer mixed methods in order to 'triangulate' quantitative survey data with life history, in depth interviews, and historical and

cultural secondary sources. A mixed methods approach is particularly relevant when trying to overcome the dangerously misleading categories of homogeneous 'farmer' or 'rural communities', which assume that all units of analysis bear the same bargaining power, instead of trying to grasp internal conflicts and conflicting interests. In this context, contrasting positions are expressed not only outside, but also within households, where females are protagonists of different dynamics in relation to labour market participation, food consumption, and domestic activities linked to social reproduction.

In view of the above considerations, I have designed a farmer survey tailored around the characteristics identified during the explorative phase of the fieldwork. This choice has avoided the risk of relying on out-dated household's survey whose sampling errors would produce inaccurate results. Also it has avoided analysing average and *per-capita* figures which would not provide any addition to the wealth of the literature already existing (Jerven, 2013).

In conclusion, my approach distances itself from a pure deductive approach and from the neoclassical assumptions of individual rationality, utility and equilibrium between supply and demands in the market. This case study triangulates the qualitative data gathered in interviews, the observations and focus groups with the quantitative survey data. It has two distinctive features: 1) a qualitative/quantitative/qualitative component and 2) an inductive purposive sampling. This has limited the quantification pressures and aims at capturing dynamics of the observed reality (Mayoux, 2006).

This research has started with an exploratory multidisciplinary procedure, and has alternated qualitative and quantitative methods by interplaying through historical materialism, constructivism and critical realism (Creswell and Clark 2007). The case-study attempts to produce an analysis that is informed by core variables identified within the agrarian economy, to explore the dynamics of market-transition of different crops and their implications for the food consumption outcomes (Bouis and Haddad 1990; von Braun and Kennedy, 1994). Based on the information gathered from the regional secondary sources overviewed in chapter 4, the present investigation starts with the acknowledgement of the existence of a bimodal system of agrarian production based on *Dekhans*, which provide subsistence food for the household, and *Fermers* which are bigger state- created production units specialised in state-led crops, namely wheat and cotton. *Fermers*, as outlined in chapter 4, have recently extended their production to 'commercial' crops, namely fruits and vegetables (HVCs).

The research breaks down the dimensions of production and consumption to assess how the individuals involved in those production units interact with regards to labour exploitation, access to means of production, engagement with markets and food consumption. Food consumption has been treated as an analytical lens which can untangle patterns of marketisation, inequality and accumulations.

In the quantitative part, I develop multi-variables indices and test their correlations. However, correlations test, although useful, are not sufficient to grasp the causalities and explanatory linkages. Therefore, the analysis overcomes the positivist interpretation of causality which can be established through multiple regressions but instead, using correlations test as initial instruments, it explains the causality of the empirical results through the use of qualitative material.

In conclusion, a gap has been noted in the literature on the complexities of the agri-food system in transition economies at different scales: micro, meso and macro level. In order to grasp the linkages between production and consumption, and how those mechanisms are reflected in the *use* and *exchange* value of food, the adoption of mixed methods seems the best option.

5.3 Data Availability in Uzbekistan

It was outlined in chapter 4 that the literature exploring agrarian change in Uzbekistan is not extremely rich. Also, there is a problem with patchy and not always continuous secondary data. The reviewed scholarship on Uzbek transition developed across different disciplines, methods, focuses and sets of categorizations. It can be mapped by disciplinary groups. Political scientists use qualitative approaches with a particular focus on government authoritarianism and corruption (e.g. Melvin, 2000; Spechler, 2008). Ethnographic studies within Anthropology, Sociology and Geography (e.g. Kandiyoti 2003, 2009; Trevisani, 2008a, 2009, Spoor, 2009) proceed through participant observations and other qualitative methods, and although provided many insights useful as analytical platform, do not use a systematic quantitative benchmark to refer to in order to assess the productive evolution of agrarian economy. In Agricultural Economics, most of the literature follows a neoclassical approach and develops econometric modelling on water management, crop diversification and governance, using micro-survey data (e.g. Djanibekov et al. 2010; 2012; 2013; 2014).

Further, quantitative approaches have been used in environmental studies which look at crop management and the implementation of organic cotton policies (see Bobojonov et al. 2009; Kienzler et al., 2011). Although useful in revealing association between relevant variables, those studies are often not able to unveil the causal mechanisms of an agrarian system typical of a political economy analysis. The most recent mixed-method research in Uzbekistan has been conducted by Veldwisch (2008a) who, looking at water access and agrarian change under a neo-patrimonial approach, has surveyed 648 households complemented with ethnographic observations. The research describes relevant aspects of the rural economy and provides interesting indicators such as the relationship between the *tomarqua* (family plots of *dekhans*) and *farmers*; the availability of workers per household (woman and men); the household composition, the share of household with members in paid employment; the share of household with members employed by a farmers. Although those categorizations are useful for the present research, they are insufficient to unveil the relational and power dynamics that underpin the social relations of production and consumption, which is the research objective of this case study.

In relation to secondary data on Uzbekistan, there is an issue of data availability. Those produced by the national statistical bureau are sometimes incomplete, often out-dated, of low quality given the low administrative capacity of the statistical offices, or not publicly available. The last National Household Survey, as mentioned in chapter 4, has been conducted in 2006. While surveys produced by WHO and UNICEF can serve as supportive basis, they are instrumental for specific policies and do not follow a systematic set of socio-economic indicators. Moreover, these often depend on the needs and conditions of donors funding (Jerven, 2013). Moreover unrecorded, informal and household activities play a huge role in the organizations of the economic sectors which are not reported in official figures (ibid). These conditions provide the necessity to collect primary data.

5.4 Research questions and corresponding methods

The Main Research Question: What is the relationship between crop commercialisation and food consumption in Uzbekistan?

HP to be tested: The example of Uzbek cotton shows no negative relations between cash-crop production and food security.

RESEARCH QUESTIONS	METHODOLOGY
<p>What are the patterns of production of food crops and cash crops in the rural districts of Samarkand and in the country?</p>	<p>Qualitative: general scoping, background stories, desk reviews, and institutional mapping.</p>
<p>Among agrarian producers, which are the differences in:</p> <ul style="list-style-type: none"> - access to means of production – <i>market channels</i> - <i>labour</i> relations - wealth accumulation through <i>assets</i> - <i>dietary diversity and food security</i> <p>Do these differences correspond to different engagements with the market?</p> <p>Do these differences inform <i>class</i> stratification?</p> <p>Do differences in the nature of the engagements with the market impact on dietary patterns and food provision?</p>	<p>Quantitative: purposive stratified farmer survey through face-to face interviews of 120 respondents in 10 district of Samarkand province: The survey is composed of four modules:</p> <ol style="list-style-type: none"> 1) Socio- economic characteristics 2) Commercialisation and market analysis 3) Asset index 4) Food consumption: Individual Dietary Diversity Index (IDDS)+ The Food and Nutrition Technical Assistance (FANTA)
<p>Which are the <i>triggering factors</i> of crop differentiations, commercialisation, food consumption and class formation? How does food provision work in rural areas?</p> <p>H1: An increase in income (wealth) leads to higher dietary diversity</p> <p>H2: Marketisation leads to lower crop diversity</p> <p>H3: Crop diversity leads to higher dietary diversity</p> <p>H4: Commercial inputs –output impact negatively on diet diversity</p>	<p>Qualitative + Quantitative = triangulation:</p> <p>Survey data + household participant observations and unstructured interviews with farmers, workers, households, women, local markets. Labour analysis to help to identify how labor is divided, technically and socially.</p>
<p>What, how and by whom is food produced in Uzbekistan? What type of food is consumed, how and by whom? What is the role of the state and how does its model of</p>	<p>Qualitative-inductive+ Quantitative-deductive:</p>

development shape the dynamics of production and consumption of food? Are these mechanisms ensuring a nutritionally balanced national food regime?	+30 semi-structured interviews with national and institutional experts; secondary data (FAOSTA, WB, TRADE map); Existing academic debate
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5.5 Organising fieldwork and data collection

Due to the scarcity of secondary data, the fieldwork aimed at collecting primary micro and meso data. It has to be underlined that the authorization of the fieldwork has been characterized by a long but eventually successful process. This has influenced the timing and material of the fieldwork activity of this research. Fieldwork usually requires authorization both from the affiliating institution of origin but also from the country of destination (Devereux and Hoddinott, 1992). In Uzbekistan it is not possible to conduct fieldwork with a tourist visa. At the same time, the system does not offer a 'research visa'. In this context, I applied for a business visa 9 months ahead of my established fieldwork start in August 2015. I also applied for the necessary authorization to carry out a survey in rural areas. It has to be mentioned that this research, although indirectly, touches upon sensitive topics for the country. The cotton sector has been recurrently associated to child labour and human rights violations by the mainstream media, policy and academia. This contributed to complicating the procedure to obtain the necessary authorization for my research. In addition, it has influenced my fieldwork, in particular when I approached local stakeholders in an institutional position to ask for opinions or interviews. In those cases, I perceived a sense of preconceived diffidence and lack of trust. Those reactions made me believe that my position was often associated and identified with a Western researcher or activist who wanted to discuss the issue of child labor. For those reasons, in every interview, especially at the institutional level, the exercise was firstly to eliminate this 'association bias', then explain my research. In light of these constraints, looking back at the choice I made of not interning for International Institutions during my fieldwork like many PhD researchers often do, although made the process of visa and research authorization longer, it allowed to underline my independent position as an academic researcher. Furthermore, my prior professional experiences with the UNODC in the country created mixed feelings to my institutional interviewees. On the one hand, this signaled my interests and genuine curiosity in the country, on the other hand, it created a degree of ambiguity regarding the reasons for my 'career switch'.

Eventually I was granted a visa and an affiliation with the Agrarian University of Samarkand. The process of data collection was carried out through two missions. In August 2015 I piloted

the survey, and started conducting exploratory observations and semi-structured interviews. In the second mission, from October to December 2015, I collected different sources of information, completed the farmers' survey and used various qualitative methods (see table 5.1). Although it would have been desirable to conduct two surveys in two different seasons to grasp different seasonalities, the qualitative component and the mission of August allowed contrasting seasonalities in production and consumption. August is indeed considered as a rich season, whereas the autumn-winter is less so.

Table 5.1 - Data Sources

Respondents / informants	Methods	Tools	Setting
National and International Stakeholders: FAO (2), ICARDA, WB (2), UNDP, WHO, GIZ, UNICEF, CER, Italian Embassy, the EU mission, policymakers and academics	+30 semi structured interviews	Semi-structured questions	London, Tashkent and Samarkand
High-school Students	1 focus group	Unstructured conversations	Samarkand university
Farmers	Individual farmer survey of 120 units	Questionnaire	Samarkand region
Urban middle class	Hosting family	Participant observation	Tashkent
n/a	Fieldwork notes	Informal conversations at bazars, taxi drivers, local administrators observations	Tashkent and Samarkand
n/a	Secondary data and Macroeconomic statistics		Desk research

Source: fieldwork log/diary

5.5.1 Quantitative component: the survey sample and selection of the research sites

The survey sample has been chosen with the main purpose of comparing and contrasting the multidimensional conditions of different types of farmers involved in different productions (Devereux and Hoddinott, 1992:28)⁸. In other words, the sample tries to capture the extent to which different groups of farmers had different access to a diversified diet. Furthermore, it sought to collect information on the differential of crops/ modalities of market integration, in particular with regards to labour relationships and asset ownership.

In order to fulfill such differentiation, it was necessary to develop ‘contrastive case-studies’ (Cramer et al. 2014), which required a purposive stratification of the population inductively derived by the specific characteristics reviewed in the literature and rearranged below. In this way the sampling achieved a greater representativeness than a random sampling (Fowler, 2013; Olsen, 2004). The identification of these groups has been possible because of the clear differentiation in the farm productions, planned by the central government and implemented through the local administration. As explained in chapter 4, the GoU decides where who, when, and how much farmers should produce in the allocated land for each state crop. Different regulations are attached to each production and commercialisation circuit of different crops objects of this analysis, namely, cotton, winter wheat and HVC. In particular, these settings have implications with regard to how these crop productions differ in inputs use, employment creation, market vulnerability and surplus creation/(capital) accumulation, and, of course, food consumption and access. This inductively-informed categorization of the population and disproves the homogeneity of production agents within the target population, which justifies a specific selection of the area, and supports a purposive selection of the geographic sample sites (Fowler, 2013). Therefore, after screening the relevant literature and with the support of key informants from the academic affiliation, the areas of research within the Samarkand province were identified.

⁸ See Devereux and Hoddinott, 1992 for an overview of the various challenges involved in selecting a survey sample

Table 5.2 - 'Private' farm (farmers) structure

Private farm structure, 2010.

Regions	All private farms		Cotton and wheat		Vegetables and melons		Fruit, incl. grapes		Livestock		Other	
	Number	Avg. size	Number	Avg. size	Number	Avg. size	Number	Avg. size	Number	Avg. size	Number	Avg. size
Rep. of Karakalpakstan	3,354	126.9	2,653	142.9	168	29	141	8.8	316	120.6	76	28.8
Andijan	6,175	36.3	2,551	75	364	8.6	1,554	10.1	436	20.7	1,270	4
Bukhara	3,953	184.6	2,679	122.5	67	10.3	642	8.2	508	778.4	57	2.8
Jizzakh	4,735	102.8	3,716	118.1	147	17.9	492	20	332	101.9	48	31.2
Kashkadarya	7,139	101.7	5,266	112.8	307	29.5	1,079	18.8	429	237.8	58	6.7
Navoiy	1,801	119.8	1,158	104.8	17	8.7	264	27.7	324	261.9	38	5.3
Namangan	4,515	50.9	2,377	83.3	119	12.3	1,445	12.2	240	41.6	334	9.1
Samarkand	7,723	64.4	3,013	122.3	1,519	29.5	1,968	15.9	425	58.2	798	35
Surkhandarya	4,951	122.4	2,490	110.4	0	0	1,576	17.5	701	422.3	184	41.7
Syrdarya	3,319	71.8	2,459	88	15	12	377	9.2	232	38.7	236	39.6
Tashkent	6,051	69.8	2,833	103.6	650	25.4	1,809	19	539	118.7	220	63.2
Fergana	7,737	37	2,709	85.6	259	7.7	4,280	9.1	318	37.1	171	8.2
Khorezm	4,681	44.1	1,992	90.4	15	6.1	1,337	6.3	529	25.5	808	5
Uzbekistan	66,134	80.1	35,896	106.3	3,647	23.5	16,964	13.1	5,329	205	4,298	18.3

Note: Average farm size given in hectares.

Source: Ministry of Agriculture and Water Resources, Republic of Uzbekistan

Source: UZstat

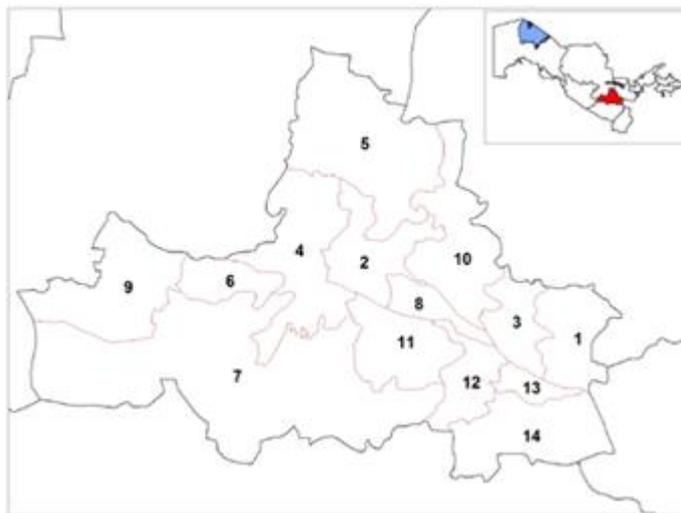
Samarkand is the third most populous region of the country, has a central climatic zone and vegetative period of 190-200 days and the evaporation is usually higher than rainfall (240-270 mm per year) (FAO, 2002). It is considered to be one of the most fertile and potentially productive areas of the country for agriculture with an area of 2.467.000 ha. It is one of the main regions devoted to wheat and the procurement volume amounts to more than 600 million tons. It is also a big producer of cotton and HVC. Because of its natural comparative advantage in agriculture this region makes a very relevant case study for the scope of this research which investigates production and consumption patterns. The government is increasingly trying to maximize the availability of arable land among non-irrigated areas, which requires huge amount of investments. Thereof, multiple reasons informed my choice: first, it is one of the regions which has been at the forefront of restructuring of production towards new HVCs thus provide a good example of dynamic transformation. Its economy is linked in a relevant way to agriculture and thirdly, it is a good representation of the average socio-economic situation of the country, being neither the poorest nor the richest region.

I identified cotton-growing areas and fruits and vegetables (F&V) areas in order to identify farms managing cotton/wheat production and those managing F&V/wheat production. This has meant a preliminary assessment and selection of the different districts (Map 5.2). South-East districts are mostly devoted to fruits and vegetables⁹, whereas North-west areas are devoted mostly to cotton. South-West regions such as Nurobod (7) have dry land with not much agriculture and produce livestock and dairy products which has not been object of observation. Western districts such as Narpay (6), Paktachi (9) and Koshrabat (5), have not

⁹ also called High Value Crops (HVCs)

been covered because they enter into the economic sphere of Navoi, a free economic zone which creates different income sources generated from industrial activities which would therefore create error bias in the observations. The interview method consisted of: choosing the district, reaching by phone the point of contact of the area (either an employee of the *hokimiat* or a farmer) and then start the interviews through a snowball process. Farmers have been interviewed either directly in their fields, in their homes, in the tractor parks or in the local administration offices, the *hokimiat*.

Map 5.1: Districts of Samarkand Region



Source: Wikipedia

My survey focused for half on cotton intensive districts and the rest in wheat and F&V crop production districts.

Table 5.3 - Survey respondents by district

	District Name	District capital	Cotton-wheat farmers	Wheat and F&V	Dekhan	Farm workers	total
1	Bulungur District	Bulungur	1	1	14	0	16
2	Ishtikhon District	Ishtikhon	6	1	1	7	15
3	Jomboy District	Jomboy	1	8	0	0	9

4	Kattakurgan District	Paishanba	0	0	0	1	1
5	Koshrobot District	Koshrobot	1	0	0	2	3
6	Narpay District	Oqtosh	1	0	0	2	3
7	Nurobod District	Nurobod	0	0	0	0	0
8	Oqdarya District	Laish	0	6	3	2	11
9	Pakhtachi District	Ziadin	0	0	0	0	0
11	Pastdargom District	Juma	0	8	2	9	19
10	Payariq District	Payariq	6	1	6	7	18
12	Samarqand District	Gulabad	5	2	4	0	11
13	Toyloq District	Toyloq	9	3	0	0	12
14	Urgut District	Urgut	0	0	0	0	0
		Total	30	30	30	30	

Source: Survey

There has been a mid-term review and consequent correction of the objects of observation during the first stages of the survey. At the beginning, the survey focused exclusively on *farmers* managers, for cotton, wheat and F&V. However, soon I discovered that they had relatively homogenous diets, socio-economic status, and power compared to the lower strata of rural society such as farm wage workers and *dekhans*. Although I kept them because they were able to explain the differentiation in market integrations and commercialisation levels, I decided to downsize those two strata to 30 respondents each and to add two further strata to my population analysis, namely farm wage workers and *dekhans*. This is a common solution to improve the representativeness of the sample to answer more comprehensively the research questions (Devereux and Hoddinott, 1992:29). These two additional groups allowed me to expand further the understanding of the differentiations in food access and consumption, rural labour diversification and stratification, and accumulation patterns. Also,

through these two groups I had the opportunity to interview women, who were not represented among farm managers, mostly dominated by men. Finally, the third benefit was that expanding the analysis to non-farm managers allowed grasping the economic relationship among them (Oya, 2002).

Farm wage workers are defined in this research as workers on *farmers* or in agro-businesses, either casual or annual. In this context *dekhans* are defined as farmers who 1) own a plot much smaller than a state-crop farm (on average less than 1 hectare); 2) do not manage the cultivation of any state crops, namely cotton and winter wheat; 3) rely on the sale of their cultivations as a main source of income; and 4) do not rely on other farm jobs as main source of income. In many cases, farm wage workers were also *dekhans*, but such overlapping was resolved once I identified which activity was the major source of income. This classification, or strata selection, allowed me to explore in a more comprehensive way the class differentiation of the agrarian setting with respect to: food consumption patterns, food access, labor relationships, market mechanisms, and gender inequalities (Oya, 2010; Olsen, 2006; Agresti and Kateri, 2011). Overall, this choice has avoided estimation errors. Moreover, these two additional groups shed light on further differences in mechanisms of production and consumption which will be outlined and discussed in chapter 6 and 7. The final stratified purposive farmer survey was composed of 120 units divided into four non-overlapping groups (see table 5.4).

Table 5.4 - Survey sample strata

	Male	Female
Cotton & Wheat <i>farmers'</i> managers	30	0
Fruits and vegetables & wheat <i>farmers'</i> managers	30	0
Farm wage workers	22	8
<i>Dehkans</i>	23	7
Tot. 120	105	15

Source: author

One last comment has to be made about the choice of the unit of analysis of farmers instead of households. The standard category of household, often used in an agrarian surveys, corresponds to the Uzbek term of *Oila*, which consists of an extended family spanning sometimes three generations. The fluidity of members' composition due for example to

migration could have been problematic and prevent to grasp insights into intra-household dynamics (Agarwal 1997; O’Laughlin 2007). Furthermore, for bureaucratic reasons I was not given permission to undertake a household survey but an individual farmer survey. Eventually this has been beneficial for two reasons: it contributed to disentangling intra-household dynamics by avoiding the misrepresentation of the household as homogenous unit with respect to domestic and social divisions of labour or nutritional outcomes (i.e. Kandyioti, 1999). The dimension of household’ labour, although not the core of the research, has been nevertheless captured through specific survey questions about the domestic and ‘professional’ occupation and nutrition outcomes, which are discussed in chapter 7. Also, some of the questions, for instance related to asset index or FANTA -Food and Nutrition Technical Assistance-, captured data and results at the household level.

5.5.1.1 Content of the survey

The survey questionnaire consisted of 87 questions, including the sub-questions, and was thematically divided into four modules: 1) general socio-demographic characteristics; 2) commercialisation indicators for inputs and outputs; 3) asset index; 4) nutrition security (FANTA+ dietary diversity index score) (Questionnaire in Appendix IV). In the sections below I discuss the reasons and modalities of each module.

a. Socio-demographic characteristics

This part of the questionnaire covered standard information on socio-economic characteristics about gender, age, education level, household size and composition, types of farm and off-farm employment. Although it was not used directly in the quantitative exercise, it provided useful information about social trends which could be used for further research. For instance, it is important to know the level of education because it can correlate to higher levels of wealth and thus it adds additional analytical insights in patterns and characteristics of rural poverty (Cramer and Pontara, 1998). However, in cases where the role of the state in those services is almost exclusive, at least at the primary level, it is likely that those variables won’t be discriminatory indicators of class.

b. Means of production, labour relations and market channels

As already mentioned in chapter 2 and 4, in a political economy analysis that looks at class relationships and farmer differentiation, an asset index is not a sufficient tool to assess such classification. Many authors have in fact developed commercialisation indices. Following

Oya's work in Senegal (2002), multidimensional indicators have been included here. Oya suggests an approach in which observations are purposively driven by and looked through the theory chosen and adopted (2004; 2007a). In this section I explain the reasons for the construction of the indices that aimed at measuring the different degrees of market involvement for farmers, in particular access and use of physical factors of production and labour and output channels. Before doing so, I think it is beneficial to recall the main methods reviewed in assessments of commercialisation in different case-studies and discuss how they relate to this exercise (i.e. Von Broun and Kennedy, 1994; Pradhan, 2010). As reviewed in section 2.3.3, commercialisation indices have been usually measured through cross-sectional data (Jaleta. et al, 2009), focussing on specific crops at household level production (Strasberg et al. 1999). Most of the indices look at the ratio of gross *value* of all crops sold over the total value of crops produced, also called Household commercialisation Index (HCI) (Agwu, 2012; Strasberg et al. 1999; Goverech, 1999). This is measured with a value between zero, signalling total subsistence, and 100, when the total of production is sold (Von Braun, 1994). In one of the studies using this tool, commercialisation was seen as a determinant of productivity enhancement and use of fertilizer where income, farm size, distance to market access to credit were statistically significant (Agwu, 2011). Although these are relevant variables, the econometric modelling does not unveil the reasons for such positive relationship. Also, from a methodological perspective, I argued that there are strong limitations in the way in which these tools have been built, particularly with reference to the insufficient attention to the definition of commercialisation, its context-specificity, and relevance of the non-monetary economy.

In particular, these indices hold two main problems in relation to this case-study. First, at the methodological level, *value* is exclusively defined in this literature in monetary terms. In reality, as discussed in the next chapters, many production processes and exchange in this case study are regulated through non-monetary transactions. This means that although they do not have a price, they have 'exchange-values' for that particular production setting. Second, on a substantive level, they reflect the idea that commercialisation is a homogenous causal process of market integration (Strasberg et al. 1999) or a consequence of decision-making behaviours of farmers (Von Braun and Kennedy, 1994) instead of a systemic process driven by multidimensional elements which are shaped by local and external institutional forces, such as the commodification of markets, needs and exclusion. In this case study such measurements would be inappropriate because prices and commercialisation processes are, although non-exclusively, linked to state-led mechanisms of public procurement of output

and input provision for state crops. Therefore 'commercialisation' (i.e. market) is 'realised' only in particular stages of the production and distribution processes and after there has been some sort of 'invisible' transfer and redistribution. Those processes will be further explained in the next chapters.

In view of those observations, in order to grasp modalities of input and market access, two measurements have been developed, one for inputs and one for outputs. Information obtained from Q. 30 (Where do you sell crops?) and Q. 27-28 (state-provided inputs and labour relations) show a different degree of integration into the market but also a different use of input across different types of farmers.

- a) **Output index:** It assesses the different forms of market integration based on different combination of: own consumption; state procurement; bazar; wholesale/processing; company/export.
- b) **Input index:** It assesses the different access and support of inputs and hiring of permanent labour, provided that only farmers producing cotton and wheat have access to state-subsidised fertilisers, seeds, tractors, extension services. Instead, *dekhans* can only buy seeds and certain kind of fertilizers from the market bazar. Dekhans usually do not hire labour, but if they have the opportunity or necessity they sell their labour to *farmers* and then are classified as farm wage workers.

I called the combination of those two indices a 'marketisation index'. Once such differentiation has been discussed, I looked at their correlation with asset index and dietary patterns to try to understand causality through a retroductive analysis.

c. **Asset index to understand the patterns of accumulation**

The fieldwork has demonstrated how in a context characterised by a transition or semi-capitalistic economy where market transactions are thinner compared to urban areas and where agriculture can still be considered a 'state-sector', the definition of poverty or wealth can draw upon, although not exclusively, heterogeneous and context-specific non-monetary variables. For such reasons in this context, it could be more effective to ask "what did you buy?" rather than "how much did you spend?" (Johnston and Sender, 2008). In fact, measures of income rather than consumption or asset ownership have been wrongly used to assess accumulation, especially in low income rural contexts where welfare is often constructed around in-kind transfers, and non-marketed food occupies a big share of the consumption basket. In this regards, as proxy of economic status, the quality of food consumed or the

equipment in the household can be very important and cannot be grasped only by looking at income expenses recorded through monetary values because they often are linked to subsistence or non-market practices (Filmer and Pritchett, 2001; McKenzie, 2005; Johnston and Sender, 2008; Johnston and Abreu, 2016). Many studies based on monetary metrics have indeed often missed important aspects related to dynamic local forces, external labour markets and domestic social structures.

On the other hand, some strands of the literature have been sceptical about asset indices. Howe et al. (2008), raises concerns about the comparability of wealth levels in different contexts. Others warn of the problem that, if assets indices are used to grasp class differentiation and to create wealth ranking, they can sometimes provide “fleeting glimpses” (Johnston and Abreu, 2016:4) because tell us little about the relations of production that explain the class structure. Nevertheless, an asset index can support an understanding of the welfare situation if tailored for the context studied (Cramer and Pontara, 1998) and its comparability capacity is not much worse than monetary measurements (e.g. per capita incomes or poverty lines) because they are also not easily comparable across time and contexts (Ravaillon, 2001). The classification and analysis of the data on socio economic characteristics helps to identify the potential classification of farmers and rural workers in the area. It is indeed widely acknowledged that assets can affect, if provider of symbolic connotation, an indicator of power relations and accumulation patterns. Moreover, in rural areas prices can be lower than in urban settings and in the case of Uzbekistan, where slow price transmission and non-monetary forms of transaction can occur, relying only on price-based metrics would risk overestimating poverty. Also, as formal markets are not fully developed, stagnant and seasonal, an important aspect to understand the low correlation between expenditure and assets is the widespread use of re-sale markets. In cases such as Uzbekistan, characterised by a slow transition towards market-based agriculture, (i.e. lack of land privatization, semi-regulated price of commodities) semi-monetary transaction are likely to affect the consumption and production settings in.

In general, an asset index can involve subjectivity about which asset to include that can be relevant to a specific context. It is a negotiation process between what is agreed as status symbol and national ideas on welfare. For this reason, the analysis has required a pilot qualitative analysis of the relevance and connotation of asset possessions and their subjective role vis-à-vis welfare (Johnston and Sender, 2008). As reference, I have taken into account

asset indicators used in the 2002 national survey in Uzbekistan¹⁰ (Hohmann and Garenne, 2009). Although it has not been asked about toilets facilities (due to the resistance of one enumerator who refused to ask this question) the questionnaire covered all those elements that have been confirmed as very relevant, and added more on other consumer durables, dwelling characteristics, access to services, and animal assets (see Appendix IV for the full list). Some weaknesses in the process need to be mentioned. An asset index is able to grasp a 'having' versus 'not-having' situation, but it does not go deeper to record qualitative aspect. This was clear when for instance recording the possession of a car. This could have been a well-functioning new vehicle able also to serve as a taxi for off-farm season jobs, or an old *Lada* that could only be used for short commuting. Such inaccuracies have been compensated by cross-checking complementary questions. Nevertheless, in this case study the asset index has functioned as a user-friendly, immediate and inexpensive tool which has contributed, if not exclusively, to grasp consumption patterns and wealth indicators. During the process of data analysis, only 12 out of the 30 collected assets were used. These explain more and better the variation of the whole set of assets with respect to the population but also the qualitative differentiation of producers and the appropriateness of the size for quantitative analysis. Data driven weights were assigned to each of the 12 assets through a principal component analysis. After having tried different combinations, correlations with other variables were also observed which are outlined and commented in the next chapters.

d. Dietary diversity, food security and food consumption

The overall scope of this module was to grasp not only the quality of the individual diet for men and women in terms of micronutrients intake, but also to assess the different degrees of diet diversification which can be considered a proxy of dietary quality and diet transitions (Ruel et al., 2013). I have discussed in chapter 3 that political, economic, cultural, and social factors affect the utilization, access, preferences and distribution of resources which translate into food access and consumption (FAO, 1996). I argued that nutritional transitions in the process of economic development can be divergent because it is driven by multi-layered mechanisms (Hawkes et al., 2010). Because of the multidimensionality of malnutrition I need to recognise that none of the methods available are infallible or completely accurate, whether at individual or at household level. The risk of errors due to non-reliability (random) or systemic (bias) is always present. In order to avoid underestimating or overestimating the

¹⁰The survey included: source of drinking water, type of toilet facility, has electricity, radio, television, refrigerator, bicycle, motorcycle, car/truck, floor material, wall material, roof material, telephone

quality and quantity of food and ensure the representativeness of respondents, different types of respondents have been purposively selected from the rural population.

It is also necessary to explain the reasons for not having chosen other tools, such as anthropometrics data¹¹ for body growth (weight and height) composition in either children or adults. The first reason is substantial: anthropometric data do not necessarily reflect food consumption nor energy adequacy because the results could be due to other factors related to health, hygiene or environment (Shetty, 2009). Some case studies have shown no correlation between under nutrition in children and adults (ibid) as minimum nutritional requirement of food might differ just by weight, height and metabolic rates (Gabbert and Weikard, 2001). Anthropometry thus does not unveil neither the effect of a specific nutrient deficiency, nor the causalities. The other reason is pragmatic, data was unavailable and the organizational costs to carry out good anthropometric measurements were not bearable for this research.

Food Frequency is another widely used tool in nutrition research but for different reasons, linked to the reliability of long-term memory, has not been used (Schaefer et al., 2000). At the same time, setting food frequency as an indicator, could be misleading by hinting that 'frequency' is always desirable but actually it is not always an indicator of healthiness (e.g. it is still unclear if eating eggs every day is good for health). There is also high risks of error due to memory bias (ibid). Nutrition security, identified in micronutrient deficiency and diet diversity in particular, can be assessed in a more accurate way through the individual dietary diversity score (IDDS). Although it is believed that IDDS is not a perfect method, being a snapshot of food consumption and therefore unable to provide a dynamic picture of food consumption patterns, it nevertheless provides a basis from which to understand how diet is driven beyond individual preferences and choices. This is because it provides information of the type of food consumed and, through complementary qualitative question, it was linked to food marketisation dynamics. Questions on what was eaten or drunk the day before (24h recall) for breakfast, snack, lunch, snack, dinner, snack, either consumed or produced at home or outside were asked to both female and male farmers involved in the production or preparation of food, through the use of 15 foods groups. In addition, sometimes eating outside the house is a common practice especially for men, therefore it was important also to grasp food consumption away from home (Farfan et al. 2015). For instance, in Uzbekistan

¹¹ "Anthropometrics are measurements of the variations of the physical dimensions and the gross composition of the human body at different age levels and degrees of nutrition "(Jelliffe, 1966).

the *chaixona* (tea room) is the public space where men usually gather to eat, drink tea, and socialise. Exactly in case where there is a high frequency of meals/snack eaten outside the house, targeting individuals instead of household produces more representative and explanatory results. The content of IDDI' food groups has been adapted to the specific context in order to reflect the spectrum of the national diet. For instance, I acknowledged the practice of eating mixed dishes (e.g. *Plov*, which contains different nutritional sources) which were disaggregated by ingredients and food groups.

The selection of both men and women allowed grasping gendered differences of food consumption practices which could serve as platform for future research and, through complementary open questions, an awareness of intra-household dynamics. In addition, the IDDS was analyzed in relations to food availability in the market. In sum, the IDDS proved a useful tool to create a systemic assessment across different classes of farmers regarding what people eat, and why they eat what they eat.

In parallel, questions related to food insecurity were added through the Food and Nutrition Technical Assistance (FANTA) questionnaire to assess the hunger scale. FANTA not only provided a picture on food vulnerability within the household, but, by complementing it with queries implemented in similar research, it provided an additional perspective on the reliance of market and not-market networks for food provision (e.g. Stevano, 2014). Also, questions (46-47) to understand the proportion of household budget destined to food were introduced (See appendix IV). These complementary questions helped to inform the source of food and the relationship with the different markets across the population. I also asked if the respondents buy processed food and if yes, which kind and how often. A question was added about what respondents think is a healthy food to unveil subjective perceptions and valuation of what is considered to be healthy food. Further, additional questions sought information on the qualitative aspects of food consumption trying to identify who controls the family budget. Such material helped to assess systematically the compelling forces driving the self-provision of food versus purchasing of food, in other words the consumption dynamics of the food system.

e. Crop diversity

One last consideration remains regarding crop diversity. Crop diversity was used as an analytical variable to understand the implications of intensification, production marketisation and consumption of food crops, discussed in section 3.2 and chapter 8. Available studies use

different methodologies to assess crop diversity. Some use simple count of the crops. Another methodology widely used is the Shannon Entropy (Shannon, 1948), which shows the weight of richness of species, including food items. An additional measure to assess the commercialisation of farmers is the Herfindhal index. This index is particularly interesting because it is able to grasp the proportion of cash and food crops planted by farmers. The index has a higher value in relation to the size of the land devoted to cash crops.

In this research, crop diversity has been measured through the Simpson diversity Index. The Simpson's index (D) is a measure of diversity, which considers the richness, and evenness of abundance among the species, in our case crops, present in an ecosystem. The Simpson index is intuitively the opposite of a concentration index. The index has been calculated as follow:

$$D = \frac{\sum n_i(n_i-1)}{N(N-1)}$$

where n_i is the total number of organisms of each individual species, N = the

total number of organisms of all species. Simpson diversity index means the greater the value the greater the sample diversity. Here the calculation has been done based on an estimation of the size of the area devoted to each crop (in hectares).

Data were taken from the survey question in which each farmer was asked to list to the best of their knowledge the type of crops produced in the last 12 months on their land, (either household plot- *tomarqu*- for *dekhan* and farm wage workers and *tomarqu* and state-farm land combined for *farmers*). The index does not include livestock. Typical crops produced were wheat, cotton, tomatoes, fruits and different vegetables.

In reality, assessing the level of crop diversity is tricky. For instance, some argue that if one cash-crop is added, it can paradoxically improve crop diversity, at least initially (Sibhatu et al, 2016). Also, it is noted how different crops have different nutritional properties, which affect the outcomes of production-consumption (ibid). In case of non-food crop for instance, the nutritional contribution is negative so in this case cotton can create an opportunity-cost vis-à-vis food access.

For each of those modules, namely dietary diversity (for food security), asset endowment (for wealth), marketisation, and crop diversity, indices have been developed through a Principal Component Analysis (PCA). PCA is a statistical method that summarizes a data matrix in a smaller number of components to emphasize variation and bring out strong patterns in a dataset. PCA has the ability to perform data-driven analysis based on the primary data collected (See Appendix VII-IX). A limitation is that it is hard to compare results between

different datasets. However, this is a problem common in many social science studies, in which context-specific phenomena are often hard to compare.

5.5.2 The qualitative component

As previously outlined, in order to fill the gaps and complement the results that the survey has provided, this research has mixed quantitative and qualitative methods. Auger acknowledges that ethnographic research is very much dependent on the cooperation of the participants (1995). At the same time, uncontrollable practical factors and personal qualities of the researcher, namely knowledge, intuitions and background filter the perception and judgement of reality, and risk to create asymmetrical positionalities. Indeed, humans are inserted in pre-existing roles assigned and resources inherited, with structure influencing purposefully human activities (Brown, 2007). In the case of Uzbek agrarian production I acknowledged how social relationships are embedded and are the result of multilayer structures, agencies, technology and institutions (Polanyi, 1944). These relationships are analysed in a framework of social positions drawing on a structure/agency model rather than individuals and this has important analytical implications. Also, considering that inputs, outputs and labour, which are objects of this analysis, are integrated and inseparable from social relations, the distinction between social power and social activities would be inappropriate in this analysis. The process of qualitative data collection has been carried out under a methodological '*situationalism*', which tries to account for reciprocity among individuals, their power asymmetry and social structure (Campbell et al., 1998). In this sense, there has been an attempt to overcome the distinction of micro versus macro forces.

Also, there are potential ontological misunderstandings that need to be considered when deciding to look at rural and peri-urban producers and consumers. Indeed, source of revenue, in kind transaction and food prices can assume different dynamics. So in fieldwork one should be careful in asking questions about *what?* This challenge is related to the difficulties to capture non-standardised social or economic categories, such as the concept of employment, labour for wage, labour for in kind payment and self-employment, harvesting season, as well on issues on food. The strong role of informal and non-market transactions may result in difficulties in systematising them into the research framework. The qualitative component of the fieldwork contributed to the understanding of the Uzbek rural organization bonded with strong customary norms based on a specific livelihood, history, language and culture. Observations and unstructured interviews contributed to understand how household labour,

the *dekhans*, and village communities interact with the compulsion of exogenous market forces and the settings of the *farmers*.

a. Semi-structured and unstructured interviews

It is impossible to ignore the macroeconomic patterns when looking at food systems. For instance, the role of the state on for instance the commodities' trade or on the agro-industrialization process. These questions have been addressed through in depth and unstructured interviews with high level institutional stakeholders, local administrators, and representative of International Organization to complement secondary data. In Samarkand:

- Samarkand Oblastselkhoz (Provincial institute of Agriculture) (24/10/2015) ;
- Samarkand Raiselkhoz (at district level), the state agency for grain and cotton input supplier (27/10/2015) ;
- Agrobank which issues loans to farmers (25/10/2015);
- Uza Romashservice which rents agricultural equipment (i.e. tractors) (28/10/2015);
- Uzkimyosanoat which sells mineral fertilizers pesticides defoliantes (20/10/2015);
- Uzagrotechservice service farming equipment (25/10/2015);
- Uzelkhoz mashleasing which coordinates the lease of land (29/10/2015);
- Uzdonmahsulot who deals with purchasing distribution and storage of wheat contributed to the understanding of the dynamics behind crops production (29/10/2015).

In Tashkent, the capital of Uzbekistan, with:

- FAO representatives (18/08/2015);
- WHO national nutrition specialists (19/08/2015);
- UNICEF Social protection Officer (19/08/2015);
- CER programme officer Mr. Bakhodur Eshenov (20/08/2015);
- University World Economy and Diplomacy (20/11/2015);
- Ministry of textile (22/12/2015).

I have also conducted semi-structured interviews with some of the three main agribusinesses in the Samarkand province (25/08/2015 and 27/11/2015) in order to: a) grasp employment patterns; b) look at the pattern and source of capital in rural areas; c) assess the different

degree of mechanization in the food industry; d) assess the circuits of contract farming; e) Understand the broader policy trends (Guideline questions in Appendix V).

b. Focus group

The focus group did not address directly the research question, nor did it cover the same categories of people included in the survey. However, it helped to inform the background story and some secondary aspects of the research which are crucial in the Uzbek agricultural-food system. To conduct my focus group with university students, I contacted a lecturer of Italian at the University Of World Languages Of Samarkand. I asked her if I could be a guest lecturer during her Italian class and asked for her permission to ask some questions about food consumption. The students were a group of 16 people, mostly girls between 18 and 21 years old all living in Samarkand but coming also from rural areas. We started talking about their food preferences and as they were very responsive I discovered interesting insights about their experience with picking cotton. They described that experience in a way that I did not expect. They obviously said it is tiring but there are also funny moments and occasions for socialization. Furthermore, the lecturer became an important informant during my fieldwork. She defined herself as “not the typical Uzbek” in Samarkand; she was 24 years old, mixed-ethnicity (half Russian- half Uzbek), living in an urban educated female-only household, with no intention of getting married soon, and had her own job and access to the money she earns. The unstructured conversations we had helped me understanding the role of gender in the Uzbek society.

c. Participant observations

During my stay in Samarkand, when I was not busy with the survey, I interacted with different kinds of people, through which I captured glimpses of relevant intergenerational, gender and intra-household dynamics related to food and labour. Such meetings occurred in random ways through daily life episodes such as taking a taxi, going to the bazar etc. Similar opportunities arose during the survey. To observe relevant centers of distribution of food, namely different market channels, I visited the bazars (wet markets) where I collected prices at different point in time (table in appendix VI). I have also visited bigger ‘western style’ supermarkets to check whether new or more expensive products were sold so to identify potentially new urban consumption patterns. Through the observation at the *bazars* and supermarkets I was able to cross- check prices and product availability. Some respondents

showed peculiar characteristics relevant to answer the research questions. Hence, a couple of life histories were also collected. In Tashkent I lived with a family of Samarkand's origin, and conducted some participant observations which helped me to build a diary where I reported experiences and perceptions about food sharing, women's labour, male aspirations and any kind of particular events or phenomena that grabbed my attention. These observed intra-household and farm dynamics have been important to understand consumption of quality food and intake differences among gender and generations, even if not generalizable.

5.6 Strengths, limitations and concluding remarks

5.6.1 Sampling errors and remarks

As the size of the sample is relatively small, one can argue that the results would not be validated for the wider population. However, the small variance within the groups shows homogeneity of the sample strata with respect to the target population, so it is believed that the findings are meaningful and be representative of the population segments of interests in this exercise. Nevertheless, it has been argued that it is also true that the size of the population has no actual impact on how well the sample is able to describe the main dynamics within the population as long as the included variables are relevant and significant characteristics are unveiled (Oya,2002). Finally, the sample was the result of an accurate reflection about the feasibility of the exercise, given the available time and budget. Thus, it was decided that in order to achieve statistical significance for all the strata, at least 30 units should be interviewed for each. Johnston (1997) states that while large surveys may offer good statistical numbers, it may not offer significance with regard to the set of dynamics within the community.

Because I was participating directly in the process of data gathering, I witnessed to many occasions in which the farm manager and farm workers interact. While sometimes the relationship was clearly asymmetrical and the manager tried to patronise or control the workers, in some other cases I perceived a sense of collaboration intrinsic to the community, where farm wage workers were not only in a labour relationship but also were nephews or neighbours. In those cases, the farm manager was operationalising the role of employer and buyer of their labour force, but he was also a relative, a community benefactor, who provides wage 'premiums' at the end of the seasons and wealth to the *mahalla*. Indeed, the quantitative data have been cross checked with more qualitative elements through unstructured interviews, and the overall results and trends seem not to contradict each other.

The response rate was very high, considering that we were approaching farmers for interviews during working time (daytime) and mostly directly on their fields, or working site. Only few people refused or abandoned the questionnaire due to lack of time and when obviously biased responses were answered, for instance when the respondents was evidently 'mis-reporting' or 'inventing' data, the questionnaire was suspended. Out of 120 interviewees, 16 respondents were female which have been randomly selected. Although the number is not high, it signals a characteristic of the farming sector. Among farm managers, no female was interviewed which shows the reality that among the more powerful strata in the population, women are rare.

It is widely accepted that in some agrarian contexts it is difficult to draw a clear line between rural labour for subsistence and labour exchanged for cash. This is particularly the case for women. For instance women bake *lipioshka (bread)* at home for home consumption but it is also often sold. Cebotarev (1984) divided productive and unproductive activities into 9 major groups: (1) meal preparation; (2) house / kitchen cleaning; (3) clothes – cleaning, sewing, repairing; (4) child care; (5) garden and animal care; (6) fetching wood and water; (7) household industry / commerce; (8) remunerative work; and (9) resting, visiting, etc. Other interesting variables for this research are for instance the *location of the activities*: whether the work activity is carried out within or outside home; *for whom or for what purpose*- self-consumption or for sale, for government, private corporation/company, public undertaking; *with whom*: for example, whether the activity is performed with children / adults or with household member / non-household member, etc.; *type of activities*: whether the activity is paid or unpaid or whether the activity is the main or the secondary for the performer, etc. (Hirway,1991). Some questions built around those categories were included to shed light on how gender lines play out in paid and unpaid work, especially in relation to production of agricultural and subsistence goods. In general, in assessing how commercialisation processes affect nutrition and social reproduction modalities at large, it is impossible to ignore informal domestic activities, which sometimes can represent a bigger proportion of food provision than paid formal work. These patterns will be explored in chapter 7.

5.6.2 Non-sampling errors and final remarks

Some questions were not clearly understood by the interviewees, for instance

- *Q.16 Do you spend more time on cotton or other crops?* Most of the interviewees struggled to answer because they never quantified the exact time spent on the two types of work. Most of them answered that they work on a daily basis more on state

crop (8 hours), than in the *tomarqua* (2 hours) but if the time frame is extended to other seasons maybe the quantification will be different.

- *Q.17: Do you rent your land?* The question felt redundant as 98% lease land from the state for a period of 49 years.
- *Q.26 on type of irrigation:* this question was not strictly relevant but nevertheless documented the introduction of pumping and technology.

Some of the questions worked very well. The asset index (Q.39-43) unveiled sharp differences, for instance, in the heating methods or house facilities between managements and workers. Also the animal asset indicators, have potential important implication for nutrition being (if not sold) the most direct source of animal proteins. Lastly, Q.12 on remittances, unveiled that only two out of 120 farmers declared to receive remittances from abroad. This is due to the strong crisis that hit Russia in 2013-14, which led many migrants to return to the country. This information helped to ascertain that there were not exogenous income flows altering household welfare farmers.

The identification of the *enumerators* is a crucial step in fieldwork. As I was one of the few foreign independent academic researchers authorized to conduct a rural survey in the country (besides International Organizations), I did not have the opportunity to refer to previous experiences or to be introduced to an already experienced collaborator. At the same time I did not want to rely on an external agency. It was hard to identify a team that could speak a decent level of English, had sufficient knowledge of the research topics and had previous experiences in surveys. Many of the most experienced university staff were busy with their own activities, so in October I identified a male PhD student at the Agrarian University of Samarkand who could help me. Since he was very busy teaching and because of the time constraint given by my short visa, I needed an additional assistant, and I recruited a master student in Economics. I had met her in August and I knew she could speak some English, she was intuitive and intelligent, and already knew the purpose of the questionnaire. She was also a woman, which made the experience interesting from a gender perspective. The triple subjectivity among the enumerators, the interviewees and myself was different with the two enumerators. Overall, the Msc student enumerator (female) interviewed 65 people, whereas the PhD student enumerator (male) 55, including the pilot interviews conducted in August.

During the process of data collection being a woman raised specific questions. Respondents frequently asked during the interviews if my female enumerator or myself were married, how

old we were and if we had children. Being married in Uzbekistan gives social legitimacy to women, which shows the conservative pressure on women. Thus, this context could affect the power relation between the female research assistant and respondents (England, 1994; Harding, 1987). Nevertheless, I have noticed that the majority of respondents felt more comfortable with my female enumerator in answering delicate questions than with the male enumerator, for instance about food security. The relationship between me and my enumerators developed in a different way. First, there was an employment relation, which generated asymmetry given by the economic conditions (Molony and Hammett, 2007 in Deane and Stevano, 2016), but also in my case expanded to other forms of cooperation and coordination, which evolved differently with the two assistants. The bond with the male enumerator was created based on the similarities of the research (he works on water management in cotton farms) which nevertheless generated in some cases some difficulties (at the beginning without explicitly asking he was simultaneously conducting his own questionnaire with the farmers which created 'need for clarification'). In contrast, the relationship with the female enumerator was reinforced by gender solidarity. She became my confidant throughout the research but became also a reliable source of information about women's conditions in the city of Samarkand (she is from a village in Nurabod district) and subsequently an insight for my research, which definitely blurred the line between employer and employee and researched and researched (Turner, 2010). In conclusion, having had two enumerators allowed to counterweight the dynamics that could emerge from gender bias but also unveiled interesting information that contributed to the process of the data collection. There was a third important element of the team during the survey, the driver. He was a middle age teacher at the Samarkand Agrarian University who was the gate keeper for getting trust of the hokimiat (local administration) when looking for farmers.

It is often assumed that the process of selection of the respondents relies heavily on networks (Oya, 2003; Dattalo 2008). This may have consequences related to independence and reliability of the answers (Cramer et al. 2014). As mentioned, in this research the process of selection of the respondents occurred through a snowball process. I have tried to keep the process of selection unbiased, especially when looking for farm wage workers and also when *dekhans* were added to the survey. Nevertheless, because snowballing relies on proximity, it has been hard to approach the most marginalised people for interview. We approached farmers in their fields. As already mentioned, sometimes a farm manager refused to let us interview the workers. When it has been possible, I had to make sure that the answers were not conditioned by the presence of the boss. For instance, the enumerators and I entertained

the manager or kept him distant from where the interviews were taking place. The enumerators and the driver received their compensation in dollars, as agreed at the beginning of the project.

The questionnaire was initially translated from English to Russian. However, during the pilot it has been observed that in rural areas young farmers speak Uzbek, therefore an Uzbek version was added. 95% of the interviews were conducted in Uzbek by the two enumerators. Where possible, which was when the respondent was usually older, meaning that he/she went to school during the Soviet period, I conducted the interview in Russian. In those few cases I had the opportunity to expand more on some questions and ask side questions. Most of the interviews with stakeholders were conducted in English and some in Russian. The focus group with the students has been conducted mostly in Russian and English. The enumerators were native Uzbek speakers and were trained to guarantee the homogeneity of the interviews.

Although the initial ambition was to catch the summer season as one of the peaks of labor intensity given by the cotton harvest, due to delay in the authorization process, the survey started right after the cotton harvest (end of October) which also overlapped with the sowing of winter wheat and almost with the end of Ramadan (17th of July 2015). The survey ended in winter, on the 20th of December. From a food security perspective, the survey was conducted during the transition to the harsh season (winter). The delay allowed me to capture other insightful information such as the nutritional outcomes in harsh seasons, the cultivation of meaningful winter crops such as winter wheat, the processing of cotton, and the cultivation of other vegetables. The farmers nevertheless answered the questions about crops production and commercialisation by covering a 12 month timeline, covering therefore the recently-passed cotton season. Not last, because in Uzbekistan inter-regional mobility of the farm wage worker is rare, there was no particular season when to observe labour migration. In fact, the demand of seasonal labor reaches a maximum during the cotton harvest and is mostly supplied by university students mobilized from the same district as it will be explained in chapter 6. Wage labor is generally supplied by neighbors in the village.

In conclusion, by acknowledging and explaining the multidimensional and cross-cutting aspects of the object of study of this research it has been argued that a mixed method was identified as the best way to answer the research questions. The so called 'Q squared approach', is suitable to understand the evolution of the social relations of production in the Samarkand Province through a political economy framework. I highlighted how the process

of designing the methods and data gathering has been a 'trial and error' process. Triangulating the quantitative exercise with the qualitative data obtained was not easy and has its limitations. Nevertheless, rigorousness, consistency and intuition can compensate for the uncertainties intrinsic to primary data collection. This research methodology supports the understanding that causal relationships and events are the outcomes of different and multiple interactions (Bhaskar, 2007). As such, relying on multiple tools seems a reasonable way to detangle relevant mechanisms and explanatory variables.

Chapter 6: The agrarian commercialisation in Uzbekistan: means of production, market channels and agrarian class differentiation

"Irrigation, mechanization, the introduction of fertilizers and hybrid seeds, and other novel technologies that lead more or less directly to economies of scale, tend to lead simultaneously to inequitable land redistribution. It cannot be assumed that the landless labourers and small farmers created by this process will be able to make up consumption shortfalls by taking up new (adequately remunerative) jobs made available through technological advances" (Fleuret et al., 1980)

6.1 Introduction

In this chapter I identify the causal mechanisms that affect, directly or indirectly, agrarian class differentiation. I look at how different groups of farmers access the means of production and the market channels. This analysis will be able to untangle different patterns of production, distribution, and exchange. However, before looking and interpreting the results, it is necessary to recall the relevant points raised in the theoretical debate. In section 2.3 I have identified different points that could contribute to frame those issues such as:

- a) Commercialisation processes do not give a unique straightforward result but give origin to always new and different nature of classes and relations of production and exchange. In this sense transition to capitalism needs to be understood and investigated both as an effect and a process;
- b) The categories of class and market organization and structure are complex and context specific;
- c) The strengths and limitations of theoretical frameworks and methodologies adopted so far to analyse similar dynamics in other contexts. Different categories have been used to assess class differentiation: land size, labour hired (versus family labour), sale income, animals and assets owned (e.g. Lenin, 1967; Patnaik, 1999; Wegren, 2011; Oya, 2004). This exercise is based on multidimensional factors identified inductively and interpreted retroductively;
- d) The role of money versus non-monetary wealth and its nature in relations to welfare and capital accumulations (e.g. Byres, 2003; Hart, 1989);
- e) The role of the state in shaping classes and markets, for instance by purchasing agriculture surplus and by supplying agriculture inputs. This case study contributes to the understanding of how state-market synergies affect commercialisation processes and social relations.

There are two main approaches adopted in this setting and discussed in section 4.2. On the one hand, the deductive neoclassical which recommend liberalization reforms under presumptions of market efficiency and perfect competition. On the other hand, the one

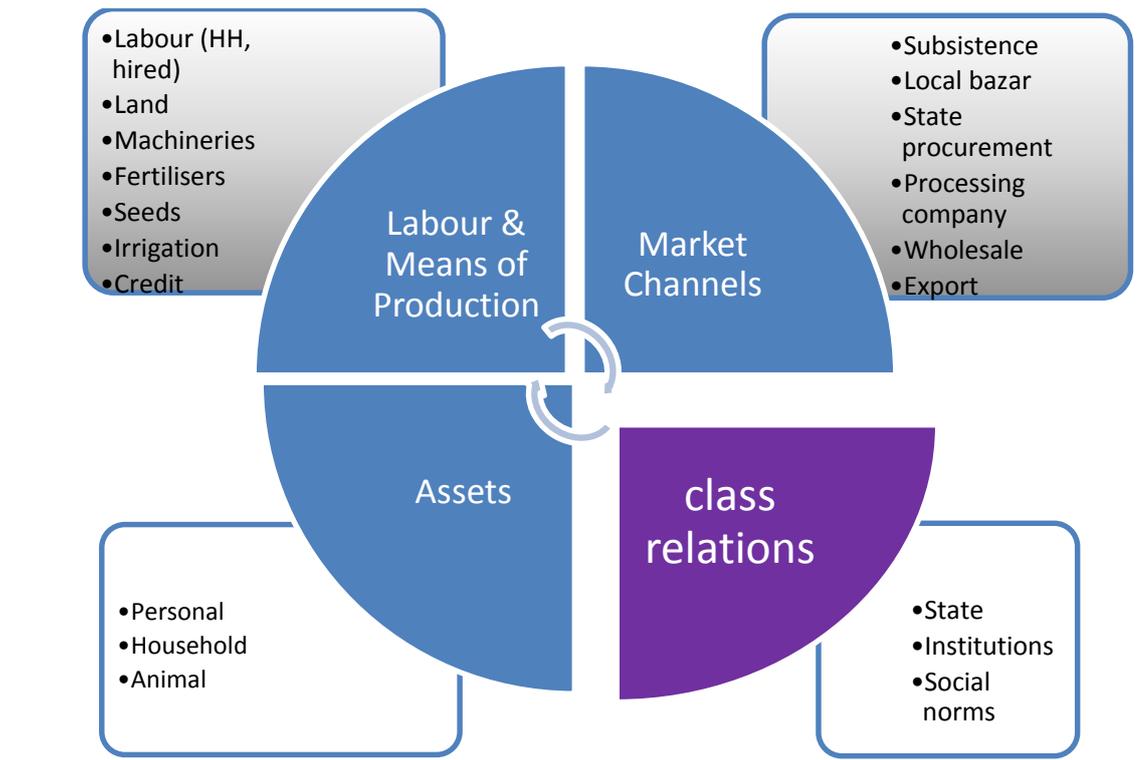
which emphasises the importance of understanding historically embedded pre and post-Soviet norms which manifest in forms of trust, favours (*blat* in Russian) and reciprocity and to collective responses or by maintaining a sort of 'moral economy' to absorb market risks (e.g. Trevisani, 2008; Kandiyoti, 2003; Scott, 1976; Polanyi, 1944; Elman, 2014). They have described a lost sense of communality among the rural peasantries due to the abolishment of the collective farms. In the Marxian sociology, it is observed that in history the perception of the individuals belonging to a whole disappeared with the advent of the private property and it was replaced by the category of class. This research rejects the methodological individualism approach and the idea of *homo-economicus* driven exclusively by profit maximization leitmotifs (Oya, 2004) on which neoclassical economics is based. Thus, the new forms of organization and agencies have to be understood in a capitalistic driven structure which is filtered by old form of collective practices. It is argued that the changing social relations of production are shaping new class relations which are nonetheless filtered by non-economic factors.

Finally, to understand how agrarian transition to capitalism occurs in this case study, I recall the debate on *modes of production*. As discussed in section 2.3 and 4.2, modes of production are the result of ownership relationship. More than one mode of production can coexist and overlap between new and old ones (Patnaik, 1986; Nadkarni, 1991; Byres, 1996). Aware of the Soviet heritage, in Uzbekistan the transition to capitalism entails: a) To produce for sale rather than for own use; b) To hire labour as opposed to rely on family labour; c) Mediation by money, credit and/or increasing monetization of transactions; and d) The generation of surplus value as source of capital accumulation. Thus, the literature suggests that it is important to investigate how and why rural classes differ in their:

- 1) labour relationships and forms of exploitation (i.e. cash expenditure or wage payments);
- 2) Degrees of market orientation (commodification) both for inputs and outputs;
- 3) Intensity and utilization of modern capital good per acre of farm land;
- 4) Patterns of wealth accumulation through assets.

These factors will unveil the process of class formation. Based on this observation I will identify whether dynamics of commercialisation in agriculture are occurring. Diagram 6.1 helps to visualize those elements.

Diagram 6.1- Multidimensional class analysis in agrarian Uzbekistan



Source: Author

In order to grasp the differences among the variables described in the above matrix an input index (labour + means of production), an output index (market channels) and an asset index have been developed. The reasons and motivation for the construction of this analytical tools have been explained in chapter 5 and compared with the methodologies implemented in similar research of agrarian class differentiation in chapter 2 and 4 (Wegren, 2006; Oya, 2004; Bargawi, 2009; von Braun and Kennedy,1991).

As already mentioned in chapter 5, those tools are not been exempted from methodological critiques, such as for instance the scale, significance and/or the external validity of the results. However, previous research proved that agricultural labour market is under-estimated by large-scale representative survey (Oya and Pontara, 2015). In particular it is outlined how rural labour complexities are hard to uncover through large-scale survey questionnaire, for example on their multiple forms of employment, payment patterns, recruitment patterns and working relations (2015:332). Those alternative approaches create the need to scale-down the focus to obtain a more detailed reality through a smaller scale survey such as the one carried out for this research which has covered 120 farmers. Moreover, by admitting the limitations of an analysis based on pure quantitative categories, qualitative material from

survey' open questions, observations and interviews with various stakeholders have been included in the analysis. Furthermore, Burja explains how indices describe different statuses however, do not unveil the relationships among classes (2006). For this, some relational indicators have been included in the construction of those indices (e.g. labour hiring and payment methods) (Oya, 2004).

This chapter will look at the operationalisation and marketisation of different crops's production, and explore through their variations the ways in which farmers engage in commodity relations for their social reproduction and/or accumulation patterns. In conclusion, those indices serve the purpose of analysing the nature of social relations of production and patterns of class differentiation, as well as whether resources are accessed through the market or mediated through government interventions. The attempt is to develop a comprehensive and empirically-grounded analysis which unveils different relations with the means of production and mechanisms of commodification and eventually, capture the patterns of agrarian transformation. The chapter proceeds as follows: section 6.2 looks at labour differentiation dynamics and means of production. Section 6.3 will assess the different types of commercialisation through different market channels. Section 6.4 will analyse patterns of asset accumulation. 6.5 will conclude.

6.2 Labour and Means of Production

Based on the mapping reviewed in the literature in chapter 4.2.1 (e.g. Djanibekov et al., 2012b, 2013; Trevisani, 2008) and on fieldwork data, the table below shows the inductively-driven stratification through which farmers have been classified for the survey exercise. This section will untangle the rationale behind such classification. It will classify and retroductively discuss different access to labour, land and physical inputs.

Table 6.1- Farmers categorization

Strata	Cotton farm manager	F&V Farm Manager	HH farmers (dekhan)	Agricultural Wage Workers
State procurement /market	Cotton and Winter wheat	Winter wheat	n/a only Market	n/a only market
Fom of labour	Family/ Hiring	Family/ Hiring	Family / off farm employment	Family/ Hired in agriculture
Land tenure (title)	Long-term lease	Long-term lease	Lifetime inheritable	Lifetime inheritable
Average Ha	59	32	0.27	0.21

Source: Author’s elaboration adapted from Djanibekov et al. (2012)

6.2.1 Labour

We have seen that one of the category used by authors to differentiate agrarian classes is through their labour relations. Nevertheless, we know that labour markets are structurally differentiated by space, time and socio-political contingencies. If we analyse the categories observed in this case study, we can note how the scenario is very heterogeneous which confute the assumption of homogeneity of labour markets. The problem with classifying labour in poor rural settings has been discussed in chapter 2. In this context, labour relations are multiple, passing from the permanent skilled wage labour employed in HVCs, unskilled permanent, seasonal, daily, family paid or unpaid work, and not least the coercively mobilised forms of labour employed to harvest cotton between September and November. Some strands of the literature which look at forms of labour in developing countries challenge the dichotomy of ‘free’ *versus* ‘unfree’ or forced labour and instead point out that there are different and more complex degrees of coercion put in place within relations of productions (e.g. Morgan and Olsen, 2014; Lerche, 2007). Having said that, the social and political dimension of forced labour is not the focus of this research which instead looks at the differentiation of agrarian production and effect on food consumption. In this section I analyse the different types of labour involved in the state-farms (i.e. *farmers* cultivating cotton or wheat and wheat and F&V) and in *dekhans* and the implications for class differentiation.

The presence of wage labour suggests the existence of an under-developed form of *commercial* labour market, although such labour relations are not always, or not exclusively, occurring under profit-maximising systems. Among *non-permanent* workers there are various types: *seasonal*, who are employed during the cotton-picking seasons, or for fruits and *casual*, who are sporadically employed as casual labour for specific farm activities as *tractorist* or plough operators or off-farms jobs such as sellers. Those figures are able to benefit from jobs offered by bigger, richest and diversified farms. However, as observed during the survey interviews, some rely as well on wage labour themselves, for instance when producing grapes.

For cotton, labour is mobilised from the education sector (including university students) or public administration sector. The GoU arranges travels and provides very basic shelters and meals during the cotton campaign. For the scope of the survey it has been decided to include students under the category of seasonal workers because, during my fieldwork investigation, it has been acknowledged that there are no substantial differences between the daily wages paid to students and to those who are hired in the 'free-market', mostly women recruited through proximity and networks. From a 'production cost' point of view, besides the 'saved' costs in logistics and recruitment borne by the government, farmers do not face much difference between the costs of wages given to local women as opposed to students. Fieldwork observations suggest that the farm manager hire on average 3 – 4 people per hectare to pick cotton. Based on survey interviews, the standard daily wage is between 18,000 and 20,000 sums per day (4US\$ in 2015), or 240 sum/kg of cotton picked, which in practice means that every worker gets paid per piecework.

There is a difference with regards to productivity and skills: girls are in general slower and less productive than men. From the data gathered through focus groups, girl students felt they did not pick enough cotton. However, they said that food and shelter was provided regardless of their performance. That means that to get the 20,000 sums per day as farmers' respondent usually declare them to pay, seasonal pickers will have to pick around 80 kg. According to the focus group, the minimum amount students would pick daily is 21 kg, and it corresponds to 5000 sums which raise questions about the reliability of farmers' declarations. Nevertheless, on top of such potential wage differentials, from a worker's point of view, the level of coercion is different because for women recruited in the village there is not physical displacement. Such findings are relevant for the debate of 'modern slavery' or labour unfreedom (e.g. Mezzadri, 2016) and raise the need to investigate further the epistemology

of ethics of labour and hiring conditions in contexts of agrarian transition. Nonetheless, this falls beyond the scope of this research.

Another labour category observed is *permanent* workers. This category is the most qualified and specialised type of labour among all the other categories. They are often employed in the most capital-intensive farms, namely F&V productions. It can be therefore confirmed that the type of labour demand and use is linked to the organic specificity of the crops produced. Particular crops, such as fruits, require high-skills tasks although the wage is not much higher than unskilled labour (Oya and Pontara, 2015:58; Dyer, 2004). If we link this to the fact that big farms rely on family labour, it can be stated an unclear relationship between capital accumulation patterns and social division of labour. Nevertheless, when trying to assess which are the farms that hire more labour, the survey results seem to confirm the hypothesis that capital intensive production comes along with higher labour employment. As shown in table 6.2, cotton farmers rely more on seasonal than permanent labour and there is a direct relationship with the land size, which is usually bigger for cotton crop fields. On the same note, fruits and vegetables (HVCs) *farmers* usually rely on a bigger proportion of permanent workers, being HVCs generally more labour intensive, and conversely on less amount of seasonal work which is specifically recruited for the cotton picking season.

Table 6.2- Seasonal and permanent wage labour

	Seasonal Workers				Permanent workers			
	Mean	Median	Maximum	Minimum	Mean	Median	Maximum	Minimum
Farmers: cotton/wheat	16	10	100	0	6	0	35	0
Farmers: HVC/wheat	45	30	130	10	5	4	15	0

Source: Author's survey data

A further type of labour that needs to be included is household labour. From observations and survey data, family work is spread across all the agrarian production units, both *farmers* and *dekhans*. It is also confirmed to be the most immediate and effective vehicle of subsistence, especially when off-farm jobs opportunities are unavailable (unstructured interviews with Dekhans in the Bulungur village; chapter 2). Most of the farmers, at all levels, rely on sons, nephews and also wives to work their land. In this scenario labour, being unpaid, is not a cost in the rationale of accumulation. Also, the assumption of profit maximization that sees marginal product of labour equal to wage rate is here disproved. However, looking at the survey data, table 6.3 shows no statistically significant correlation neither between the

size of the household and labour hired, nor between land size and household size. Therefore, although the debate on optimal land size and labour productivity is not the scope of this research, nonetheless these results discredit the household size as the determinant of production relations and suggest that multiple complex institutional factors need to be taken into account. For example land size can be incidental or regulated by central state planning as in this case. Thus, it is appropriate to be cautious about building regularities and causality relations between these variables and assess the system of farming as a whole (Sen, 1962).

Table 6.3- Correlations size of HH and labour employed

		size of HH	farm hectares	seasonal	permanent
size of HH	Pearson Correlation	1	-.043	.064	.048
	Sig. (2-tailed)		.645	.488	.605
	N	120	120	120	120
farm hectares	Pearson Correlation	-.043	1	.653**	.454**
	Sig. (2-tailed)	.645		.000	.000
	N	120	120	120	120
seasonal	Pearson Correlation	.064	.653**	1	.277**
	Sig. (2-tailed)	.488	.000		.002
	N	120	120	120	120
permanent	Pearson Correlation	.048	.454**	.277**	1
	Sig. (2-tailed)	.605	.000	.002	
	N	120	120	120	120

** Correlation is significant at the 0.01 level (2-tailed).

Source: Author's survey data

Nevertheless, if we insert such family-based production in the debate on 'peasant production' versus 'capitalistic production', this case study disproves the neo-populists thesis of family labour being more productive, resisting the profit pressure, and peasantry disintegration. In particular, while it is reasonable to assert that lack of off-farm opportunities could incentivise higher yields at the household level however, that depends on many factors such as price incentives, technical composition of production and land quality which is very context specific and thus difficult to theorize universally. In this case study evidence suggests that the degree of involvement of family labour, across different farms, does not depend on the fact that external labour is hired. Instead, interviews and primary observations suggests that the ratio of family labour depends mostly on the opportunity-cost of available wage-labour outside the farm. In other words, the condition of underemployment, the lack of a solid monetised market and the unequal yet 'socialised' access to land, do not offer an immediate motif to substitute family labour with the hired one.

Furthermore, in a situation of abundance of labour supply, wage levels can be even lower than levels needed for subsistence. Finally, the small land distributed by the government, namely the *tomarqua*, provides *dekhans* with the basic access to food for social reproduction, rural wage have a deflationary pressure since they do not have to cover the entire living costs. This empirical evidence proves the complexities of the processes of labour commodification and how degree of commercialisation and transition to capitalism are highly mediated by non-market dynamics. Family farmers here bear the cost of productive and reproductive labour while keeping low level of consumption (Bernstein, 2010). Paradoxically, such situation could be reinforced or even worsened if a 'land market' would be introduced. It is likely that *dekhans* would start selling their labour *and* their small plot as cheap commodity which, again, could drive downward wages (Kautsky, 1988) and temporarily create a class of landless rural poor. It is argued that, the current system perpetuates conditions of semi-proletarianisation and have positive effects for food availability and stability in the market because does not boost or shock local demand and supply of food. This point will be further developed in chapter 7 and 9.

To understand the complexity of class relations and their implications for social reproduction, it is important to analyse the forms of payments and transfers present in the case study. Those are multifaceted and tailored case by case, making them hard to standardise. In fact, similarly to the Chinese case and to other post-Soviet countries, in Uzbekistan the de-collectivization process has affected the evolution of rural wage employment in the rural economy, and the sale of the labour power is still mostly subject to informal contracts (see Zhang, 2013; Trevisani, 2007 in section 2.3 and 3.2.2). Based on the survey results, they can be distinguished in monetary monthly, monetary daily, in-kind, land or combinations of those. These forms depend also on the different relations of proximity between the hired and the employers: from the fieldwork, it has been acknowledged that often it is the neighbour or the uncle who hires. Labour relationships are almost never driven by impersonal relations. This is due also to the limited mobility capacity (poor rural households do not have cars and internal urban migration is regulated by the state), thus very often workers are isolated and eventually labour is found within the village. The informality of the wage relationship makes the methods of payment also more informal (Cramer et al., 2008). In the survey, results show that 90% of the workers received their payment, wholly or partially, in kind. Farm managers compensate workers in land (usually after the harvest season), in wheat, or in mixed forms of money and wheat and/or other farm crops. This non-monetised methods of payment, as discussed in chapter 4, hampers the accumulation and circulation of money, not only for the

purchase of basic assets, either personal, for the household (i.e. car, fridge..) or for the workers, but also to purchase means of production through credit. Conversely, it can be assumed that farm managers tend to keep money for productive investments. Below, excerpts of *farmers'* life stories will provide empirical insights of rural labour relations.

Oybek is a farm manager. He lives together with his wife, brothers and four children in a village of 80 km north of Samarkand, predominantly cultivated with cotton and wheat. The farm was established in 2006 when he is was 29. He has a relatively small plot of 34Ha where 20 hectares devoted to winter wheat and 14 to cotton. He employed 30 workers just to pick cotton between September and November by paying them 20000 sums (4\$) per day and 2 t of wheat, his wife works in the farm as well; his brother works for a local business company. He sells 20% of the wheat to the bazar for 1000 sum per Kg and 80% through the procurement system to the state for 400 sums/kg¹².

Chori is 58 years old and manages a farm of 35 Ha since 2001. He lives in a household of 10 people. Both his three sons and respective wives and children live with him. One son works in the local bank and one as a teacher in a high school. His wife is retired but still works in the farm. Such life story suggests how it is important to understand that in a context where more than one generation and more than a breadwinner contribute to the household welfare, standard household survey would not be able to grasp such complexity. He hires 5 permanent workers for 200.000 sums per months and 50 seasonal workers to pick cotton (17ha) (240 s/kg of cotton) both students and women. He has also a family farm of 0.35 ha with many fruits and vegetables for self-consumption.

Turdiiev is one of the 'benchmark' farm manager identified in the survey. He is from Ishtihan district and manages 273 hectares of land. He is also employed in a business 'Faizobod' where he makes 800.000 sums per months. His land is situated in two different locations: the first (89Ha) is in an irrigated area where he produces wheat and cotton, the other is cultivated also with wheat and other food crops, melons, nuts, potato, vegetables but in a non-irrigated area. According to FAO, such kind of big land concessions are given by the local administration to farmers who are able to invest in pumping and other technologies, so in this case entrepreneurship is considered a criteria of selecting beneficiaries of land. He hires 60 seasonal workers and 6 permanents other than having his wife and 4 sons working in his farm. He pays the seasonal workers only in wheat, no money. The picture gets more

¹² from fieldwork procured wheat were sold to the state at 400-500 sums per tons as opposed to commercial bazar at 800-1000 sums per tons

complicated when looking at the farm managers involved in the fruits and vegetables production. Usually are involved in integrated system of food processing within the agro business sector, but also sell HVCs through different market channels.

Omid, a farm manager producing wheat and F&V in the region of Samarkand owns 100 cows and a processing factory of sausage where he employed more than 80 workers with an average wage of 600,000 sums per moths (and 20,000 per day for on call workers to harvest peaches). Wages then varies depending on the task. He also exports peaches to Russia due to his good storage capacity.

Those stories help to stress the heterogeneous conditions among different farm producers and their demand for rural labour, their highly fragmented seasonality and engagement with different sectors (Cramer et al. 2008). *Fermers* are at the epicentre of a huge share of the labour market in rural Samarkand. Last but not least, this case study confirms that in rural areas jobs are not mutually exclusive. Many interviewees have multiple occupations and invest in different agri-rural activities to complement and increase their sources of income. Thus, informal labour is a common practice when *dekhans* need income for social reproduction, and very often sporadic and precarious jobs characterise the labour market to compensate agrarian production seasonality (Bernstein, 2010; Oya and Pontara, 2015). Although the survey was not focusing on the labour market, it would appear that off-farm opportunities from the private sector are still limited in rural markets.

From data gathered during the survey interviews i.e Q10: “Which job is the main source of income?”, results shows that the great majority of the off-farm jobs in rural areas are either in the public sector, (e.g. school, nursery, police or local administration) or in the form of petty traders and petty services (e.g. taxi, truck drivers, builders, small repairs, small shops/food). Moreover, the “Statutes on the passport system in the Republic of Uzbekistan” (26 February 1999) regulates the system of residential permits –*propiska*- which limits people mobility¹³ between rural and urban areas¹⁴ where more labour opportunities might be available. This limitation to internal migration, it is argued, exacerbates the reliance on forms of subsistence for social reproduction because it limits the possibilities of diversifying earnings and work’s opportunities. Such interventions in the labour market contribute to explain the persistent conditions of underemployment and the low opportunity costs of the

¹³ <https://www120.secure.griffith.edu.au/research/file/c1354679-4854-4e9d-a6f6-bf43fe182501/1/2015-07-socio-economic-consequences-of-labor-migration-in-uzbekistan.pdf>

¹⁴ Ngo claims the right to freedom of movement and choice of residence within their country: see report http://www2.ohchr.org/english/bodies/hrc/docs/ngos/UGFHR_Uzbekistan98.pdf

current system of subsistence and informality mentioned earlier. In conclusion, in this context, not only labour supply does not create its own demand, but it also challenges the idea of labour market quantified and qualified only by pure mechanisms of supply and demand. Indeed, the cycle of social reproduction, farm production and the exogenous economic forces are driven by political factors which shape the wage dynamics and, through market regulations, the access to means of production.

However, this system reinforces also practices outside the market. For instance, at the end of the harvest of cotton I have observed women and kids going on fields to collect the branches of cotton plants to make fire, and picking seeds to make oil, or the left overs of cotton flowers to make *kurpacha*, the wedding's hope chest. This *things* were accessed for free, as sort of *public* goods. Thus, such form of 'commons' which contribute to provide means of subsistence shows that the process of expropriation from the means of (social) re-production is still incomplete and provide a buffer for the rural poor to access *use-values* outside the capitalist mode of production. Thus, in this sense, the non-monetised economy and non-economic factors, such as reciprocity, still play a role in rural livelihood.

6.2.2 Land

Land is a crucial asset for agricultural production. Land reforms are the result of political decisions but often driven by economic rationale (Bernstein, 2010). As we have observed in chapter 4, the Uzbek state authority has intervened in different ways, at different point in time and for different objectives to shape land access in order to balance the objectives of productivity, efficiency and employment. It is argued by Bernstein that land reforms 'from above' usually aim at establishing farmers' capability and expansionary boundaries to be able to 'hold' the market. As shown in table 6.4, all groups of farmers have some access to land but in different forms defined by state regulations.

Table 6.4 - Average farm size by type of farmer (in Ha)

Type of farm	How many hectares is your farm?			
	Mean	Median	Maximum	Minimum
Wheat F&V farm manager	31.50	18.25	120.00	1.22
farm wage worker	.21	.15	.80	.05
DEKHAN (tomarqa)	.27	.16	1.15	.08
cotton farm manager	59.63	51.25	273.00	22.00

Source: Author's survey data

The survey sample confirmed that *dekhans* and wage labour have access to much smaller land size in comparison to farm managers. Besides the obligations attached to such bigger land (see section 4.2), this obviously increases the opportunities for managers to produce more and also accumulate. Interestingly, cotton-wheat *farmers* have on average a much bigger amount of land in comparison to the wheat-fruits & vegetables *farmers*. However, land does not prove or always correlate to a higher level of capitalization. Nevertheless, as being argued by recent ethnographic work done in Uzbekistan outlined in section 4.2, land is a proxy which allows to understand power relations based on local networks, or in relation to labour and output capacity, among different groups of farmers. Last but not least, different access to land size creates different patterns of food access which will be explained in chapter 7 and 8. There are three main issues on *land* which would need to be discussed. The first is related to the debate around efficiency and size mentioned in section 6.2.1. The second is about property rights and land reforms. The third one relates to the ecological constraints that this area faces with regards to productivity and water. This last point is not going to be addressed and can be a topic for future research.

Factors productivity occupies a central position in the debate around efficiency and thus growth. To understand how the goal of land efficiency has been addressed in recent policies, it is important to remind that various reforms have affected the relationship between land size and labour (see section 3.3.1). However, as mentioned in chapter 4, the land reform occurred in 2008, by 'consolidating' more *farmers* together, displaced many farm manager and created a big surplus of labour (Cornia, 2014). Those farm managers became either employees of the newly-formed and bigger *farmers*, or moved out of agriculture (FAO, 2014). However, because they did not find easy alternatives in the rural job markets or in other non-agricultural activities, this reform created even higher under-employment in the rural

economy. Therefore, in 2015 another ‘optimizing’ reform took place but with the opposite goal. *Farmers* entitled to land larger than 80ha have been divided again to increase competitiveness and create new farm jobs. The government still decides how the land has to be deployed based on the quality of the soil and the skills of farm managers (Cornia, 2014). Although this research does not focus on productivity and develops the study based on a wider set of criteria to analyse relations of production, it is undeniable how land reforms have huge implications on land productivity with respect to labour and accumulation patterns. Table 6.5 shows a high correlation between hectares per farmers and labour, especially when looking as seasonal workers, which might confirm a low level of labour productivity, largely driven by the abundance of cheap labour.

Table 6.5 - Correlation between land size and labour

		Farm size (ha)	seasonal	permanent
Farm size (ha)	Pearson Correlation	1	.853**	.454**
	Sig. (2-tailed)		.000	.000
	N	120	120	120
seasonal	Pearson Correlation	.853**	1	.277**
	Sig. (2-tailed)	.000		.002
	N	120	120	120
permanent	Pearson Correlation	.454**	.277**	1
	Sig. (2-tailed)	.000	.002	
	N	120	120	120

** Correlation is significant at the 0.01 level (2-tailed).

Source: Author’s survey data

The inverse relationship between farm size and productivity in developing economies has been acknowledged as a fact by neoclassical and institutionalist authors (WB, 2013; Cornia, 1985; Lipton, 2009). Following this presumption, small-holders farmers have been the focus of WB’s policy recommendations because of scarcity of capital and abundance of labour (ibid). The rationale of this literature is based on static analysis in contexts with short-term changing technology (i.e. green revolution). However, such cross-sectional comparisons fail to incorporate complementary dynamic effects such as technological and organisational change in the long term. Although table 6.6 shows a negative correlation between land size and yields of cotton and wheat, it cannot support the rationale behind the causality of such inverse relationship. It is argued that broader multidimensional reasons such as the heterogeneity of ecological conditions related to fertility, agro-climate, water availability but also and foremost crop specificity and labour employment, let alone misreporting during data collection, could

intervene in explaining productivity outcomes (Poulton et al, 2008; Collier and Dearcon, 2013; Gourlay et al, 2017).

Table 6.6 - Correlations between cotton and wheat yields and land size

		yield_cotton	cotton ha
yield_cotton	Pearson Correlation	1	-.374*
	Sig. (2-tailed)		.042
	N	30	30
cotton ha	Pearson Correlation	-.374*	1
	Sig. (2-tailed)	.042	
	N	30	120

*. Correlation is significant at the 0.05 level (2-tailed).

		wheat ha	yield_wheat
wheat ha	Pearson Correlation	1	-.364**
	Sig. (2-tailed)		.005
	N	120	57
yield_wheat	Pearson Correlation	-.364**	1
	Sig. (2-tailed)	.005	
	N	57	57

** Correlation is significant at the 0.01 level (2-tailed).

Source: Author's survey data

Dynamics of land and production are indeed context-specific and crop specific (Dyer, 2004; Sender and Johnston, 2004; Johnston and Le Roux, 2007; Oya, 2008). If we look at crop specificity, cotton requires especially during the growing season preparation of the land, planting seeds, weeding, applying chemical etc. which make this crop labour-intensive (Larsen, 2006). Thus size benefits from scale economy but only for certain phase of the production process. Also inverse U-shaped relationship could be possible if dynamic processes are taken into account (Bramall, 2004) which confirms Dyer's concerns of aggregation bias (Johnston and Le roux, 2007). Therefore, the arrangement and requirements of *labour* is different for different crops such as F&V, and, last but not least, it does not consider the role of unpaid family labour. As underlined by Oya (2005), scale matters but as Bernstein noted (2010), size cannot be the only criteria of capitalisation of agrarian production, which is also linked to the entry cost of capital investments. This case study confirms this theory when looking at the relatively smaller land but relatively higher capitalised and labour-intensive production of F&V, orchards and vineyard as opposed to cotton. In sum, in this case it is clear how productivity cannot be explained by the land size exclusively, but rather by multidimensional factors. As Dyer observes, outcomes depend on the social context in which farmers operate thus methodological caution should be raised. Indeed, although it is recognised the role of self-reported yields and the fact that the survey

did not specifically focus on productivity, when looking at the correlation between land fees¹⁵ (which is calculated based on soil quality) and yields, data show a statistically significant correlation for cotton, which might suggest that the agro-ecological characteristics of soil matter in explaining productivity (table 6.7).

Table 6.7- Correlations between land tax and cotton and wheat yields

		yield_cotton	land tax
yield_cotton	Pearson Correlation	1	.387*
	Sig. (2-tailed)		.038
	N	30	29
land tax	Pearson Correlation	.387*	1
	Sig. (2-tailed)	.038	
	N	29	59

*. Correlation is significant at the 0.05 level (2-tailed).

		land tax	yield_wheat
land tax	Pearson Correlation	1	.316*
	Sig. (2-tailed)		.018
	N	59	58
yield_wheat	Pearson Correlation	.316*	1
	Sig. (2-tailed)	.018	
	N	58	57

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Author's survey data

With regards to the land property rights and use regimes, in section 4.2 it has been outlined that the land devoted to state crops is not a commodity and it is leased for up to 49 years. It has been noted, and discussed in chapter 5, that the reallocation of land through the recent land reforms has created instability in land use and halted profitability due to efficiency losses (e.g. Djanibekov et al. 2013). However, here it is argued that the current policy seems sound for multiple economic and non-economic reasons. First of all, as it has been observed in some LICs in SSA and South Asia analysing land redistribution, given the pattern of land market and the incentives for production, the transfer of private property rights (privatization) to farmers does not always translate in development as it decreases wage-employment opportunities and increases dispossession among the poorest (Khan, 2004; Sender and Johnston, 2004).

¹⁵ Each year a land tax '*bonitet-bal*' has to be paid by farmers manager based on the classification (which fee is based on the quality, thus productivity of the land) conducted every 5 years land and is decided by the land register through a classification from 0 to 100.

Table 6.8- Land tax by type of farmer

	land tax			
	Mean	Maximum	Minimum	Median
Wheat F&V farm manager	63	95	35	60
cotton farm manager	55	81	30	55

Source: Author's survey data

Table 6.8 shows that, on average, fruits and vegetables and wheat farmers have a higher quality of land, measured in *bonitet-bal*. Usually in Samarkand the average for cotton is 57-56 and 63 for HVCs, whereas dry land is 50 and thus pay a lower tax land which nevertheless implies also lower productivity. As reference, very fertile land reaches a level of over 80. It can be argued that such mechanism of progressive taxation, from one hand can be a disincentive to improve land productivity, on the other hand could incentivise dynamics of under-reporting in order to pay less tax (Djanibekov et al, 2012). Last but not least, the criteria under which farmers are able to access such lease contracts is on paper based on skills criteria such as education and know-how, but it is undeniably, as discussed in chapter 4, also linked to local social networks (e.g. Veldwish and Bock, 2011; Trevisani, 2008). Said that, this case study proves once again that land size cannot be treated as the exclusive explanatory indicator to identify different class positions (Zhang, 2015). Also, it does not explain productivity because productive forces are linked to social, organizational and political factors. Nonetheless, land regulation has served as buffer to dynamics of capital accumulation as well as distribution. It is argued that in Uzbekistan, although the mechanisms of land acquisition remain unequal and non-transparent, the non-commodification of land has avoided conditions of extreme inequality, land concentration and dispossession.

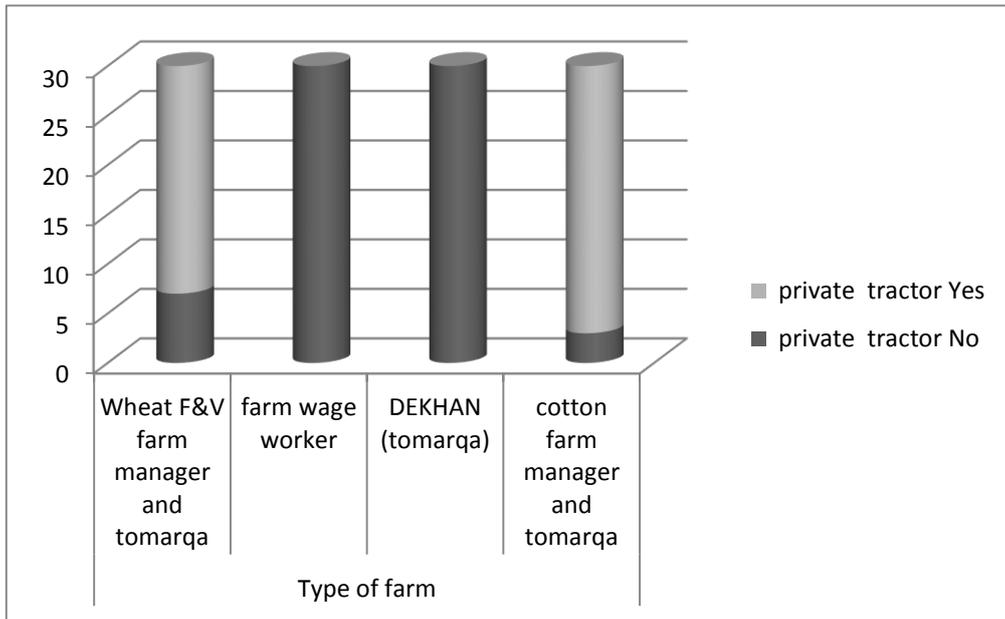
6.2.3 Physical inputs

The agricultural sector in Uzbekistan has been traditionally described by the literature as inefficient, because state interventions have distorted price signals, intervened through state subsidies and tariffs and thus diverted resources allocation (see section 4.2.2). These policies have generated low level of labour productivity and high costs generated by subsidies to fertilizers (Brooks et al., 1991). Based on survey results, in this section I will show that the reality is more complex, and new forms of market integration of the agrarian production

through the rise of commercial inputs are appearing. Here, I explore the access to selected physical means of production and outline the divergences between state-subsidised and market-based provision. I will pay particular attention at the dynamics of access behind the state-crops, namely cotton and wheat. The inputs required to transform cotton flowers into spanned cotton are: cotton seeds, pesticides (insecticides, fungicides, and herbicides) and fertilizers.

Machine-Tractor-Parks (MTPs): MTPs are places where *farmers* can rent sowing machines tractors and ploughs, publicly procured at the district level, by paying a small fee. Those parks have been reorganised from direct state management to join-stock companies since 1997 and their objective is to strengthen the technological capacities of agrarian production. Based on interviews conducted with a tractor park administrator in the Isthikan district, a farm manager pays on average 20,000 sums (4USD\$) per hectare to rent a tractor. The MTPs I visited during the fieldwork in Samarkand had more than 50 tractors, and 50 ploughs, which, according to the comments gathered during the visit to the tractor parks, do not satisfy the demand of the local farmers. However, they also provide repair services and supply spare parts of machineries thus supporting the technical basis of local production. Authors have denounced the fact that few public resources are invested in such provision and this has created political conflicts between local operators and local administrators due to abuse of powers (Shtaltovna, 2013). Studies in Khorezm region confirmed that machines are less than those necessary and obsolete (Shtaltovna et. al., 2014). In this perspective, it has been argued that the lack of market competition create disincentives for technological innovation and therefore productivity enhancement. Nevertheless, as shown in figure 6.1, most farm managers usually own one or more tractors showing that they are able to invest their own private capital rather than relying on the parks. The import of agricultural machineries doubled from 2005 to 2009 passing from 1100 units to 2500 (faostat).

Figure 6.1- Private tractors



Source: Author's survey data

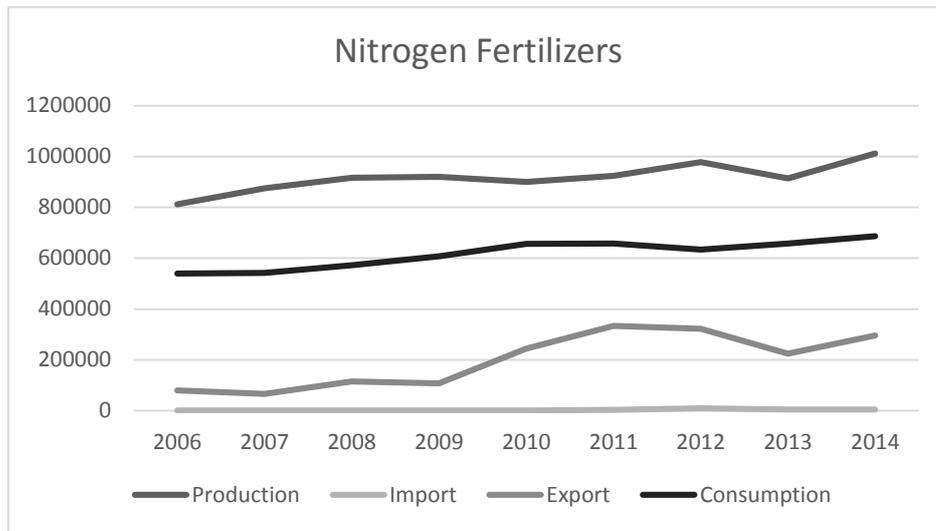
This suggests that there is a private market for machineries which creates some competition with such services as result of the ongoing farm differentiation and market penetration. It is also observed that new forms of private services repair and private tractors are bought because new markets are created by the demand of wealthier *farmers*. The risks of exclusion as result of liberalised markets should be therefore included in such analysis. The existence of these MTPs, even if out-dated, contribute to provide machineries and services to those who cannot afford private services.

Seeds for wheat and cotton are developed by the state agency for agro genetic research and provided to *farmers*. In Tashkent there is even a particular agency for cotton named The Uzbek Scientific Research Institute of Cotton Breeding and Seed Production, which works to improve the high-yielding variety and disease resistant and is protected by the Law 252 which aims at the conservation and use of genetic resources. Regulations are in place to manage the state register of crops released in Uzbekistan, as well as to regulate mechanisms on quality control, which are in a small share outsourced to foreign companies but where state companies still own the majority (ICARDA, 2006). State provision of seeds contributes to stabilise prices and guarantee the homogenous distribution of those seeds. For farm managers engaged in F&V production, the scenario is different, because they are inserted in commercial mechanisms. Although this has not been the focus of this PhD, it is an interesting aspect to explore in future research. Indeed, the state provides support in different forms. *Okhalik Oltin Boghi Mevasi*, is an example of public-private consortium of 680 ha, created as

result of the sector's reform to boost HVC production. As part of public investment in intensive gardening, large cultivation of plums, apples, and peaches have been introduced, through public investments, managed by farmers. This big consortium of farmers acquire through state-supported credits new high-yields seedlings (small trees) from Ukraine, Serbia, Poland and Greece, and other European countries. Such capital investment are subject to increasing marginal returns in the long-term. Indeed, in the first year of harvest the returns to investment are low as the trees produce only 4 ton of fruits, but it will increase in the second year with 8 tons, in the third year with 15 tons, fourth year 20-25 tons and so on. The expansion of the local private profit is here triggered by public investments. Such large state investments have indeed supported the expansion of new value chains through the introduction of new seeds and plant varieties. Dekhans do not have access to such services. Therefore from here it is possible to identify which sector has been identified by the government as 'champion'. In a context of private capital scarcity, such types of innovation can only be possible through the political commitment of the state in prioritising long-term investment objectives instead of focussing on short-term market gain (Mazzucato and Perez, 2014). This aspect will be further explored in chapter 9.

Fertilizers are key to improve the performances of agriculture. Their provision depend either on import or on the investment on the domestic chemical industry. The GoU controls through various joint-ventures with foreign companies (i.e. Maxam-Chirchiq, Japanese Mitsubishi Corporation and Chinese CITIC) 12 production plants and 13 regional distributions companies, a brokerage company and a research institute employing 48,000 people. From figure 6.2, it is observable a steady growth in production, export and consumption of nitrogen "N", and similar trends are for, "P"—phosphorus, "K"—potassium, and ammonium nitrate, where consumption increased twofolds in the past years. This evidence, as I will explore further in chapter 9, seem to challenge the argument raised by Brooks et al. (2001) about the negative effects of input subsidies on the agro-industrial production complex.

Figure 6.2- Production, import and consumption of fertilisers



Source: FAOSTAT

Based on interviews with two employers of the regional distribution of State joint stock-company 'Uzkimiosanat samarkandkymio' in Samarkand on 24-25/11/2015, the local public administration provides preferential channels for the stipulation of contracts with such companies. Usually, farm managers, both for cotton and for wheat, are entitled to stipulate annual contracts for fertilisers with the Uzkimyosanoat at a subsidised price: Nitrogen (N) at 1100 sum/Kg, Phosphorus at 500-700 sum/Kg plus an administration fee of 900sums/Kg. The average rate of application of fertilizers is 200 kg per hectare. *Farmers* receive this package twice per year depending on the land quality and on the size of the farm. Cotton, being exposed to pest attacks and diseases, needs in addition crop-protection chemicals. Those do not improve yields directly but do avoid losses so are extremely important in cotton cultivations (Larsen, 2006).

Such state-supported system of inputs procurement has avoided the scenario occurred in many liberalized settings where commercial farmers simply lost any economic or physical access to such crucial inputs (Oya, 2007). Many countries in SSA have been forced by the IMF and the WB to remove subsidies and facilitate the privatisation of agrarian inputs which led to an increase in prices, import dependency and ultimately decline of their use (ibid). By contrast it is argued that subsidising fertilisers can reduce the risks of decline of productive capabilities and is an effective way to ensure stability of provision and good quality standards (Chang, 2009; Kay, 2002). Nevertheless, during the survey, *farmers* cultivating F&V declared to buy foreign brands such as Dupont and Syngenta. This shows how farmers' stratification is present, and visible through different aspects.

Dekhans are not allowed to buy fertilizers and chemicals from this state companies, and when asked the reason why, the employees of the public company producing fertilizer replied that it is because of the lack of skills and security. *Dekhans* rely instead on organic inputs (e.g. *Amosof* and *carbonite*) which costs between 750 and 1100soums/ Kg (150 kg per ha) and Kali: 850 soums/Kg. It is possible to buy these products at the bazar but only in the appropriate season. In fact in my research sites any chemicals were found in the farm shop (*vet-dorixona*) in autumn. Nonetheless, the biggest majority of *dekhans* rely on livestock manure which is used as alternative to nitrogen, but arguably less effective because of the volatilization.

Water is a very controversial issue in the country because is scarce and irrigation system have raised many criticisms in the literature due to poor conditions of the infrastructure. This discussion falls beyond the scope of this research. However, it is important to know that water resources are property of the state and, according to the legislation, the government guarantees its effective utilization in the interests of the people. Water Use Associations¹⁶ are non-governmental associations which manage water resources at the local level. There is a subsidised fee for water provided to state crop farms whereas private businesses and household have other fees which are stipulated by the articles 257–264 of the Tax Code which is paid on the amount of water consumed. Newly established horticulture agro-firms adopted also drip irrigation (propylene tubes), which is an expensive water-saving technology, also financed through state assistance.

Credit, in a neo-classical perspective, should be based on market mechanisms because it would supply credits at rates that reflects market costs and risks (Byres, 2003). It is also assumed that market-based credit would be supplied everywhere there is a demand. However, based on empirical evidences, credit market is rarified in rural areas because of the low level of capitalisation and the high risks connected to the uncertainties embedded in the agrarian production. In Uzbekistan, farm managers have access to preferential credit channels through the Agro banks with 3% interest rate, well below market levels which is at around 10% and do not even reach inflation's rate (between 5% and 7%, according to the *State Committee of the Republic of Uzbekistan*). This governmental policy is put in place to finance desirable investments which would not obtain commercial banks' support. Moreover, new HVCs, such as vineyard and gardens are exempted from tax for two and three years respectively creating incentives and concessions to the particular segment of production (FAO, 2015). In the survey we have assessed that only farm managers (*farmers*) have bank

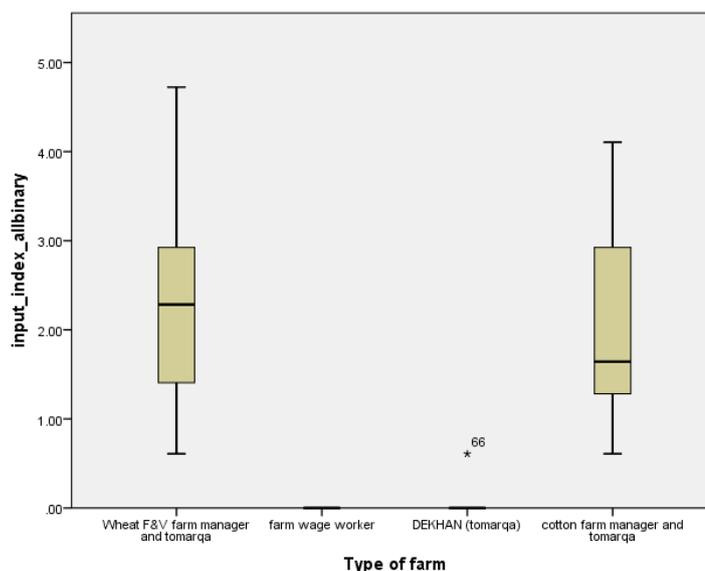
¹⁶ <https://www.loc.gov/law/help/water-law/central-asian-states.php>

accounts, necessary condition to access the ‘formal’ credit market. These figures on financial exclusion reflect one of the axes of income inequality between *farmers* and *dekhans*.

INPUT INDEX

As discussed in chapter 4, after the collapse of the Soviet Union, with the disappearance of *kolkhoz* and *shirkats*, the state has withdrawn from the role of direct manager of labour and as farm manager which has given nature to new forms of power and changing interests (Trevisani, 2008). The differentiation in the use and access of the inputs outlined above partially explains the patterns of class stratification. Yet, it proves a sporadic yet increasing penetration of private capital. For the creation of the index which could measure different levels of access of inputs, I have used a Principal Component Analysis (see details in Appendix VIII). In the survey I have asked to the groups of farmers whether they had access to state subsidised tractors, seeds, fertilizers, water, credit, and extension service, and whether they hired permanent labour (all binary). I included only permanent labour because it would explain better than the casual labour (often identified in the cotton pickers), the processes of class stratification and accumulation through the market. Indeed, hiring permanent labour in this case study has been considered a crucial indicator of the expansion of farm’s production capacity. I included instead private tractors and other market assets in the asset index because I wanted to isolate the state-supported inputs. The index, based on those variables, explained the differentiation on the access to inputs/means of production and permanent labour combined.

Figure 6.3 - PCA input index



Source: Author’s survey data

Figure 6.3 confirms a very sharp differentiation between *farmers* manager and *dekhans* with regards to the access to inputs and labour. The loading in appendix VIII confirms that F&V-wheat *farmers* rely on higher access to inputs overall, especially for seeds and fertilizers. Therefore, such agrarian stratification is occurring also through different support to physical inputs, and increasing demand for wage labour. Said that, it has to be noted that *farmers* managers face some barriers to the process of capital accumulation. First, because land is not a commodity (non-tradable), so the possibility of economy of scale through land concentration are very limited. Second, because the public provision of inputs (guaranteed at a fixed price) partially relieves farmers from the competition-driven pressure of minimising production costs. Third, as I will discuss in the next section, because the system of public procurement of wheat and cotton guarantees a taxed (low) but fixed price, thus it bypasses the objective of profit maximization. In sum, competition is a necessary condition for capitalist relations of production to improve productivity. In the context of agrarian Uzbekistan, the market rules are partially 'suspended' because the state provides and buys, at least for the state crops (wheat and cotton) the means and the product of productive labour. Nevertheless, the fact that there are disciplinary mechanisms such as fines put in place, put farmers in the condition of fulfilling output targets. The rents or losses produced in this system would be discounted or absorbed by the government. Furthermore there is still some degree of competitive force in place which will be explored now further.

It can be thus argued that farm managers could fall between the categories of rich peasants and semi-capitalist farmers because they are not dependent on selling their labour-power, since they have been entitled to access adequately the means of production (they are not dispossessed), nonetheless the institutional barriers regulated by the state have decoupled them from some of the market/profit-based fundamentals of capital accumulation. In Uzbekistan indeed, the so called 'primitive accumulation' did not occur yet. Thus farm managers, can be considered themselves object of a further level of exploitation by the capitalistic state. This makes us reflect about similar forms of agrarian transition discussed in the literature (i.e. Byres, 2003; Kay 2002; Chang, 2009). Likewise, here the state seems to socialise the risk of agrarian marketisation and deliberately distorts the market to accumulate as much surplus as possible, a pattern which will be discussed in chapter 9. Nevertheless, preferential access to the means of production through the state-crop and new forms of investments for HVC remain an important factor to understand the differentiation/accumulation process. Moreover, *farmers* are the main source of employment for the most vulnerable *dekhans*. Therefore, the state exercises its power over

wages and tighter social relations to increase their rent (or surplus value) by perpetuating forms of informal labour.

6.3 Market channels: a commercialisation index

As reminded at the beginning of the chapter and explored in section 2.3, agrarian transformation is related to patterns of commercialisation of agricultural outputs. As mentioned there, farmers are subject to different commercial forces for different crops which are highly context-specific. Therefore, it would be problematic applying standard commercialisation measurements universally. For example, the effects of quotas and prices mechanisms shape their relationships with the exchange channels, therefore the risk is to fall into biased and approximate results and conclusions. Farmers' outputs, has observed in chapter 2, are usually the first to be commercialized, as opposed to the inputs (Bharadwaj, 1985). Commercialisation has been defined in many ways, but in general terms it means that the good passes, or at least partially, through market circuit for sale as opposed to exclusive and final use. Such transition permits the increasing integration of the mediation of money as a mean of exchange triggering mechanisms of accumulation where profit and investments act as driving forces. In this case-study I identified through inductive approach six destinations where farmers' outputs end up:

- 1) **Own consumption** = direct subsistence (no money involved)
- 2) **State procurement** = production sold to the state at fixed price
- 3) **Local Bazar** = engagement with local market
- 4) **Wholesales** = engagement with more structured retails
- 5) **Processing companies** = engagement with great distribution
- 6) **Export** = engagement with international market

This classification reflects different distribution channels of the crops-commodities, which correspond to an increasing monetisation, formalisation and sophistication towards market-based dynamics. It is important to note that for the quantitative analysis, wholesale and export are put together because, even if the sale prices are not equal (export generally faces the highest return among all the possible market channels), they are the highest among the other alternatives. Moreover are defined as those channels for which buyers are not the ultimate users and foresees the involvements of middle man or traders. There is also a point to be made about subsistence (here 'own consumption') and its relationship with the output

index. Having food commodities value both in their exchange and in their use, consuming the output has an opportunity cost with respect to the exchange return from the sale. This is the baseline form of a commodity. Also, this exercise is an important opportunity to reflect on the need to contextualize the methodology.

Table 6.9 - Market channels

%	Own Consumption only	own consumption + Public procurement	own consumption+ bazar	own consumption+ processing company	own consumption and wholesale and/or export
wheat +f&v farm manager	0	96.7	93.3	86.7	26.7
farm wage worker	20	0.0	76.7	3.3	0.0
Dekhans (tomarquas)	10	0.0	90.0	0.0	0.0
Cotton+ wheat farm manager	0	100.0	63.3	0.0	0.0

Source: Author's survey data

Although this case confirms that in non-capitalistic settings market is thin and less formal transactions are in place, survey data proved that family farming (*dekhans*) are nevertheless engaged in commodity exchange, providing a vivid and active role in rural, both formal and informal, market exchange (Bernstein, 2010; Oya, 2005). From my fieldwork (see graph 6.9 which describes non-mutually exclusive options of output destinations by groups of farmers), 90% of *dekhans* were inserted in mechanisms of commercialisation at small-scale. In particular, from the interviews, all respondents sell to the local bazar at least one crop, typically either potato, apples or tomatoes. *Dekhans* that have access to more than a 0.3 ha generally sell a more diversified supply to the market including greens, cucumbers, grapes, carrot etc. Another interesting insight is that farm wage workers are less involved in crop commercialisation in comparison to *dekhans* (differences between farm wage workers and *dekhans* are explained in chapter 5.5). This is because often farm wage workers access land in exchange of their labour power, when involved in sharecropping (usually between 0.1 -0.5 ha). Moreover, selling to the bazar is a job that requires time. Sometimes it is redistributed within the household, namely to wife or sons, but in some cases labour is hired, so

competition effects on time play a role in the commercialisation outcomes. Those examples show that small-holders farmers do not operate exclusively in regime of subsistence as sometime assumed in the literature (see chapter 2). Instead, they are inserted in marketised forms of agricultural production and exchange by occupying a disadvantaged position in relation to farm manager because of the small size of their land. Indeed, a striking observation is that wheat-cotton *farmers* rely less than *dekhans* on market channels for the sale of their outputs, although they have access to the *tomarqua to produce crops* (household plot). Among the respondents, a small proportion of *farmers* sell to the bazar. This is arguably because the 'safe and steady' state procurement channel might offer a disincentive to engage with potentially unstable markets.

Instead, *farmers* involved in the production of F&V hold the most diversified commercialisation spectrum for output, engage with the most sophisticated market channels thus are the most market-oriented for outputs. Because of their wider capital access and state support through credit, those categories of farmers are involved in new imported varieties of fruits or even wheat, which, as mentioned in section 6.2.3, have higher quality, higher yields, and more expansive seeds. Those types of farmers, according to interviews, own also big cold storages capacity, sometimes even refrigerators, which allow to modularise their sale in the local markets and catch the highest return in different seasons, which are sometimes even three times higher. Instead, those who do not have a storage are obliged to sell their outputs to processing companies at a lower price. To stipulate this contract with processing companies, the local administration (*hokimiat*) is involved to coordinate the negotiations between the farmers and the buyers to set prices and quantity of the contract. According to one respondent interviewed, *farmers* prefer to sell to processing companies even if the contracts are not very profitable. Firstly, because the crops can be of lower quality and secondly, because the local market bazars, although on average offers higher prices, is saturated in abundant seasons. Our observations confirm that farmers sell their products to processing company to a lower price as compared to bazar, sometimes even three times lower. This case proves how prices are heterogeneous and extremely divergent even in the local economy.

Nevertheless, to access those contracts with processing companies, wholesale or even the more profitable export, farmers needs to be able to produce large quantities of products, and be able to move it physically in a timely manner. That means using trucks or with the help of middle men. This is generally confirmed also in other case study (e.g. Le Roux et al., 2009

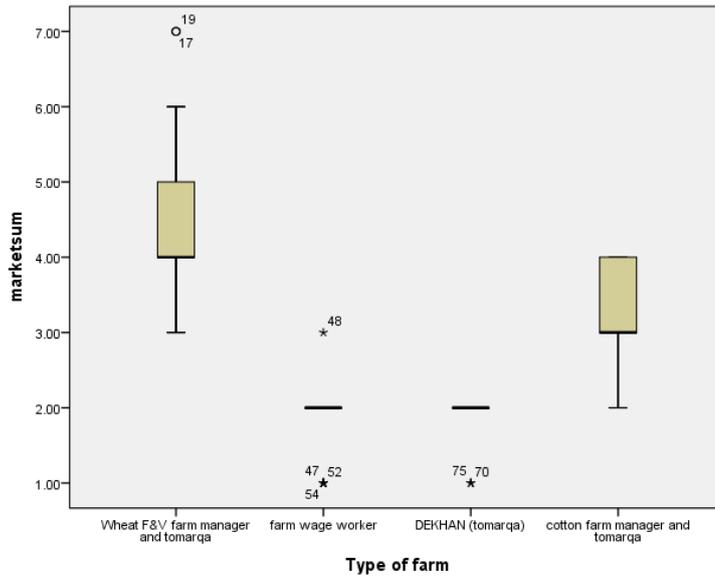
in USA), especially in case of perishable crops, which confirms their time-sensitive nature and decreasing marginal value. However, once the contract is stipulated at the beginning of the season, the products are sold. That means that the farmers, if given the possibility of this option, prefer to sell larger volume in one shot to a lower price rather than through smaller transactions and risk to remain with leftovers of unsold products. Indeed, based on unstructured interviews, it is noted that the risks of price seasonality getting very low in peak season, is a reason of losses for many farmers involved in the production of F&V. The commercialisation of agricultural outputs in many contexts has brought indebtedness (Kaplinsky, 2004) as result of price volatility and a rise in the cost of inputs, which can be an easy driver of debt for farmers. Disruptions in the supply chain due to lack of infrastructure summed to the issues of prices volatility. Therefore, F&V are more profitable but also involves higher risks linked to weather, pests, and market demand, which are totally borne by the farmers. I will discuss in chapter 9 that after there has been price peaks and supply shortage in the markets, the government in April 2016 (after my fieldwork) has introduced new measures to regulate the market flows (which were then lifted in September 2017).

In conclusion, multidimensional factors such as sale regulations, production volumes, risks (biological and market based) labour demand and supply and specific cost linked to the distribution, and physical and social infrastructures contribute to define the 'commercialisation' process. Coercive forms of public procurement where the GoU holds monopsony power for state crops coexist with unregulated market drivers of commercialisation that affect both state-managed land and *dekhans* households involved in HVCs. Such binary setting does not mean forcibly that the latter is better than the other one. Both have costs and benefits for specific groups. In fact, public procurement and monopsony power, which are judged by many as undesirable, in reality are accompanied by support mechanisms and provide safety nets at the input level and output level by guaranteeing a minimum price. In this sense this case study confirms that a greater market orientation could correspond to higher prices but also market risks.

The component PCA score box plot in figure 6.4 depicts the different commercialisation levels among farmers. The interesting part is that for F&V farmers the vertical line shows high levels of variability for both higher and lower quartiles in their degree of commercialisation, whereas for cotton the variability is only for lower degrees. Moreover, the stars show the outliers. In the PCA (see appendix IX), it comes with no surprise that processing companies, wholesale and export have the strongest loading among the different market channels. Not

least, public procurement is also strongly correlated because it represents the *conditio sine qua non* to have access to a larger amount of land and subsidised inputs for cotton and wheat. It is argued then that state crops, although seem to be restricted by the state control, paradoxically provide better conditions for farmers to commercialize other crops in the market. As prove of that, bazar is negatively correlated because indeed, is the less profitable options in which only small peasants (*dekhans*) are obliged to engage with.

Figure 6.4 - Output index



Source: Author's survey data

Interesting considerations could be drawn based on the survey question that asked to farmers if they would like to grow something else. This question was posed to test the argument outlined in the literature and in chapter 4 that associates market to freedom, and it sees market-reforms as an opportunity as opposed to the current coercive state procurement system. Surprisingly, only 58% of the farmers answered yes to the question if they would like to produce other crops instead of cotton (Q.22), listing mainly commercial/high value crops, namely tomato, potato, corn, carrot and onion as options, mostly to sell (Q.23 asked if the new crops would be produced for sale or for consumption). They explained through an open question that the high productivity of those crops would give them higher returns.

Table 6.10- Q24: Why don't produce other crops?

state contract	15.7
irrigation problem	10.0
no enough land	35.7
soil condition	28.6
Agrotech capacity	10.0
Total	100.0

Source: Author's survey data

While there might be under-reporting linked to political concerns nevertheless, as shown in table 6.10, answering '*why you do not produce other crops?*', only 15.7% identified the state contract as a constraint. Interestingly, in the 35.7% land size was identified as the main problem, but even if this response untangles a suffered power relations/structure between the state and farmers about land access, the answer suggests that state crops would not be substituted by new crops. In some other cases, scarce agro-technological capacity (10%) (e.g. greenhouses), or soil condition related to irrigation (28%) were identified as problems.

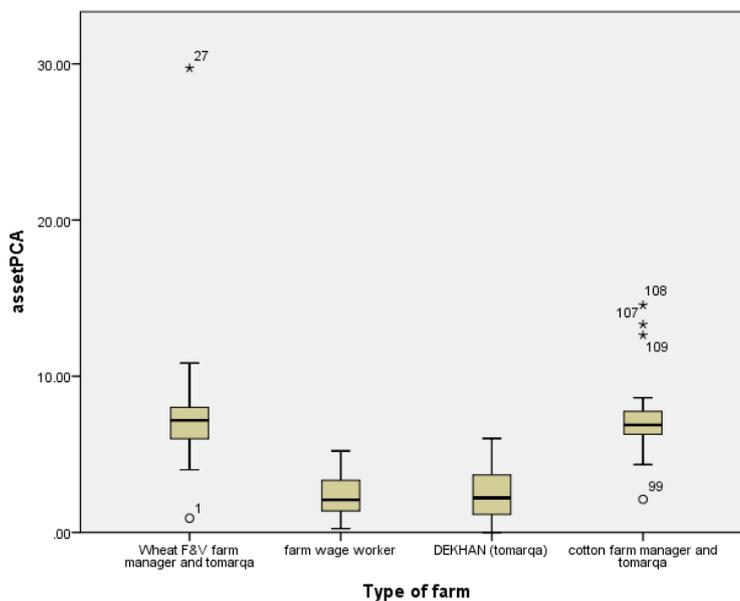
Those results confirm a very heterogeneous spectrum of challenges not exclusively linked to the state procurement system. Yet, they highlight the need for additional investments in physical infrastructure and technical capacity. Although these questions did not intervene directly in answering the core research questions, they have been valid contributions to re-contextualise the debates and re-discuss the directions that the agrarian sector should take to implement market transition while avoiding exclusion and ultimately food insecurity. In fact, the literature has largely debated on the impact of commercialisation on the peasantry and those data invite to reflect on two things: first, commercialisation comes with uncertainty intrinsic of market risks and volatility. Second, the state could intervene to shape and moderate such instability, by also provide capital investments in a context of low private accumulation. Regardless, class differentiation and therefore inequality of economic power is an intrinsic implication of such process, which can be detrimental for agrarian growth and food consumption.

6.4 Patterns of asset accumulation

As explained in chapter 5, ownership of assets has been used as a 'proxy' of economic status to assess different levels of wealth among the farmers interviewed during the survey. Such

choice is based on the context, which is characterised by non-market and market transactions where barter and informal exchange play a key role. I explain in the appendix VII the construction of the asset index and I will use this measure in later chapters 7 and 8. The asset index confirms the results observed both in the inputs and output indices. Private (non-state subsidised) inputs are starting to play a role within the higher strata of farm managers which confirms the hypothesis that through state managed preferential channels, farm managers are able to accumulate more.

Figure 6.5-Asset index



Source: Author's survey data

The box plot in figure 6.5 shows lower access to assets for farm workers and *dekhans*, with F&V-wheat and cotton-wheat *farmers* having the highest variance across their sample population. Fridge, bank account, tractor and car had the highest loading. Last but not least, I have also collected information of animal possession. Animal traction is an important asset for farming because it allows farmers to increase yields as they can be also employed in the land as draught power, provide manure and be used as a collateral (Leavy and Poulton, 2007). In the survey, I found a positive correlation (0.277) between land tenure and cows (0.270 for sheep) livestock reflecting the fact that large volume of livestock requires land (and water) and possibly, that owning livestock correlate with more 'endowed' farmers, as shown in table 6.11, where state farm manager own on average more animals. Generally, women take care of the livestock at the farm level. However, there is an increasing investment in 'industrialised'

production of livestock, chicken and dairy processing sector as result of increased demand which is not explored here but could be a topic for future research.

Table 6.11- Animal Asset

	cows	bulls	horse	donkeys	sheep	goat	chicken	turkey
Wheat F&V farm manager	7	2	1		6	2	13	1
farm wage worker	2	1			1		5	0
DEKHAN (tomarqua)	2	1			1	0	5	0
cotton farm manager	5	4	1		8	2	26	2

Source: Author's survey data

Finally, I cross-check the three indices in figure 6.12 which shows that all have a positive significant correlations. In sum, assets ownership, as demonstrated by empirical evidence is likely to be a determinant of commercialisation and vice-versa.

Table 6.12- Correlations input, output and asset indices

		Input index	Output index	Asset index
inputPCA	Pearson Correlation	1	.476**	.490**
	Sig. (2-tailed)		.000	.000
	N	120	120	120
outputPCA	Pearson Correlation	.476**	1	.652**
	Sig. (2-tailed)	.000		.000
	N	120	120	120
assetPCA	Pearson Correlation	.490**	.652**	1
	Sig. (2-tailed)	.000	.000	
	N	120	120	120

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Author's survey data

6.5 Concluding remarks

This chapter looked at the technical mechanisms of agro-food production and tried to explain the diverging patterns of commodification in relation to access to inputs and labour, outputs and assets. Through the construction of multidimensional indices, I argued that farmers, through crops, are subject to different speed and modalities of commodification and commercialisation for both inputs and outputs which affect their ability to accumulate and invest.

First of all, *state crops* (cotton and wheat) being a vehicle to access more land and subsidised inputs, create the basis for the agrarian class differentiation through dynamics of labour relations and asset accumulations. F&V-wheat *farmers* are at the forefront of the 'marketisation' process being the protagonist of more sophisticated forms of horizontal output commodification. This is visible through the higher productive capital and asset endowments and permanent wage labour they are able to hire. In particular, F&V *farmers*, although attached to the production of wheat, are the protagonist of the wider accumulation of inputs, outputs and assets. Benchmark farmers are identified for having additional land where to invest in irrigation pumping, more storage facilities. They invest their own private capital in machineries, storage capacity, and sometimes create small food-processing companies. They diversify their commercialisation channels and perform an increased volume of market transaction through money (monetization).

By contrast, *dekhans*, (as petty commodity producers) rely more on the local markets for selling their surplus of food crops than bigger cotton *farmers*. This commercial system, joined out of necessity to meet basic needs for social reproduction, makes them more exposed to systemic market vulnerabilities for production and commercialisation. Among the poorest strata it is observable a lower level of differentiation, as described in the Indian case by Nadkarni (1991) in chapter 2. They very often and when provided the opportunity, sell their labour power and use family labour to meet their basic needs. The relations between subsistence and commercial production strives through multilayer tensions for instance on time between waged and intra-household labor, for the access to means of production and market outputs.

By answering the agrarian political economy questions of *who farms, in which conditions and for whom (and why)*, I have empirically challenged the neo-classical assumption that looks at peasants as a homogenous analytical category ignoring the class stratification and

antagonism within them (Bernstein, 2010; Byres, 2003). I also highlighted that, although farmers respond to market incentives, their initial 'asymmetric' access to information and means of production plays a key role in their potential contribution to the labour and output market. Considering the distinction elaborated by Byres (2003) between capitalist farmers and rich peasants, here the destinations of the surplus of crops (see output index) seems to be the crucial determinants to define differentiations of classes of farmers. Here we observe how *farmers* managers, on the one hand are stuck in their position given by the impossibility of scaling up or capitalise their 'profit' by reinvesting in the same production line. On the other hand, many of them seem to manage to divert such 'rent' into other horizontal or vertical commercial activities which provide a source of accumulation. Furthermore they use mechanised inputs, they engage in wage labour relations, and have some control over their surplus. Indeed, *farmers* engaged in F&V register the higher speed of accumulation. In addition, none of the farm manager surveyed produce for subsistence only. Therefore, such stratification should be understood within a combination of 'pull and push' factors for investments: first, the patterns of inheritance and appropriation to state-crop land; second, the access to subsidised inputs; third, the rise of agro-processing businesses and increasing market demand for horticulture products.

This case study confirms that labour and social relations of production are highly heterogeneous and context specific (e.g. household economy combined to state-managed capitalism). Moreover, the binary settings outlined proves that although sharply distinct in their patterns of accumulation and production, farm managers and small holders are symbiotic and interlinked and depend on each other via market and non-market relations. Those processes are certainly not only due to the different accumulation patterns but are also intrinsic to social relations built at the edge between formality and informality where trust, information, networks, status and experiences count. As prove of such fluid mode of production, I show that cotton is subject to the state-led effort of commodification to exploit its nature of cash-crops. Cotton produces both positive and negative 'externalities' for the community which access its use-value beyond its economic role as commodity. Such informal welfare and cultural norms are embedded in the agrarian social relations of production.

The agrarian class differentiation process is confirmed to be occurring as an outcome of the slow penetration of capitalism in agriculture, exemplified by the increasing commercialisation occurring through the HVCs. In Uzbek agriculture as well as in other post- Soviet economies, the state is a strong economic actor and regulator, overlapping with the market forces

sometimes as market facilitator sometimes limiting private activities. In other words, the state is an agent within capitalism which has the advantage to exercise a political pressure over potential competitors, either if they would be FDIs or powerful local farmers. The point is not to quantify how much those mechanisms count in comparison to other contexts, but rather if those are effective in triggering virtuous incremental changes and able to minimize state rent-seeking in the long-run.

Patterns of accumulation originated by the creation of 'market' surplus value from below (Zhang, 2015; Bernstein, 2010; Byres, 1996) are very limited. Nevertheless, this result proves the peculiarity of the process of commercialisation in Uzbekistan which is filtered and restricted by political and economic goals set up by the GoU. This could be interpretable as a similar form of the Chinese 'capitalisation without proletarianisation' (Huang et. al, 2012). However, at a deeper analysis, dekhans barely satisfy their need for subsistence. In chapter 9 we will discuss why this case-study could represent a case of (primitive socialist) accumulation from above.

In conclusion, this exercise has served as analytical platform for the understanding of the productive and class structure in agriculture. In chapter 7 I will analyse how such production settings and class differentiations shape the food system of provision and thus the different patterns of food availability and consumption within the four categories of farmers identified, namely cotton manager, F&V manager, dekhans and farm wage workers.

Chapter 7: Patterns of Food Provision and Diet Diversifications

7.1 Introduction

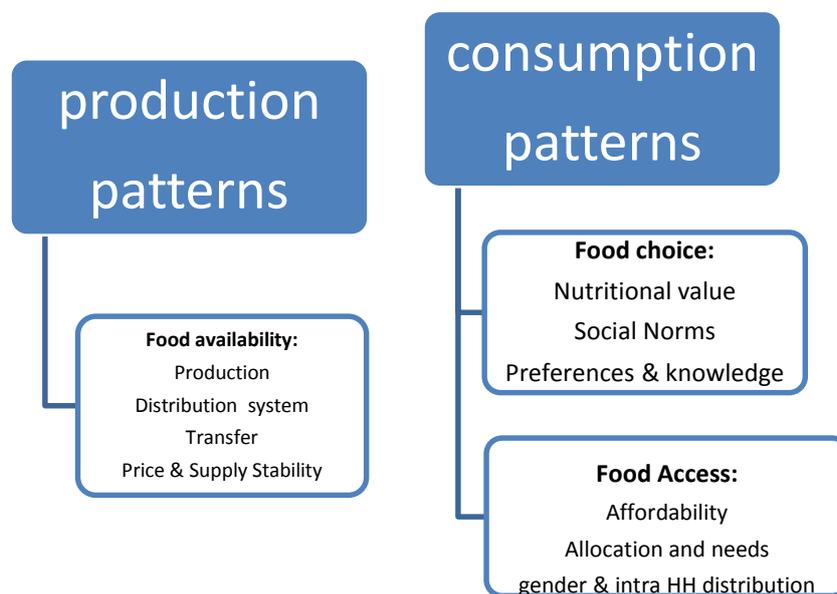
In chapter 6 I have identified the variables and discussed the mechanisms of class differentiation through the social relations of production and exchange of the Uzbek agro-food system. I argued that the specific policies applied to cotton, HVCs (F&V), and winter wheat producers affect differently their respective production and commercialisation patterns. Arguably, such class stratification gives origin to different composition and levels of food supply and demand. Indeed, it has been underlined within the food regime framework that different classes eat different quantity and quality of food which reproduces and explains the socio-economic implication of diet (Friedmann and McMichael, 1989; Fine, 1994). As argued in chapter 3, a diet allows understanding patterns of food consumption and their linkages with the food production and commercialisation at different scales.

I have also outlined in chapter 3 that the empirical evidences provided in other case-studies are too contradictory to conclude whether market transitions and commercialisation would be positively or negatively associated with a hypothetical more diversified diet (Collier and Dercon, 2013). I argued that answer are context specific and depends on the institutional arrangements provided. For instance, governments can coordinate between commercialisation, food security and health objectives. Therefore, starting from the observed agrarian production structure, this research attempts to provide a systematic analysis of the market and non-market drivers of food consumption in agrarian Uzbekistan. In other words, this case study questions whether different classes (i.e. managers involved in the cultivation of cotton and wheat, wheat and F&V, workers and peasant households-dekhans) correspond to specific diets and which are the differentiating mechanisms involved. I want to assess whether different classes of farmers bear positive or negative nutritional outcomes as result of their access to means of production and markets and the potential inter-dependencies between food-crops and cash-crops.

As already outlined, closed questions have been complemented with open questions and qualitative observations to grasp how the respondents' food consumption outcomes are linked to the specific social and cultural values of the context of reference. Queries related to non-market access to food have been asked in order to understand the dimensions of affordability, resource allocation, knowledge and preferences. We refer to the strata assessed in chapter 5. The hypothesis that will be tested is whether more commercialized – in the Uzbek sense- farmers, and particularly state crop farm managers hold a better position

(as opposed to *dekhans* and farm wage workers) with regards to food access, availability and dietary diversity and whether this is due to the fact that those are more integrated with the market. Therefore, this section observes if and how such crop diversification process is influencing food consumption at a small-scale level. To assess this, I refer to the indicators on consumption patterns outlined in Figure 7.1 which encompasses individual, economic, and social factors. The chapter is structured as follows: section 7.2 discusses food choice, knowledge, and preference around food. Section 7.3 looks at how different farmers differ in food security and dietary diversity. 7.4 looks at affordability, 7.5 at gender and 7.6 concludes.

Figure 7.1 -Food system in Uzbekistan: interaction between production and consumption



Source: Author

7.2 Food choice, values, and knowledge around food

Before starting to analyse the data on food use and access, drawing from the review of the literature on food consumption in chapter 3, some considerations need to be raised in relation to the epistemological, theoretical, and ontological presumptions of this section which explores human eating norms in a specific context and point in time.

Many sociologists and social scientists studied the implication of ‘entering’ the market for food consumption as we saw in chapter 3. Economic growth has been often associated with a diet transition from plant-based food to animal-based food as well as with an increasing convergence to western models of nutrition (Popkin, 2003; Hawkes, 2006; Dixon, 2009). In this picture, induced consumer preferences lead to higher consumption of fat and sugar, reduction of cereals and inadequate consumption of F&V (Hawkes, 2006). Therefore, in a

context of commercialised food consumption, what is consumed depends on the availability and 'offered supply' on the market, which, although not exclusively, is influenced by the market itself. It is in fact recognised that what is available on the market very often it is not the result of social and nutritional values demanded by consumers. Trade openness, business power, urban demand are factors that contribute to explain what is on the shelves. Many examples proved this thesis: Coca-Cola is one of the first product that manages to reach systematically remote rural areas, certainly not because of spontaneous demand. This case study offers a further perspective to understand how the force of supply drives demand and vice-versa.

Food anthropologists, looking at 'indigenous diet' in the New World, observed how production and consumption arrangements shaped well balanced diets through history, which were adapted to the local environment, methods of preparations and conservation, and technology (Fleuret and Fleuret, 1980). Indeed, staple food is very often non-traded internationally (Dixon, 2009). These scholars highlighted the loss of indigenous knowledge on food, changed as result of the introduction of commercial cash crops (Moore and Vaughn, 1994). The underlying assumption here is that staple food remained spatially and temporally isolated from any form of historical (or colonial) influence or simply from external market forces. In fact, on a similar note Fafshamps describes 'Third World food markets' as 'thin and isolated' (1992:9). Nevertheless, this 'ahistorical' perspective does not address the ontological question about what 'traditional' food is, and what have been the induced patterns of food production and consumption through which this kind of food entered (or not) the market sphere and adopted the status of 'staple food', and yet, if it has entered the market sphere, how it can be identified within the market¹⁷. The apolitical and ahistorical understanding of the study of food markets is here problematized and tested. Indeed, we can immediately acknowledge the ontological weaknesses of the meaning of 'staple' food. As proof of that, studies exploring the methodological validity of the statistics which looked at staple food consumption, showing through daily diaries discrepant contents in the data on food consumptions (Armstrong et. al., 2013). 'Staple' is often standardised based on what is the 'main and important' product traded which raised issues about the ability to comprehend and include more complex and heterogeneous patterns of food consumption.

¹⁷ According to the FAO, in Central Asian region food crops are: wheat, apple, apricot, bean, carrot, grape, melon, onion, pea, pear, plum, rye, spinach, walnut.

The 'indigenous' and the 'internationalist' perspectives of staple food highlight two sides of the same coin, which result in a dialectic between exogenous and endogenous forces dynamically interacting and shaping new forms of consumption depending on multidimensional factors. First, how specific economic/income contingencies affect food supply and demand. Second, how pre-existing values and knowledge interact with new economic and food market supply and ultimately shape the final diet outcomes. Thus, in order to address in a comprehensive way the concept of nutrition security and dietary diversity, it is necessary to include in the analysis the multidimensional drivers that explain the decisions around food choices. Indeed, it has not been explored if and how such market forces shape diet transition in Uzbekistan, where neoliberal policies and international trade had few and peculiar influences on the agro-food policies implemented, the state did not withdraw from agriculture and food markets neither as regulator nor as active actor. Moreover, in this case study a peculiar cash-crop (cotton) is present, which offers an occasion to test if cash-crops are (always) in competition with food (e.g. Von Braun and Kennedy, 1994) as discussed in section 3.2.

At this point it is also important to understand how we measure (quantify) and analyse changing diets. Considering the above, it seems reasonable to ask if a new diet or a more heterogeneous diet always reflects a higher quality diet. Authors and international organizations (i.e. FAO, UNICEF) assert that people with low income eat generally a smaller variety of food and therefore fewer nutrients. Nevertheless, diversification does not mean improved nutrients every time (Fine, 1997; Dixon, 2009; McMichael, 2005). Fine notes how the mainstream analysis assumes that food consumption is determined by a continuity and convexity of preferences which are fixed and rationally determined. In reality, there is a complex and contradictory scenario that determined food consumption outcomes (see section 3.1). In many transition economies hunger and obesity coexist under the hegemony of market 'healthism'¹⁸ (Dixon, 2009). The belief that a smaller variety of food leads to fewer nutrients seems in line with the neoclassical axiom of non-satiation which asserts that the consumer always places positive value on more consumption. However, this research challenges the epistemological desirability of this apparent food diversification. For instance, consuming the same cereal in different processed shapes and forms such as bread, biscuits or pasta does not mean we are eating better, even though our consumption increases, and the utility gets translated in improved well-being. Indeed, such differentiation is intrinsic to

¹⁸ The existence of a moral discourse around food is viewed as an example of 'healthism' in which health is central to all aspects of life and self-discipline is a mean to achieving health (Crawford 2006)

the commercialisation process of food as a commodity and to the subsequent differentiation of its material form. However, it may not add any benefit from a nutritional perspective. Thus, some authors recognize the saturation of the market, and the coping strategy of producers to stretch the market through differentiation “within product lines” (Dixon, 2009:4). We can observe such ‘variety peaks’ in advanced commercialized systems where junk food coexists with premium priced ‘ethical food’. In sum, the hypothesis that eating a greater variety of foods would improve nutrition does not hold.

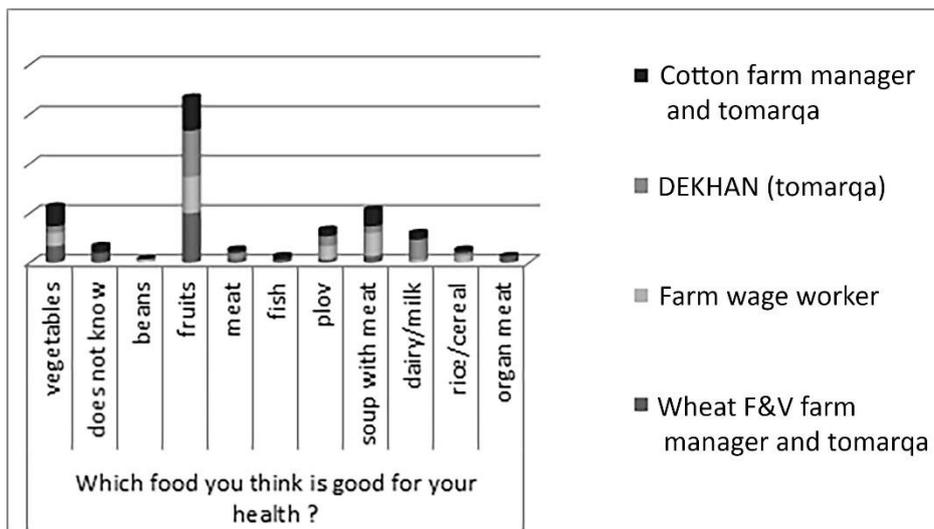
In transition economies, the diet shift can at some point increase the number of calories (and usually through salt and sugar) and can result in worse diet quality because of the lower nutritional content of the food items consumed (Hawkes, 2006). The data reviewed in section 4.3 confirms that Uzbek nutritional status are heterogeneous especially between urban and rural areas, confirming the typical characteristics of transition economies in which wealth and food consumption are polarising. In fact, although data show underweight at 5%, stunting at 19% and wasting at 4% as share in the total population, obesity is also present at 19% confirming how income rise diverts the diet towards fat and junk food (O’Laughlin, 2007; UNICEF, 2015). Thus, determinants of nutrition are multi-faceted and diverse diets may not lead to improvements in nutritional status (Jones et al., 2015). Although this falls beyond the scope of this work, research should discuss the tendency within the existing methodological tools of aggregating or classifying data in ways which are not able to grasp the less obvious aspects of food quality consumption, including the level of nutritional contents or even the preparation methods.

In sum, food consumption is very often not determined by the organic and specific properties of the goods but it is socially constructed and induced (e.g. the concept of taste in Bourdieu, 1984). Hence, an analysis conducted around food should focus not only on the individual behaviours, but also include and understand the normative systemic forces which attribute meaning and value to eating as part of social and market institution (Hoddinott and Wiesmann, 2010). Authors have argued that this aspect has disappeared in the modern form of ‘nutricentric citizen’ where *pleasure* has been substituted by nutritional *guidelines* (Coneney, 2006). The notion of quality of food consumption has been co-opted in the techno-processing discourse which makes little or no distinction between minimally and highly processed food nor in the underlining productive structure that determine unhealthy food consumption (Dixon, 2016; Scrinis, 2008a). Furthermore, the role of the state is fundamental in balancing consumption based on corporation or science messages, which are very often

aligned (Scrinis, 2008b). In chapter 9 I will expand on this within the debate of food regime, by looking at how market forces and state policies hamper or enable different conditions of food availability and access.

So what does ‘food quality’ mean in this context? We now look at the issue of *preferences* and *knowledge*. Trying to investigate this cognitive aspect and map the nutritional values among the respondents, one of the survey’s open question asked respondents *which food they think is good for their health* (Q.61). To have a comprehensive framework on food use, it is in fact relevant to estimate whether the knowledge about nutritional values corresponds to a validated standard or it is constructed and embedded in local beliefs, or linked to class structure. As shown in figure 7.2, the most mentioned food is fruits followed by vegetables. However, when disaggregating the answer by different groups, many among farm wage workers and dekhans considered *plov*¹⁹ and meat soup the healthiest food.

Figure 7-2- Perception of healthy food (in absolute numbers)



Source: Author’s survey data

There are three considerations that could explain such peculiar food choices. The first one is linked to the nutritional value associated to traditional meals. For instance, *plov* is associated with ‘abundance’ in many ways: firstly, because it is organically composed of many food sources such as rice, vegetables (carrots and onions) pulses (chickpeas), oils, and meat. The second one is related to its socio-cultural value, being also present in important life rituals and ceremonies and being relatively more costly than other food. The third one is related

¹⁹ Uzbekistan's signature dish is palov (*Plov* or *Osh* or "Pilaf"), a main course typically made with rice, pieces of meat, grated carrots and onions. It is usually cooked in a *kazan* (or *degchi*) over an open fire; chickpeas, raisins, barberries, or fruit may be added for variation.

precisely to knowledge and perception. During interviews with experts on nutrition from WHO, it emerged that within the rural population there is a misconception related to certain food, such as legumes and milk products that have considered to have negative cold attributes (WHO, 2008). Meat soup has instead a positive connotation also because linked to the capacity of having access to warm foods through gas, wood, or electricity equipment, especially in winter. Also, meaty food is considered a source of strength. These subjective perceptions around food affect diet from the early stage of life and arguably the allocation of food within the household also reinforces such preferences. Not least, there is an issue linked to *availability*. Based on the information obtained from informal interviews and based on observations in local bazars, many farmers simply do not know about the existence of particular greens or vegetables and therefore neither how to produce them. For instance, some specific F&V (e.g. broccoli, zucchini, oranges) are present only in urban supermarkets at very expensive prices (i.e. 20000 sums =4USD\$/kg). This is linked with the idea of 'thin markets', and the fact that the low levels of monetized transactions do not push the demand for wage labour and thus do not boost purchasing power to consume more and new commercial food. However, here is argued that income (demand) is not the only driver of supply. Instead, knowledge, perception and advertising have also a role.

At the same time, certain kinds of F&V are unavailable in winter and the lack of storage capacities exacerbates the risk of 'seasonality in consumption' (WHO, 2009). Nevertheless, it has been widely observed in my fieldwork that, to compensate for the unavailability of F&V in the cold season, domestic food technology practices are widespread for food conservation and preservation methods, such as for instance fruit juice *compot*, and pickled vegetables (*marinotvka* of tomato, carrots, and cucumber). This is not to say that households are operating through rational welfare maximising behaviours (Becker, 1974; 1981), nonetheless such coping strategies contribute positively to the nutritional status of the population offsetting issues linked to seasonality and being also rich in probiotics. In addition, abundant female domestic labour-time justifies the persistence of such forms of food skills²⁰. Therefore, these practices are indicative of the perpetuation of a relatively closed agrarian market which helps to maintain monotonous patterns of consumption. This is extremely relevant for the debate about diet and food market transition. Indeed, the nature of commercialised food in the market compels its availability across time and seasons against

²⁰ And not least the obvious lack of seemingly labour-saving devices such as washing machine, dishwasher, and sewing machine etc. (Fine, 2013). The neoclassical perspective assumes that time is linked to rational decision but we know that the time of women household members is valued less than others.

its intrinsic natural cycle. In order to guarantee its permanent presence on the market, fresh food is ultra-processed and loses many of the nutritional values it should contain to benefit its consumers (Monteiro et al. 2010; i.e. ‘imperial empty calories’ in Dixon, 2009). This argument underlines that food is explanatory to assess the level of sophistication of the market. In this case study the lack of supply of particular processed food can be explained by the low level of liberalization of the Uzbek markets.

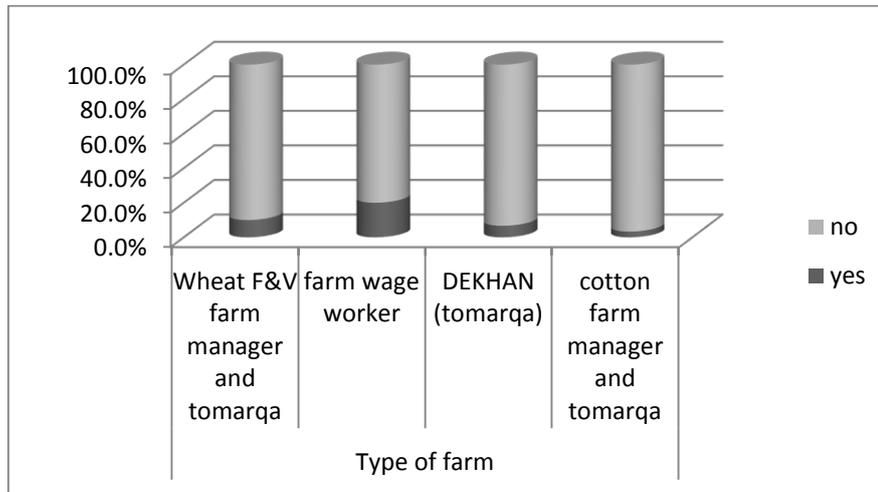
7.3 Food Access

In this section, I am going to outline the results related to food security (FANTA) and Individual dietary diversity Index (IDDI) gathered through the survey and complemented by primary observations and open questions. These components will inform on food access. As already explained in chapter 5, these methodologies have both limitations and benefits. The choice about these two tools has both practical and substantive reasons. Firstly, those methods allow reproducibility and time-efficiency (see section 5.5.1. e.g. Shetty, 2009). Also, IDDI has been considered by nutritionists and policy makers as a proxy for diet quality because it can explain, with the limitations outlined earlier, characteristics of food consumptions (Ruel et al., 2013). However, because I have disaggregated further the information, it has been possible to grasp a more detailed diet composition of the individual respondents. In conclusion, these two indicators have been used but tailored and expanded to serve a wider understanding of the characteristics of food consumption as an additional lens to grasp dynamics of class differentiation, food availability and commercialisation.

7.3.1 Food Security

In this section I look at food security through core questions of the FANTA module, which, by assessing hunger, supports the understanding of physical and economic access to food. As already mentioned, there are some limitations about this method. First, it captures only food quantity and sufficiency. Second, it is a snap-shot of the last months taken in the so called harsh season, meaning that does not grasp consumption of milder seasons (i.e. summer) or dynamic trends. Last, it is based on the subjective judgement of the respondent. Indeed, it is undeniable the risk of bias in the answers, which can be influenced by feelings of pride or shame based on their impediments in consuming more, healthy or expensive food (Jones et al. 2013). For these reasons, it needs to be triangulated and complemented with additional tools and data to grasp the causal mechanisms.

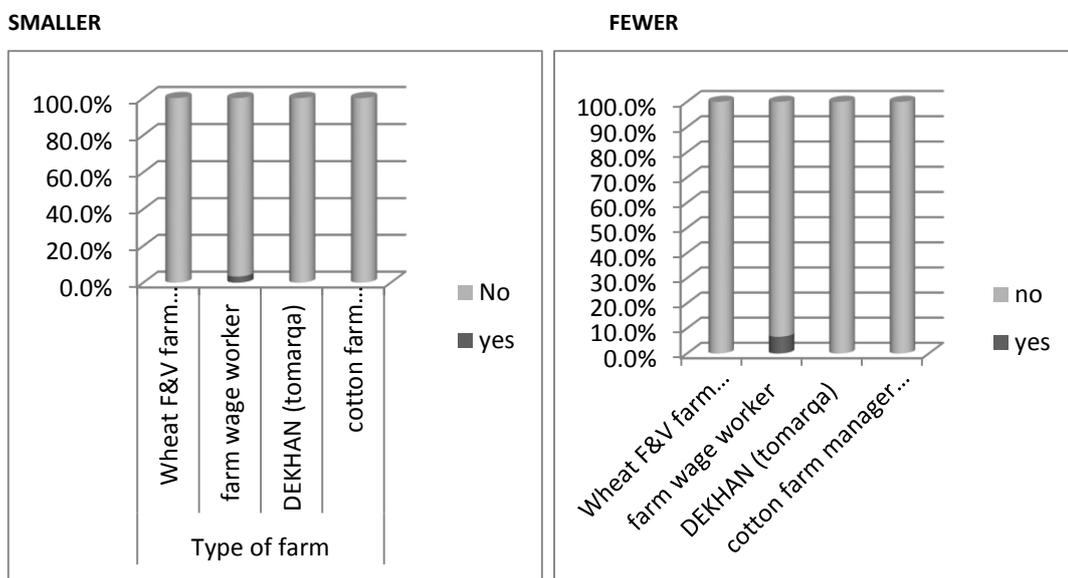
Figure 7.3 - Q 49: In the past four weeks/30 days, were you or any household member not able to eat the kinds of foods you would have preferred?



Source: Author's survey data

Figure 7.4a -Q51: (right) In the past four weeks/30 days (1 months), did it happen that you or any household member had to eat fewer meals in a day because there was not enough food?

Figure 7.4b -Q 53: (left) In the past four weeks/30 days, did you or any household member had to eat a smaller meal than needed because there was not enough food?

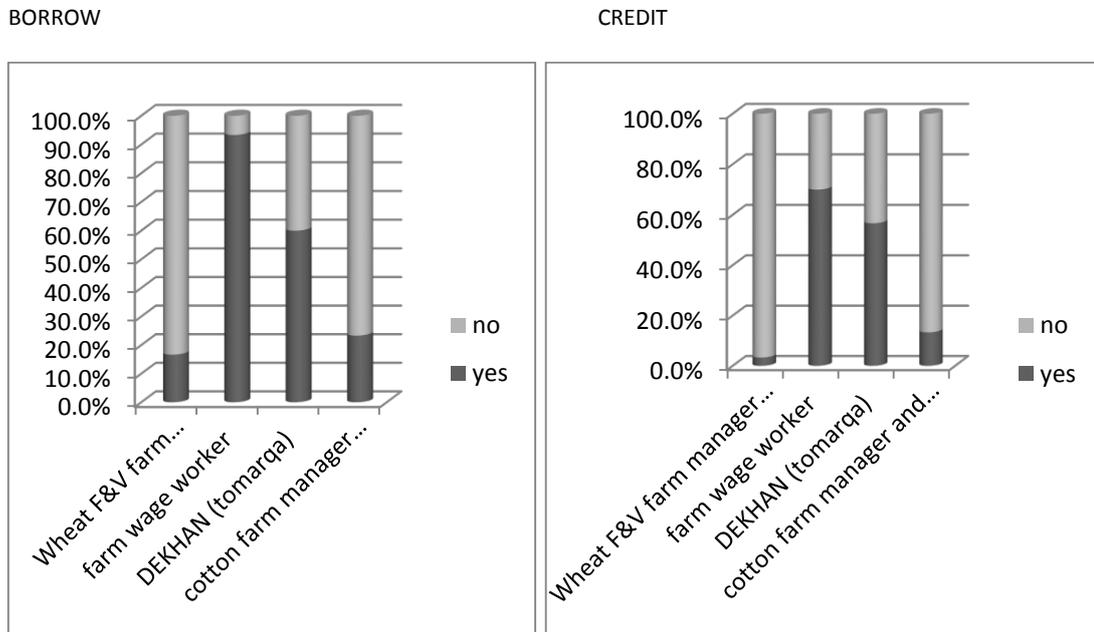


Source: Author's survey data

Based on Stevano (2014), I have added other two questions to complement the FANTA questionnaire, to expand the understanding of food provision, and to better understand the sense of reciprocity and favours (see chapter 4).

Figure 7.5-Q59: (below right) In the past four weeks/30 days, did it happen that you or any household member had to get food on credit from a shop or trader?

Figure 7.6 -Q57: (below left) In the past four weeks/30 days, did it happen that you or any household member had to borrow food from relatives or neighbour?



Source: Author's survey data

The results in the four figures above show that, although Dekhans and farm wage workers did answer that they do not face conditions of harsh food insecurity, they widely admit to rely often on community networks, meaning through credit at the local shops and through borrowing and barter within the *mahalla* (local village) to access food regularly. This is possible because norms linked to sharing, reciprocity and redistribution among the community are still vivid and necessary (Kandiyoti, 2003). In fact, some literature tried to review the community-level factors that influence and affect nutrition impacts and this context offers a good example of subsidiary food provision based on non-wage relations and proximity (OECD, 2001). Indeed, the *mahalla* is also a historical administrative organization which sets up mechanisms of mutual aid and support in the community such as social finance or mechanisms of social security, for instance by providing help when vulnerable family's members are in need because of accidents of illness (ibid). Also, sometimes the Mahalla can even recommend or guarantee for an autonomous farmer to obtain a loan from an agricultural bank (ibid). That proves once again that informal mechanisms of cooperation and exchange in this context often replaced more 'institutionalised' and sophisticated forms of

exchange, namely through the monetised market or the state. Nonetheless, this satisfy a need present among dekhans and farm workers, which in this case is food.

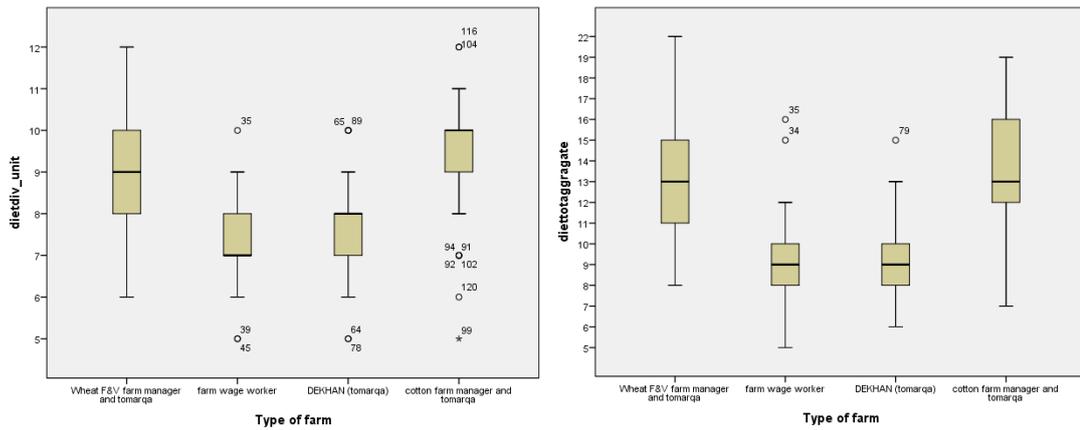
7.3.2 Dietary Diversity

In chapter 6 it has been argued that this case-study does not reflect the standard process of commercialisation, because production is highly mediated by the state. As result of crop-specific access to means of production, engagement with state and market channels and patterns of accumulation, I have assessed a differentiation among state crop, farm managers as opposed to small holders producing food crops. However, such market-state mechanisms affect also food distribution and consumption, for instance on wheat. In this section I will investigate how such differentiation informs dietary diversity.

As mentioned in chapter 5, IDDI helps gathering information about the amount of food groups (and in this exercise also related items) consumed by individuals in the last 24 hours. There are both strengths and weaknesses in adopting such indicator: some of the limitations are that it does not provide information about the quantity or frequency of food consumed, and it does not quantify the food gaps. Also, IDDI does not identify a clear quantity of food groups which can be considered a satisfactory threshold. Done at household level, it ignores the asymmetry within the household.

Nevertheless, IDDI serves unveiling the individual access to a variety of food and to a certain extent it informs about the characteristics of the food market. For these reasons, in the construction of the IDDI, it has been decided to use not only the standard food groups designed and widely used by FAO and others, but to explore also the components within those groups. It is in fact believed that those can reveal more and better insights about the different consumption patterns among different types of farmers. In other words, to assess the variance of food consumption within and across groups, I have disaggregated for each food group the elements by which they are composed. I have assessed 15 food groups. I have merged tubers and white tubers as it was a more accurate reflection of the availability of those (yams, sweet potato and cassava are not present in Uzbekistan and are not even imported). Food groups are designed by FAO to reflect nutrient and calories similarities. While through the FANTA indicators was hard to grasp significant contrasts, IDDI shows a more heterogenous picture with regards to particular food groups which are going to be outlined later.

Figure 7.7- Box plot on dietary diversity by food group (left) and food type (right)



Source: Author’s survey data

In the two box plots in figure 7.7 are represented the variance within the four different types of farmers of food items and food groups respectively per food group (5-12) and by food type (5-22). In both cases, although there are some outliers²¹, the F&V *farmers* have the best nutritional position (most of the respondents consume between 10 and 11 food groups) followed by cotton manager (between 9 and 10) and farm wage workers and *dekhans* (between 7 and 8). There is also a higher variance within farm managers, meaning that the differentiation of the diet patterns within this group is much bigger, proving that there are inequality to look at within those respondents.

Table 7.1- Dietary diversity across farmers

%	Wheat& F&V farmers	Cotton/Wheat Farmers	Farm wage Workers	Dekhans	Legend
Cereals	100	100	93	83	< 60%
Tubers	100	100	97	100	31-59%
Meat	93	100	77	83	0-30%
Dairy & Milk	60	80	67	33	
Fish	10	6	3	3	
Pulses	59	60	27	40	
Fruits	72	70	43	77	
Dark green Veg	23	30	10	3	
Vegetables	97	70	40	35	

Source: Author’s survey data

²¹ Sometimes interviewees went to a wedding the day before of the interviews

In table 7.1 it is outlined the percentage of farmers (by type) that have access to particular food groups. *Dekhans* and Farm workers hold the most vulnerable position in the index for dark green vegetables but farm wage workers rarely consume pulses and fruits. Cereal, tubers and roots occupy the biggest share of the diet across all the groups. This is due to the fact that wheat is a 'socialised' crop, thus widely accessible, whose system of provision will be explored in chapter 9. Potatoes, although based on market mechanisms, are also widely available and affordable across all groups. However, other food groups such as vegetables, fish and in some cases some specific types of fruits are not consumed frequently across all the groups and especially by the *dekhans* and farm workers. Dark green vegetables are consumed by a small percentage of farmers, but paradoxically in similar frequency by *dekhans* and *farmers* manager. I observed *dekhans* with greenhouses to produce and sell such nutritious vegetables. The same heterogeneous results among strata are actually present for dairy products, and animal source proteins, which see *farmers* manager eating more of such products. It mostly depends on whether the farmer owns a cow or not. However, even in case he/she owns one or more animals, sometimes farmers confirmed that they do not consume the product, but prefer to sell it. This proves that where the market price return for a specific crop is considered profitable or when there are no alternative sources of income, the exchange-value overcomes the use-value of the product among poor farmers creating substitution effects with personal consumption.

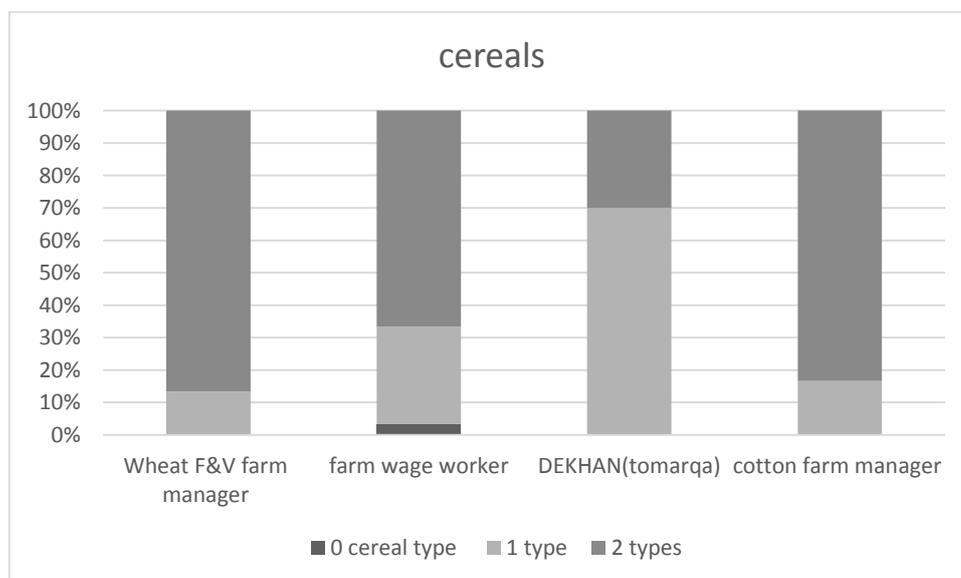
Within the same food group there are also composition effects. For instance, within the 'fat' food group, sunflower oil is a condiment consumed only in small percentage by F&V-wheat *farmers* managers, and not at all by the other groups which still widely consume the more affordable cotton oil. Another example is that, in many *dekhans*, rice-based meals are being substituted by other carbohydrates sources such as potato (domestically available) or old bread. This is because household does not produce it thus it does not have direct access to this staple, if not through the market. Moreover, the price of rice, although is partially controlled by the Government and set up through quota production, is extremely sensitive to inflation, both formal and informal, and considered as an expensive type of food by very poor *dekhans*. Therefore such 'substitution practice' within the same food group is linked to issues of affordability. Such observations demonstrate how important it is to look more in depth than the food groups classification of IDDI, since singular food components can unveil patterns of market access.

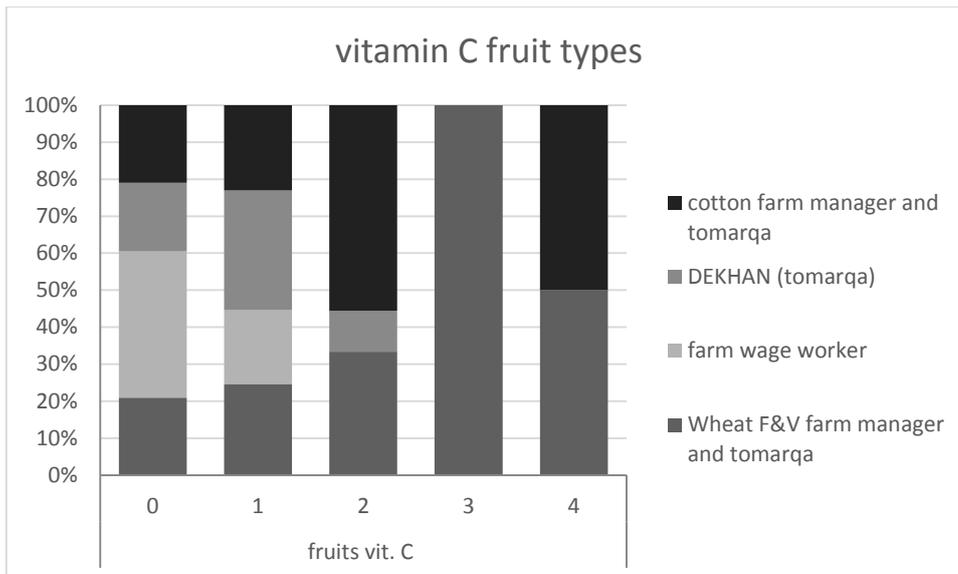
In conclusion, across farmers diet seems to be sufficient in terms of calories, but in some cases extremely monotonous, relying mostly on cereals and tubers, and meat and fruits only when available within the household production. Indeed, dekhans have higher consumption rate than farm wage workers on labour-intensive crops such as fruits and vegetables. In particular, it has been observed that those who engage in seasonal or permanent agrarian wage jobs, tend to cultivate less and less types of food crops in their domestic plot (*tomarqu*). This has to do, as already mentioned in chapter 6, with time constraints. It is evident that, among the poorest strata, when some particular kind of food are not present in the domestic production, the capacity to procur from the market is very low, sometimes due to the physical distance from the market, or to lack of availability, because of economic reasons, or sometime for a combination of those. However, as explained in chapter 4, farm wage workers benefit from accessing land hence food directly from the workplace. When this option is not viable, farm wage workers are less exposed to a fruit and vegetables oriented diet.

7.3.2.1 Additional measurements on dietary diversity

As previously mentioned, in order to assess the ‘real’ quality and availability of food consumed, it is necessary to go beyond the standard classifications of the dietary diversity tool and understand the degree of diversification within those food groups. For instance, an additional exercise has been looking at the quantity consumed of the same food group. It is argued that such investigation provides an understanding of the degree of commercialisation, here meant as higher intensification therefore higher availability of particular food.

Figure 7.8- food counts of cereals and fruits





Source: Author's survey data

As observable in the figure 7.8 above, I tried to assess whether different groups of producers consume different types of cereals and vitamin C fruits. *Farmers* managers, although, as we will see, rely mostly on their subsistence circuit to satisfy their basic needs, at the margin of their higher consumption rely on the market to diversify their diets, through imported fruits or simply by buying products that they do not produce. In this case affordability and availability issues are strictly connected and dialectically informed. Demand is a condition sine qua non for such products to be 'on the market', which confute the Say's law classical assumptions that supply creates its own demand. Nonetheless, demand and supply are circular: because those products are not widespread, their price make them affordable only to the few, hence it does not boost their demand.

IDDI does not have a threshold which defines what a positive or a negative outcome is. IFPRI proposes to use the following thresholds: 6+ = high = good dietary diversity; 4.5 – 6 = medium dietary diversity; Below 4.5 = not adequate. If we follow these criteria, we can see from the table below that only 5 respondents out of 120 scored 5 or less than 5.

Figure 7-9 - Counts of food groups by type of farmers

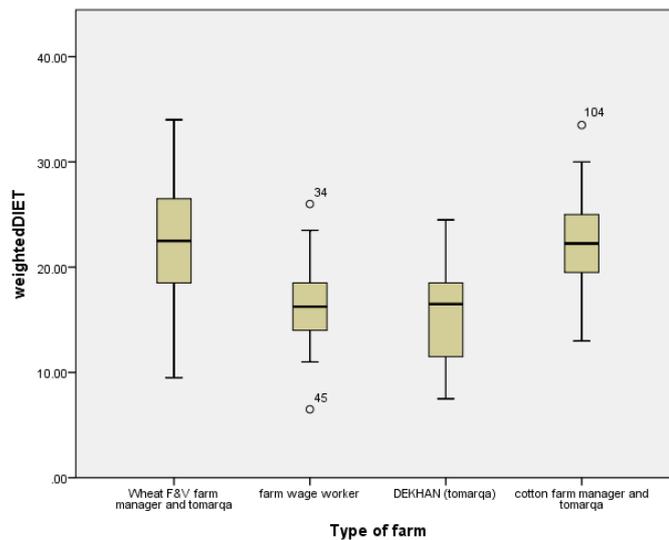


Source: Author's survey data

A further limitation not yet mentioned is that IDDI gives equal relevance -weight (1) - to each food group. The food consumption score developed by the WFP (2008) assigns a weight based on an estimation of the nutrition density²². Animal source proteins such as meat, eggs, dairy and fish have a weight of 4, pulses of 3, cereal and starch of two, fruits & vegetables of 1 and oil and sugar of 0.5. This criteria tends to give more importance to food such as fish and meat rather than sugar. Figure 7.10 shows that the differentiations among farmers, although confirmed, are more homogenous. The small variance is symptomatic of the systemic form of food provision specific of this context where low level of commercialisation are in place.

²² Nutrient density accounts for caloric density, macro and micro nutrient content, and actual quantities typically eaten (WFP, 2008).

Figure 7.10- Weighted dietary diversity index



Source: Author’s survey data

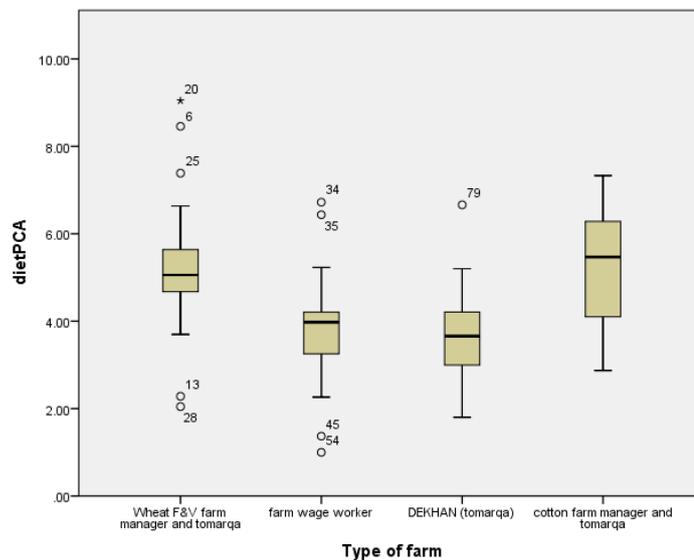
However, following the typical threshold that considers a poor diet a score under 21, between 21-35 a borderline, and 35 acceptable, 64% scored poor and 36% scored borderline, with none scoring more than 35. This unveils important implications in terms of ‘high-end’ (i.e. luxury) food consumption.

Indeed, based on interview with WHO, stakeholders and survey results, one more observation worth mentioning is the very low consumption of processed food and in particular of sweets and pops (coca-cola, etc.). This is peculiarly different from the usual clash between local and junk food occurring in many developing countries (See section 3.1 e.g. Popkin, 2003; Hawkes, 2006). In Uzbekistan, Nestle and Coca-Cola form practically an oligopoly in the national distribution of non-alcoholic and soft drinks, in particular pops, water and milk in urban areas, proving the trading and economic power of corporations in food industry (see chapter 9). Such vertical penetration of multinational food industry in the beverage sector is nevertheless highly regulated by the state and it coexists with forms of food autarky at the micro level, which survive not only because many households don’t have economic access to commercial food, but also because cultural norms reinforce household food production. Furthermore, Coca-Cola is a cold and fizzy drink which is not perceived positively within the customised meals which are usually accompanied by warm tea. Therefore, the westernization of local diet is something less present in Uzbekistan in comparison with other developing countries (Popkin, 1998- i.e. coca-colonization). How local

arrangements of food production and consumption clashes with global forces to shape the Uzbek food regime will be analysed in chapter 9.

Lastly, the same analysis has been conducted through a PCA. The sample data on dietary diversity have been decomposed into a set of linear varieties in order to assess those elements that occupy the biggest loading (differentiation) among the different food groups. The index simplifies data and relates it to underlying patterns. It is used to assess the nutritional outcome of the different type of farms and secondly to use it as a proxy to analyse the causality and mechanisms of the particular channels of consumption. Same results confirmed here where pulses and animal proteins products registered the highest loading (see appendix X).

Figure 7.11- Dietary diversity Index through PCA



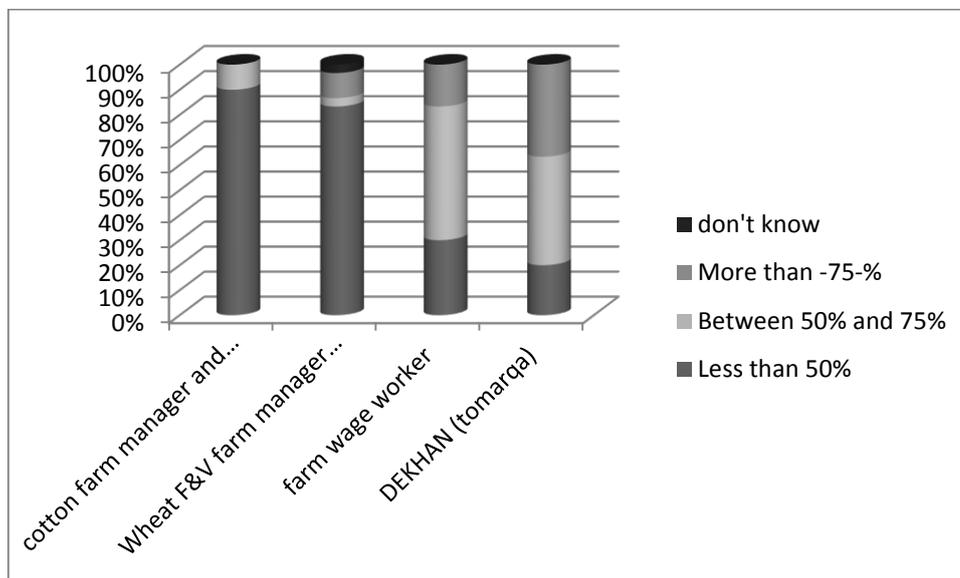
Source: Author's survey data

In this section we have tested whether different methodologies would produce different results. From what has been explored it has emerged a very complex picture which raised the importance to analyse not only which farmers' group has the best or worst nutritional diversified diet, but also what trigger such outcomes, namely income market, cultural norms, or even broader political strategies. And last but not least, how methodology helps to frame and understand the information out there.

7.4 Affordability, provision and prices

In this section I analyse the dimension of food *affordability* and modalities of *provision*. The next two questions are not part of standard food security questionnaire however, I have developed and included them to inform on modalities of food provision in relation to the market. In other words, to quantify the dimensions of *commercialisation* as opposed to *subsistence* in food consumption (Von Braun and Kennedy, 1991). Lipton for instance suggested a natural break between poor and extreme poor (2009): extreme poor would spend more than 80 per cent of their income on food although receive less than the required calories. Figure 7.12 here below tested whether this threshold occurs.

Figure 7.12 -Q48: Over the past month, what was the proportion of your total expenditure that you spent on all types of food?

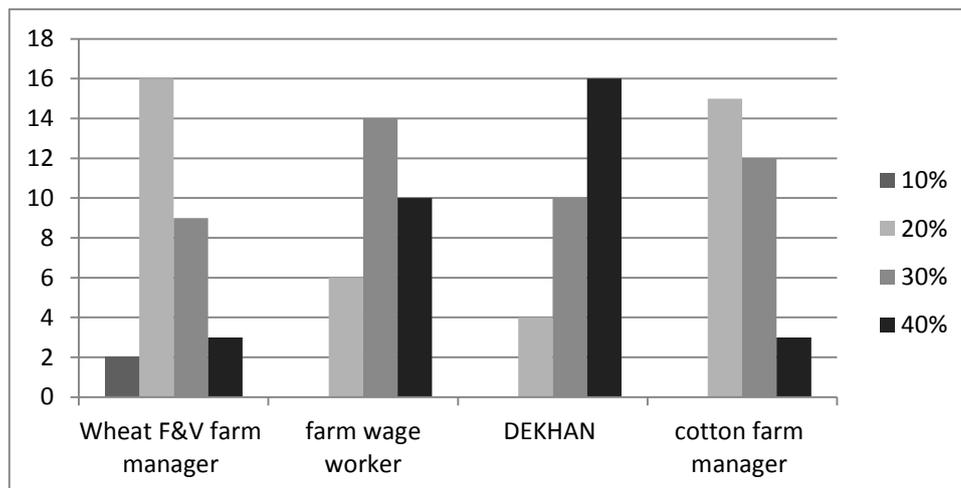


Source: Author's survey data

The result seems to confirm Engel's law which states that as income rises, the proportion of income spent on food falls. Indeed, most of *farmers* manager, both involved with cotton and wheat and identified as the wealthiest categories in previous chapters, spend less than 50% of the total expenditure on food whereas dekhans and farm workers spend over 50% in most of the cases, with peak of over 75% in many cases. These results complement the YRPS (Uzbekistan Regional Panel survey) conducted in 2006 that found out that urban households spend on average 33% of their budget on food, whereas rural household allocated around 53% of their resources on food (WHO, 2009). Our survey shows therefore a more accurate differentiation even among rural spending.

Nevertheless, what is less obvious is that *farmers* managers are less dependent on the market for food consumption. Specifically, the survey included a question about what is the percentage of food that the respondent is obliged to buy because not self-produced (Q.47 Figure 7.13). A similar question is for instance used in Levin et al. (1999) to assess the level of vulnerability of food consumption. Although this method has some limitations, it is still illustrative to develop a discussion on the relationship between the level of income and food expenditure. Indeed, *dekhans* scored the highest rate, namely the biggest share of 40%, with *farmers* manager having a very low reliance on the market for food provision. In other words, the larger and more intensive *farmers* managers depend largely on self-provision for food acquisition instead of small-holders which rely more on the market. As previously outlined in chapter 5, the larger land (and employed labour) available make them able to access a bigger variety and quantity of food-crops to satisfy their individual demand which, nevertheless, is not sold but used for the immediate use-value.

Figure 7.13- Q47: What share of food you are obliged to buy because you don't produce it?

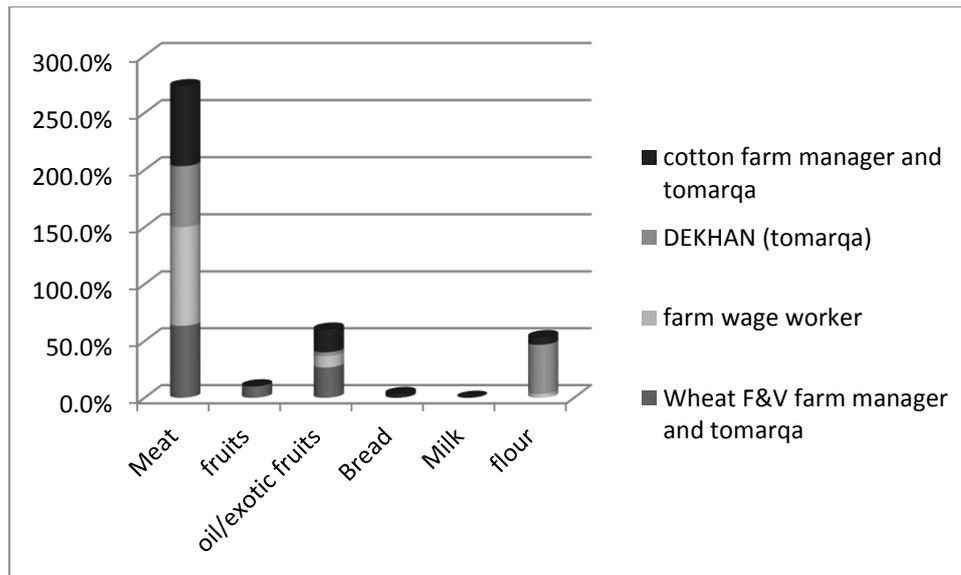


Source: Author's survey data

Indeed, *dekhans* stand out for answering 'flour' as the most expensive food to buy in contrast to meat for farm manager (figure 7.14). This means that the main ingredient of their daily meals, used for bread and noodles, needs to be bought in the market by *dekhans* as non-market channels are not accessible through labour relations. By contrast, as per survey results, more than 90% of the respondent farm wage workers receive their salary through in kind compensation, namely in wheat or land (after harvest). Therefore, farm wage workers are less vulnerable from food market mechanisms to satisfy their cereal needs because involved in large farm production. However, this evidence suggests that they suffer the same barrier

to money as ‘means of payment’ as *dekhans*, because compensations and exchange are based on barter, confirming so-called ‘demonetisation’ (Kandiyoti, 2003). Such lack of acquisition of money as reward for their work has a negative effect for the welfare of farm workers because it excludes them from the circulation of marketed forms of goods, services and accumulation of capital. Nonetheless, such in-kind compensations are an important source of staple food in absence of alternatives.

Figure 7.14 -Q62: Which food you think is the most expensive at the market?



Source: Author’s survey data

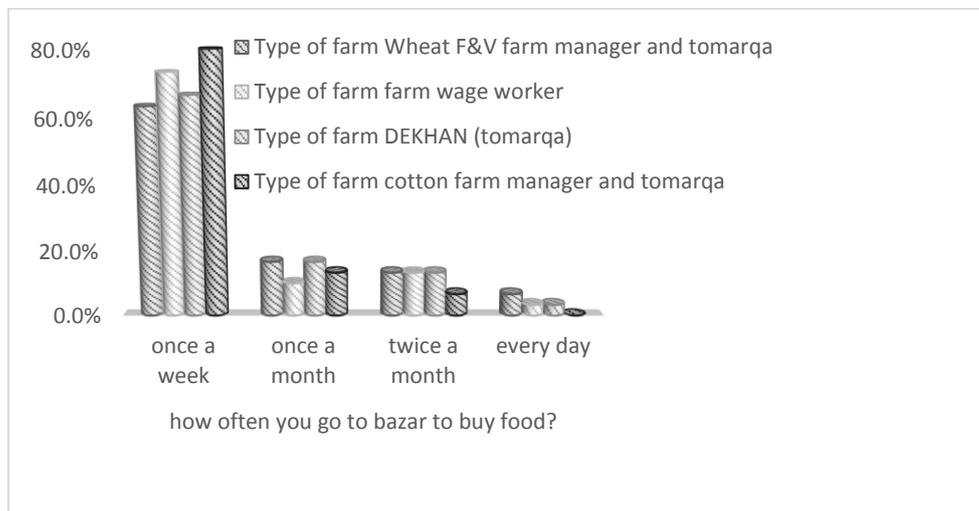
So far results show that food choices are in reality determined by economic conditions, and the characteristics in the diet have in fact expressed such discrimination. At the same time, poor classes can still desire expensive food. As already shown in section 7.3.2, fish, more expensive than meat, is consumed almost exclusively by wealthy people. Imported fruits like banana or pineapples, available only at the market,²³ cost three times more than local fruits. Such kind of ‘luxurious’ foods were emphatically mentioned by the respondents during the interview as to underline their privileged status. By contrast, among poor respondents, very basic ingredients such as flour and oil have been sometimes included in the list of expensive food. Also, farm wage workers and *dekhans* pointed at meat as a luxurious food. Processed meat is bought less frequently by *dekhans* (average once a month) in comparison to farm managers (once a week in average). Another example of cost differentiation as determinant of consumption is wheat. It is available in the market in two forms: imported (Kazakh and more expensive) and the Uzbek one, recognised because yellow and famous to have lower

²³ Bazar price: lemon 1000 s/ each; banana 14 000 s/ each; pineapple 24,000.

baking quality. The latter is consumed by the poorest strata of the population and/or by the wheat producers and farm wage workers. Although such product segmentation will be explored further in chapter 9, from these observations two considerations can be already be made. First, that there are emerging examples of conspicuous consumption (Fine, 2016) which coexist with instances of struggle for staple food. Second, it can be argued that different income elasticity of demand for food are present also within the same food type, in this case for instance on imported and national wheat, which cannot be grasped by the standardised category used in the available methodology.

So far I tried to clarify what is actually available in the market and to which extent food is physically and economically (or even monetary) accessible. One last point to be made is related to the link between production and consumption. Indeed, access to food passes through its distribution. In rural Uzbekistan food are mainly sold at the *Bazars*. In the absence of good distribution networks, the local *bazar* represents the ‘market’ for the rural population to access the marketed supply of food. Whereas in the urban areas bazars are open every day and offer a multitude of sellers and products, in remote areas *bazars* can be open even just two days a week and only for few hours (usually from 7 a.m to 2p.m. in the winter season).

Figure 7.15- How often you go to the bazar to buy food?



Source: Author’s survey data

Furthermore, interviews in the most remote villages reported that they are very distant from the bigger commercial centers. As consequence, the availability, variety and freshness of some food is compromised. Therefore, because of the small range of food available due to thin and rarefied distribution channels in rural areas, and because of the low levels of

production differentiation, (see section 2.5), some varieties of food do not reach the tables of even rich farmers. When market is suppressed in conditions of scarcity, the risk is that it won't go forward. Thus it is here argued that, in this case study the lack of 'diversified' diets is not only a matter of food access (demand) but it is also the result of market infrastructure deficiencies and lag of supply which perpetuate conditions of self-subsistence of provision. Consumers are there, but satisfy their 'demand' through informal channels. This circumstances support the Marxist theory that consumption is contingent to the production, distribution and circulation of value (assumed here in the form of goods), namely the supply side. If not pushed through a further commodification of the social relations of production which will increase forms of wage labour, therefore create a mass of (dispossessed) consumers, food market will not take off (densify). Nevertheless, such scenario will not ensure an improvement in the quality of the food commercialised.

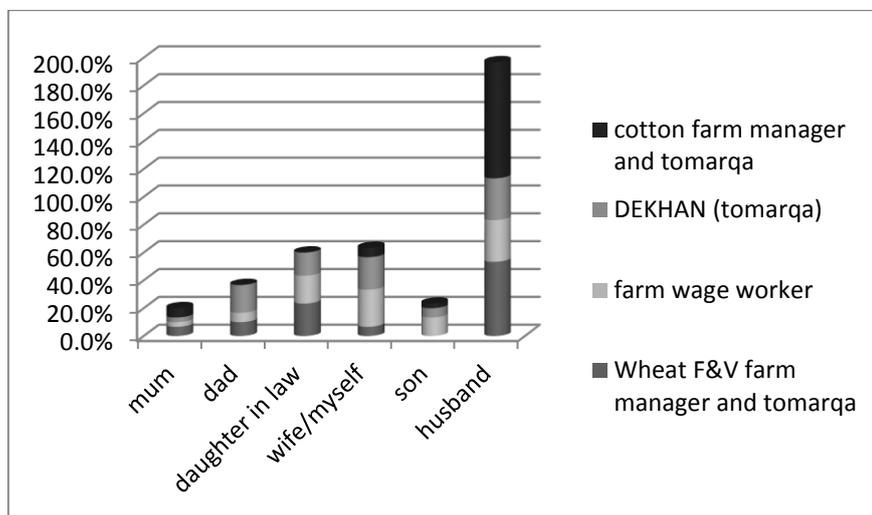
These results inform the debate on the relationship between income, markets and food consumption. Food consumption and the modalities of provision are confirmed to be indicators of class differentiation. These food demand patterns inform and reinforce the strong relationship between income and nutrition. In sum, food access relates to the "socially recognizable claim that a person holds on the available supply of food" (Staazt, 2000:2). That claim is usually recognised though the ability to buy something for the demanded price, or by owning the resources to produce that good. In fact, income, or wealth, increases the demand of food or the ability to produce it. However, in the sphere of the exchange, we need to consider not only the issue of availability but also the volatility of prices which adds a further pressure and vulnerability to the real income of poor farmers (see price seasonality table in appendix VI). Indeed, prices are not shaped by the atomistic forces of supply and demand but are influenced by personal interactions of favours, personal interdependence and obligations, often bypassing or subsidising the circuit of formal market exchanges (Calitsay, 2010; Bargawi, 2014; Fine, 2016; 2003). For instance, in the case of cotton and wheat the minimum guaranteed price by the state bear a political connotation that does not follow criteria of market competition or profit. In slow transition economies such as Uzbekistan the market economy is thin and money as unit of measurement and exchange is less important. The low monetization of exchanges makes automatically label it as economically inefficient although it still resolves, sometimes asymmetrically, the exchange contracts between the users involved. Therefore, that does not mean that productive economic dynamics do not exist and do not produce use-value through final consumption. In conclusion, it is almost as if cash-crop and food-crops are in this context the opposite of the definitions outlined in the

literature (see section 2.1), where cotton is an indirect driver of food whereas food crops are more intrinsically influenced by money, wages and market circuits.

7.5 Food, Gender, and time

Another point worth investigating is the gender dimension on how food is provided and accessed. As discussed in section 2.3.2, intra-household dynamics play a huge role in social relations of agrarian production. To illustrate the dynamics linked to the gendered access to food, one question asked in the survey was related to who goes to buy food at the market (Q.34). In the great majority of the cases, the activity of food shopping is something peculiar to men (either under husband, son, dad etc.).

Figure 7.16-Q34: Who goes to buy food in your family?

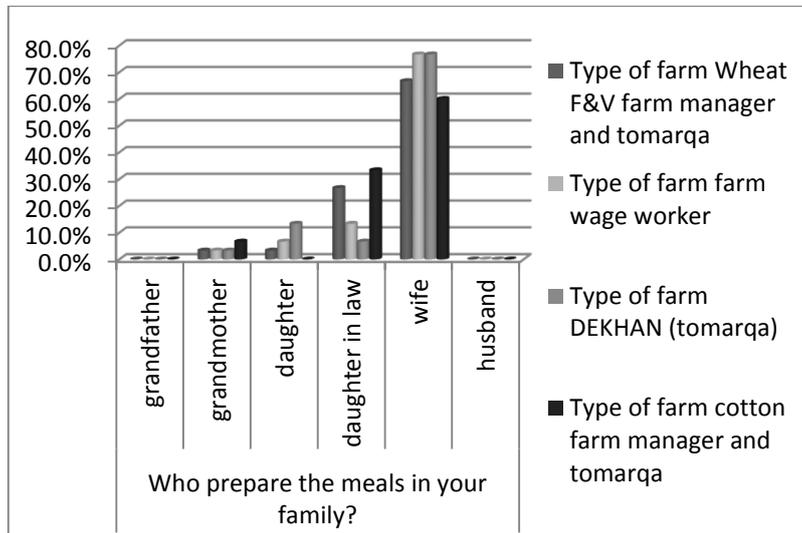


Source: Author's survey data

Based on interviews with male respondents, for men, going to buy food to the market is a way to avoid sharing money with women. The allocation of money could affect what food is purchased. From in-depth interviews (Female teachers, Samarkand province) it was reported that women living in rural areas are often excluded from the money circuit. Even if they work and receive an off-farm wage, in many cases it is controlled and managed by the male. In this sense, it is relevant the point made by Folbre (1994) in which income can extend the space of the women bargaining power (and consequent purchasing power) but also expose her to dynamics of 'expropriation'. However, the factors that constrain female decisions are not only ascribable to the household but also to the kinships and communities. By the same token, the fact that men deal with food shopping does not mean that the burden of domestic unpaid tasks is equally redistributed between genders. Indeed, except from *plov* which is a typical

male cooking activity, survey results show that food preparation is a responsibility of women, either identified as wives (80%), daughter in law (around 10%) (*kalin* or *nivieska*), and in fewer cases daughter (in case adult women are engaged in non-domestic jobs). Interestingly grandmothers exercise a generational vertical power along the same gender line.

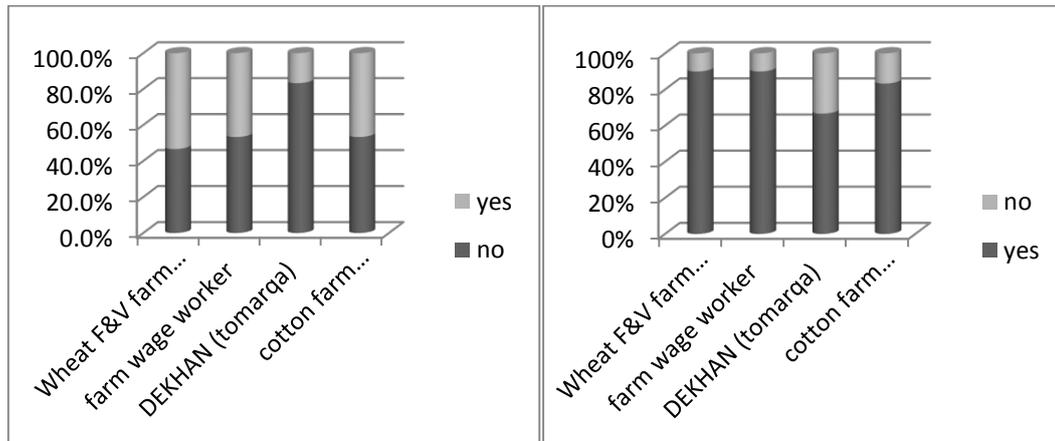
Figure 7.17- Q35: Who prepare the meals in your family?



Source: Author's survey data

Furthermore, when asking to farmers whether his mother/wife work, (Q37, figure 7.18) many men answered “no”. However, it has been necessary to disentangle this answer. Indeed, when the answer was “no”, when asked to specify whether such woman was ‘helping’ with the farm, “yes” was the predominant answer. Thus, women’ role in the productive activities is perceived as ‘help’ rather than work. Such perspective of reality affects the way information, inputs and assets are distributed (Agarwal, 2012) and the women’s ability to negotiate intra-household resource allocation (Doss, 2013). To confirm the observations provided by Doss (2010, in Agarwal 2012), observations confirmed that women usually take care of the livestock and of the household plot, thus playing a crucial role in food production, processing, and preparation. Furthermore, this raises issues around the recognition and classification of women’s work in society and the consequential rewards allocated to them.

Figure 7.18- Q37-38: Does your wife/mother work outside home? (L) Does your wife/mother work in the farm? (R)



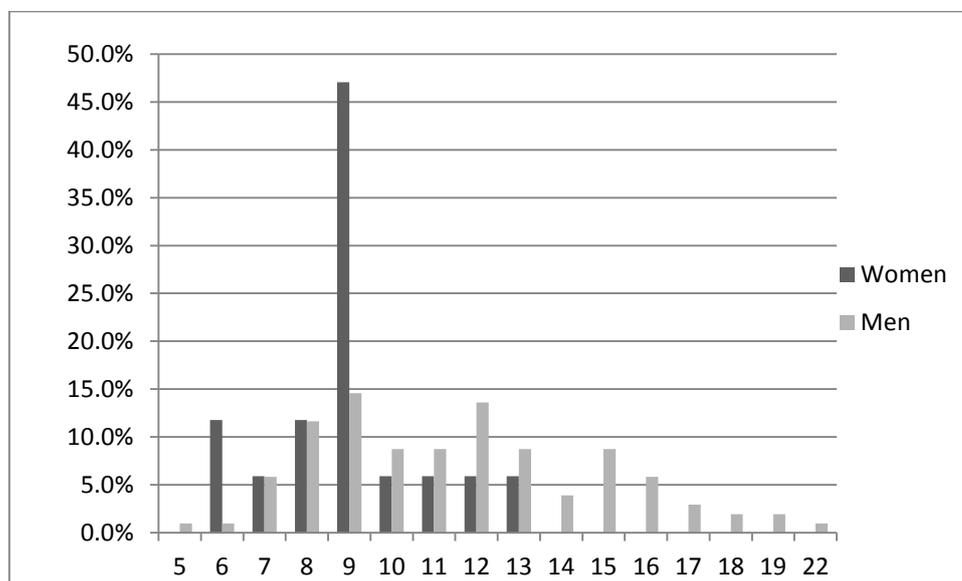
Source: Author's survey data

However, this results tentatively suggest that women do not engage much in non-domestic labour, but this is also due to the fact that none of the household members seem to be engaged in any form of farm or off-farm wage labour. In this sense, it is important to consider the lack of job opportunities in the Uzbek rural labour market, which is arguably due to the still insufficient volume of investments in added-value sectors. Indeed, there are some examples of agribusiness which hire women, but that is not a widespread reality especially in cotton areas. Furthermore, based on the data gathered from the semi-structured interviews with agribusinesses in Samarkand, women' salaries tend to be lower than men. Women employed in agro-businesses face long working hours far from the household and those who cannot reach those firms remain in their role of domestic workers, and 'informal' care takers without a direct source of income. However, unless public expenditure and social norms would redistribute tasks, working outside home can create for women unintended double burdens linked to the duties of reproductive work (Kabeer and Natali, 2013). In this sense income and job cannot be a unique indicator of empowerment if those won't imply transformative changes in the gendered division of labour.

Nevertheless, the gendered domestic labour segregation is definitely confirmed by the observation conducted in many *hokimiat* (local admin office) where women were rarely or never participating in the meetings on farming management (Kandyioti, 2003; 1999). Although the relationship between women and landlessness is not the focus of this research, from interviews, land titles are almost entirely held by men, although not clear jurisdictional or institutional barriers prevent women from being entitled to manage a state-crop farm.

Being out of the circuit of land management of cotton and wheat means also a lag in the access to credit, and other critical inputs such as tractors, and fertilizers. In one of the interview in the Ishtihan district, a cotton farm manager revealed that because of its many businesses (i.e. constructions and car repair), his wife was the ‘official’ manager of their large farm, where she acted as figurehead. These results inductively contradict the general assumptions behind the neoclassical homogenous model of household where no asymmetric power is involved. In conclusion, domestic unproductive workload, bargaining power and resource distribution and access are skewed against female’s members who are the responsible for household social reproduction tasks.

Figure 7.19- Dietary diversity by gender



Source: Author’s survey data

Finally, it is important to investigate the inequalities in food consumption between male and female. Although the sample size was not balanced between men and women, figure 7.19 (which shows from left to right an increasing number or food types consumed) shows that women, in proportion, consume a smaller variety of food groups relatively to men. This can be linked to two reasons: first, to the fact that the male in the household is the one managing the budget of the family even if women engage in off-farm professional activities, typically public jobs. Second, with the fact that male eat away from home, especially for lunch in the *chaihona* (tea room), having therefore access to a bigger variety of food (Farfan et al., 2015). The worse dietary diversity for women can have critical implications for children’s health (Sraboni et al., 2014).

This last point is connected to the essential aspect of preference, and the importance of parent's knowledge on what is quality nutrition. In fact, as mentioned in chapter 4, a report conducted by WHO (2009) suggests that important food groups such as vegetables and meat, are introduced in the diet of children relatively late in rural area, and certain food is avoided because of misconceptions about low temperatures, such raw (cold) vegetables. Although the issue around women health falls beyond the scope of this research, through such multilayers asymmetries between the men and women interviewed, we can nonetheless confirm that gender plays indeed a key role in the patterns of food consumption.

7.6 Conclusions

In this chapter I have explored different aspects of food use, access and exchange, and tried to unpack the mechanisms behind the different dietary patterns outlined. We tried to answer the question on whether commercialisation differences impact on dietary patterns, and how class stratification reflects different dietary diversity and food security. In particular, whether different social relations of production outlined in chapter 6 impact on dietary diversity and food security. In sum, does class explain what people eat and why they eat what they eat? The results show that:

Farmers managers as a whole, although benefiting from more assets, are less dependent on the market for food provision and generally do not buy processed food. That means that there is not a direct relationship between the commercialization of production and commercialisation of consumption. This confirms Poulton's observation that farmers usually keep a share of land for subsistence crop even when returns in the market are high (2006, 2008). Cotton producers although less exposed to market-oriented production, hold good levels of diversified diets. Cotton *farmers* indeed do not grasp the benefits of the price of the commercial crop, but they grasp the benefits attached to it, and this allows them to bypass the market for their food consumption.

This case study therefore suggests that cash-crops, if regulated, are not systematically in competition with food security. Interpreting the relation between cash-crop and nutrition as a binary process can be limitative. Furthermore, commercialisation should be defined within the context-specific organizations in which it is embedded. Therefore the nexus between commercialisation and food consumption depends on more complex forms of production and exchange where non-income factors and the role of state policies need to be unpacked to

understand diets' outcomes. The role of the state, which will be analysed in its macro areas in chapter 9, is reflected here at the micro level and shapes not only the production but also the consumption.

Farm wage workers are less dependent on the market for staple food than *dekhans*, because they receive in-kind wages through land/wheat. Nevertheless, both *dekhans* and farm wage workers depend on borrowing from the community for food provision. Such transactions are not monetised but are still productive and affect rural welfare as well as food consumption. Nonetheless, small variations in income in rural areas might produce different and sharp effects on consumption of food. Thus, diet is a good proxy to identify class differentiation in agrarian change, which are nonetheless context-specific.

Diet is not highly diverse, especially among the poorest strata of *dekhans* and farm wage workers. Cereal, tubers and roots occupy the biggest share of the diet across all the groups. However, in this context we acknowledge that income (consumers' demand) is not the only explanator of such low diversification in food consumption and supply-side factors linked to availability matters as well. In this sense, the lack of consumption of some nutritional elements is indicative of wider lags of commercialisation of consumption and market integration, which arguably is indicative of the very gradual market transition occurring in the country. Moreover, the seasonality of consumption of food groups is present and tackled to conservation practices. However, higher income does not always lead to an improved nutritional outcome, but rather an increase in fat and calories intake with implication for diet-related chronic disease (see Tiffin and Salois, 2012). Here, food preferences are highly mediated by culture and local knowledge which make rural diets transitioning very slowly towards less nutrient content food or westernized food, which has been observed, are not widely consumed. Therefore, the empirical evidences suggest the need to address the mechanisms that link an income increase to a rise in artefacted food consumption.

At a methodological level, our findings and analysis show that dietary diversity is not a proxy for diet quality per se. FANTA and IDDI support only partially the understanding of interplays of food production, distribution and access because do not look at the causal mechanisms behind it, which are context-specific and require a thorough systemic analysis which explain composition and substitution effects within food groups. However, such methodologies still revealed important information with regards to the interplay with food commercialisation and class-based consumptions. It has to be acknowledged the fact that, to assess welfare in a systemic perspective, a broad-based agrarian development analysis should also look at the

parallel issues of health, sanitation and education mentioned in section 3.4. Those aspects, although are not the focus of this research, could be the scope for future and multidisciplinary research.

In conclusion, the system of provision approach used so far has tried to unveil the vertical dimension of consumption, by specifying the chain of activities connecting production to consumption with the commodity as meeting point along the way (Fine, 2013a:220). This analysis has proved that activities are defined by price and available income but also by social norms and values, gender and knowledge. Unpacking consumption patterns is critical to understand how food choices get shaped, and those can only be grasped through a multidisciplinary approach which looks not only at the mechanisms of production but also encompasses an ensemble of individual and social values interacting with economic and political drivers.

In the next chapter I expand further on the nexus among agrarian production, market, and food consumption.

Chapter 8: Unpacking the Uzbek commercialisation–food nexus

8.1 Introduction

So far, I explored the theoretical and methodological foundations to set up the research and proceeded with the analysis of the patterns of agrarian market transitions in the Samarkand region and its impact on food consumption. Chapter 6 discussed the agrarian classes stratification to identify the different productive, commercial, and accumulation patterns. Different production units and their respective outputs are protagonist of different commodification pushes and pulls, through market forces and inputs provision. Thus, we could define this agro-food system as a multiphase and multidimensional *marketisation* process in which food-crops and cash-crops interact in different forms with the market. Chapter 7 investigated how those affect food consumption patterns in relation to food availability, access, use, and exchange. Indeed, the transformation of production system creates intrinsic alteration to the way food, as food crop or cash-crop, is accessed. Those two chapters have unveiled specific forms of commodification of social relations of production and reproduction through complex patterns of food provisioning which inform new forms of exchange and use-value. The growing yet hybrid commoditised agriculture is increasing the polarisation (through stratification) both in (stock)-income and flow of consumption. Now I will try to unpack further the underlying mechanisms behind these processes.

As discussed in section 3.2, an increased interest emerged from the literature in understanding how marketisation shapes food consumption and which are the factors intervening in such social and biological nexus. In particular, at the micro level, whether marketisation would trigger mechanisms of competition and substitution effects of output and labour destinations, and, at the macro level, subdue national production of food. As mentioned in chapter 4 in Uzbekistan, in recent years agri-production shifted towards HVCs and the market increased its role of mediator between food production and consumption. Thus, there is a need to unpack how such market transition and the parallel intensification of division of labour interplay with mechanisms of crop diversification, wealth accumulation and food security at micro and macro level.

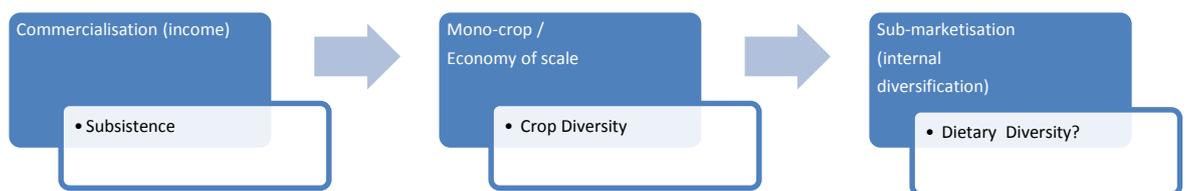
In this chapter, particular attention will be put on the micro level dynamics, leaving the discussion of the macro implications to chapter 9. Section 8.2 will investigate whether: a) An increase in income (wealth) leads to better dietary diversity; b) Marketisation leads to lower crop diversity; c) Crop diversity leads to higher dietary diversity; d) Commercial inputs –

output impact negatively on diet diversity. Section 8.3 discusses the standard ontological definitions and epistemological understanding of the commercialisation-nutrition security nexus. By referring to the hypothesis that in this case-study there is no friction between cash-crops and food-crops, I will discuss the specific nature of commercialisation in Uzbekistan, here also defined as *marketisation*. 8.4 will conclude by discussing how a dichotomic understanding of food and cash-crop does not unveil the complexity of the relations intrinsic to the circulation-use process of those commodities.

8.2 Commercialisation and (diet) diversification

In this section, I am going to discuss the effects of the market on dietary diversity and agrarian production. According to the mainstream perspective, market supply, through price and quantity adjustments, creates automatically its demand, therefore it ensures that the food arrives to the table of the consumers. By contrast, empirical evidence so far show that both supply and demand are not spontaneously created, but are the result of directional forces exercised by different economic and political powers which often act in contradiction between each other and create unbalances in the diets. As widely discussed in the heterodox theory, the conditions of economic affordability and of physical or social access cannot be only explained by market forces (see chapter 3, e.g. Fine, 2016; Sen, 1993). For instance, remote rural areas, having high transportation and marketing costs, do not create spontaneous incentives for the market to be created, especially in absence of consumers' purchasing power. This can reinforce situations of subsistence both of production and consumption. Furthermore, crop prices, if driven by profits, will not reflect the intrinsic use (nutritional) values of the food-crop. Yet, price volatility caused by unstable import flow or supply shocks such as saturation and disruptions will upset food access. Finally, it has to be acknowledged that the role of the state, not only as regulator to prevent and address unintended market failures, but also as market enabler through the provision of investments and public goods, could implement public food policies (Oya, 2007; Poulton et al., 2006). Therefore, it is crucial to identify the determinants of agrarian change within and outside the market. Indeed, as outlined in chapter 4, food security and the maximization of revenues from HVC export are two emblematic objectives of the Uzbek agricultural sector. Their operationalization is linked to agro-ecological sustainability and social reproduction which could enter in contradiction with profit. This research will assess whether the GoU's policies strike a balance between those objectives.

Acknowledging the limitations of the market and its unrealistic equilibrium, we know that different mechanisms of commercialisation and dietary diversity can occur in different contexts. To recall the arguments outlined in chapter 3, a simple *theory of change* is described below to untangle the mechanisms around commercial agrarian production, crop diversity and food consumption. The boxes graphically exemplify the hypothesis and prescriptions identified both in the theoretical and empirical literature. The dark boxes describe a scenario in which commercialisation leads to a reduction of the variety of crops produced, due to economy of scale and the intensification processes typical of capitalistic production. This has its peak in the creation of market segmentations of the same food-commodity which would result, as discussed in chapter 7, in the ‘nutritional dilution’ of food, namely in ‘empty calories’ (Dixon, 2010). The white boxes in the second line instead explain a hypothetical counter scenario in which the persistence of subsistence production guarantees the condition of access to a more diversified set of crops, which do not follow criteria of scale and efficiency for their production and re-production and potentially fulfil better the objective of diet diversity.



This case study offers an opportunity to explore whether the transition, or better said, an expansion of crops sold in the market, is taking place in substitution or in alternative to subsistence goals and whether this shift has particular effects on food consumption. Based on such possible scenarios, in this section I am going to test and discuss this case study through the following hypotheses which were set out in chapter 3.2:

H1: An increase in income (wealth) leads to higher dietary diversity

H2: Marketisation leads to lower crop diversity

H3: Crop diversity leads to higher dietary diversity

H4: Commercial inputs –output impact negatively on diet diversity

8.2.1: H1: An increase in income (wealth) leads to higher dietary diversity: testing the income effect

Linked to the debate which looks at whether commercialisation results in higher income (see section 3.2), one would argue that richer farmers simply eat better. This hypothesis is

supported by some mainstream strands of the theoretical debate, and demonstrated by some empirical evidences outlined in chapter 3.2. A higher income allows consumers to eat more and better food. However this does not diminish, but rather reinforces the importance of understanding the linkages between income and nutritional outcomes at small scale. However, I argue that the answer is slightly more complex. In order to develop this argument, in this section I explore whether a higher asset score is correlated with more diversified diets. As outlined in chapter 5 and 7, individual dietary-diversity index (IDDI), despite its conceptual weaknesses, it provides a reasonable picture of the varieties of food groups consumed by the target population. Also, assets are considered to be good proxy of wealth and accumulation dynamics in context where money and wages are not the main sources of livelihood and transaction. As observable in table 8.1, the quite high correlation between IDDI index and asset index (0.534) would suggest that the wealthiest respondents eat more varied diets.

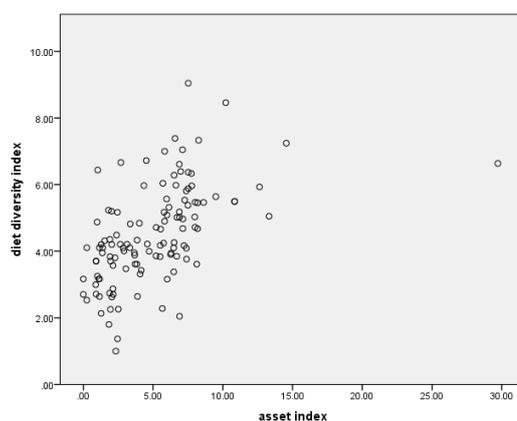
Table 8.1- Correlation between IDDI and Asset index

		IDDI index	Asset index
IDDI index	Pearson Correlation	1	.534**
	Sig. (2-tailed)		.000
	N	120	120
Asset index	Pearson Correlation	.534**	1
	Sig. (2-tailed)	.000	
	N	120	120

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Author's survey data

Figure 8.1- Scatter plot asset and IDDI index

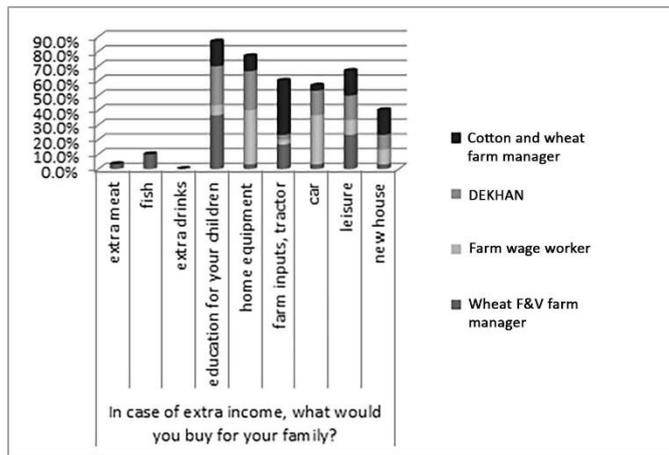


Source: Author's survey data

For instance, figure 8.1, which plots asset index against diet index (PCA), confirms that there is a correlation between the two but there are also outliers. From those results, we can draw two important points. Firstly, about the potential methodological problems linked to the use of the assets index. In fact, the concentrated distribution of the assets index could be explained by the fact that the assets picked do not reflect the differentiation between poor and rich. However, as explained in chapter 5, the asset index has been created through 13 assets out of a biggest set of 30 assets by selecting only those with the highest variance. Therefore, this result would suggest a sharp asymmetry of assets owned across the different types of farmers represented in the survey. Secondly, based on these results, one can argue then that the variety, or better yet, the quality of food consumption might not only depend on wealth, but there are other mechanisms that drive food choice and consumption which go beyond income and that needs to be untangled. As confirmation of the above figures, in this case study it has been observed through both qualitative and quantitative observations that diets, although overall show satisfactory levels of dietary diversity, are very often very monotonous even among the wealthiest respondents. Thus, we cannot assume that the extra income obtained from the sale of commercial crops is going to be used to consume other (extra) nutrient-dense food.

This hypothesis has been counter-tested through a survey question, which asked to farmers would they buy in case of extra-income. Although the question did not specify the amount of extra income, the question listed a closed number of options they could pick, so the choice made did not depend on the hypothetical income availability but rather on their personal desire. Indeed, many farmers have opted for non-food related options such as to invest in farming inputs and investing in education of their children rather than buying more 'nutrient-rich' food such as fish or different varieties of imported fruits or food stuff (figure 8.2) (Girard et al. 2012). This observation suggests how nutrition enters in competition with a set of other needs and multiple preferences can coexist in a situation of budget constraints (ibid).

Figure 8.2 Q: 50 In case of extra income, what would you buy for your family?



Source: Author's survey data

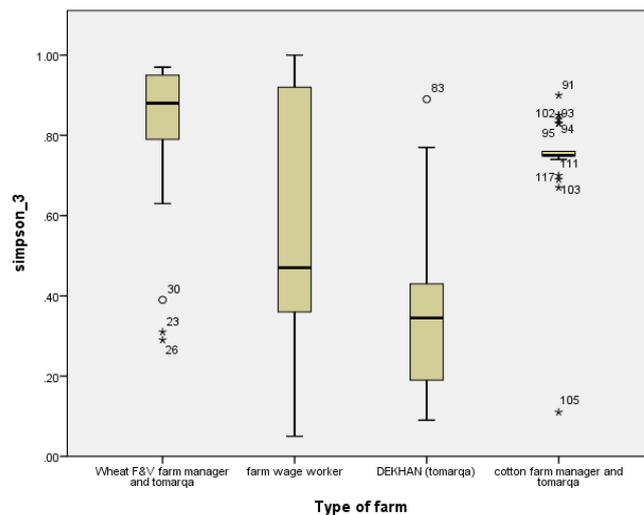
This result proves that mechanisms of supply and demand are dependent on multi-layered factors and income is not the only driver of food choice. Therefore, there is not always a linear relationship between income and food intake. Consumption patterns are subject to food availability on the market, but are also influenced and shaped by personal choices and availability of choices, knowledge, nutritional and social values, customs, and beliefs around certain types of food which contribute to perpetuate certain social practices (Hoddinott and Wiesmann, 2010). Furthermore, although monotonous diets which lack micro and macro nutrients are not desirable, when the food production is not fully commercialised, the food system is not liberalised and social norms make consumers reluctant to dietary change, consumers could be less exposed to imported /processed food, even among higher incomes, thus avoid unhealthy behaviours which can confute the diets transition story where economic growth always lead to unhealthy food. Nonetheless, lack of availability in food market can be a source of diet dis-functionality and it matters especially in case of scarcity of alternatives within poor/cheap products. Those observations invite to untangle other hypothesis to shed light on the multiple and complex links around food consumption and food choice.

8.2.2 H2: Marketisation leads to lower crop diversity

The previous section discussed how in this case study wealth, 'proxied' by the asset index, does not automatically imply a 'better' dietary diversity. Heterogeneous and multidimensional factors count in the creation of a functional food system. As reviewed in section 3.2, a recent body of literature posed interesting questions and investigated whether diversification and specialisation are a trade-off for nutrition (Webb and Block, 2012; Pellegrini and Tasciotti, 2014). In view of such review, which unveiled that in many cases the

intrinsic concentration mechanisms driven by economy of scale and yield-driven objectives lead to a decrease in crop diversification, this section discusses twofold issues. First, how crop diversity differs by farmer types, namely, which type of farmers surveyed among cotton and HVC farm managers, *dekhans*, and wage farm workers, hold the widest spectrum of crops (namely cultivate a higher number of crops). From the survey data it has been developed a Simpson index, whose method is discussed in section 5.5.

Figure 8.3- Simpson index by type of farmer surveyed



Source: Author's survey data

As observable in figure 8.3, *fermer* managers involved in the production of state-crops (cotton and winter wheat), although constrained in what they cultivate on their land due to the official system of public procurement, overall manage to produce a wider range of crops than others (see value in axes 'Simpson_3' (D) in figure 8.3 at 0.9 and 0.78), and this is especially significant in the case of wheat producers which, as explained in chapter 4 and in chapter 6, also produce fruits and vegetables. *Fermer* managers show more positive results than *dekhans* arguably because they simply benefit from larger land size (average land size for *fermer* manager in our case study was 59 hectares for cotton-wheat producers and 32 hectares for wheat-HVC producers as opposed to 0.3 hectares for *dekhans*). Nevertheless, this result would confirm the coexistence of diversification and intensification trends occurring simultaneously with different crops within the same productive unit as result of increased access to land. Indeed, based on qualitative observations gathered during the interviews in fieldwork, farmers cultivating state-crops, namely cotton and wheat, manage to leave some space in the field for food crops, which, on top of the output coming from the household plot, contribute to feed the food needs of the managers and sometimes of the workers, other than to be sold in the market as cash crops in case of surplus. By

contrast, although *dekhans* are not subject to any kind of state procurement restrictions, the small size of the plot, although with high differences, generally does not allow to cultivate many crops and they do not show high levels of crop-diversity, on average (D at 0.46 and 0.38 for farm workers and dekhan respectively).

Second, I assess whether in this case-study the process of marketisation tends to decrease crops diversification. I will explore three kinds of relationship. Table 8.2 shows the crop diversity in relation with the subsidised means of production (input index), Table 8.3 the access to market channels (output index) and table 8.4 the combination of the two (marketisation index).

Table 8-2- Correlation between Crop Diversity and Input index

		Crop Diversity Index	Input index
Crop Diversity Index	Pearson Correlation	1	.523**
	Sig. (2-tailed)		.000
	N	120	120
Input index	Pearson Correlation	.523**	1
	Sig. (2-tailed)	.000	
	N	120	120

** . Correlation is significant at the 0.01 level (2-tailed)

Table 8 3-Correlation between Crop Diversity and Output index

		Crop Diversity Index	Output index
Crop Diversity Index	Pearson Correlation	1	.639**
	Sig. (2-tailed)		.000
	N	120	120
Output index	Pearson Correlation	.639**	1
	Sig. (2-tailed)	.000	
	N	120	120

** . Correlation is significant at the 0.01 level (2-tailed).

Table 8.4- Correlation between Crop Diversity and Marketisation index

		Crop Diversity Index	Marketisation index
Crop Diversity Index	Pearson Correlation	1	.608**
	Sig. (2-tailed)		.000
	N	120	120
Marketisation index	Pearson Correlation	.608**	1
	Sig. (2-tailed)	.000	
	N	120	120

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Author's survey data

From the above results, the proposition that market mechanisms create a tension and reduce crop diversity is disproven in this case-study. Looking for instance at the rising role of HVCs would help unveil certain complexities. HVCs are inserted in the process of commercialisation of outputs because, as observed in chapter 6, those crops are channelled towards the most sophisticated markets available. However, in absolute terms in this case study such commodification can be interpreted as an operation of crop diversification at large scale undertaken and promoted by the government which diverted land from the rotation of cotton-wheat towards fruits and vegetables. Therefore, in this case the commercialisation process is not developing through the substitution of food crops with export-oriented cash-crop driven by profit, but rather through a re-configuration of the agricultural output planned and regulated at the state level. Indeed, winter wheat was introduced in the early 90s to diversify production from the monoculture of cotton imposed during the Soviet Union but most of all, to fulfil the objective of grain self-sufficiency, which will be explored in chapter 9. This result shows the need to expand the analysis to the wider systemic mechanisms and implications of diversification surrounding cash-crops.

8.2.3 H3: Crop diversity leads to higher dietary diversity

As explored in chapter 2, growth-policies in agriculture have often triggered commercialisation processes. Previous results have shown that market integration can play out in different ways since crop production can shift towards diversification or/and intensification. Moreover, depending on the specific regulatory settings, such dynamics affect differently consumption patterns. Indeed, nutritional outcomes observed in the various productive settings are not exclusively dependent on the concentration of the crop but

depend on indirect determinants. In this case study I assessed that emerging forms of capital and labour-intensive horticulture commercialisation are emerging through a re-composition of crops production, which, as showed in the previous section, is correlated to more diversified crop producers. Now I look at how crop-diversity interplays with dietary diversity. In section 3.2 empirical studies suggested that higher crop diversity seems to have higher positive impact on agricultural incomes and nutrition indicators (Von Broun, 1995; Jones et al., 2014). Conversely, others have argued that crop-diversity is detrimental or neutral for food access (Sibhatu et al., 2016). Hence, contradictory evidence and results were provided. In this section I will investigate how crop diversity and dietary diversity interrelate in this case study by testing whether higher levels of crop diversity translate in higher dietary diversity.

Table 8.5- Correlations between Simpson index and IDDS index

		Crop Diversity Index	IDDI index
Crop Diversity Index	Pearson Correlation	1	.366**
	Sig. (2-tailed)		.000
	N	120	120
IDDI index	Pearson Correlation	.366**	1
	Sig. (2-tailed)	.000	
	N	120	120

*. Correlation is significant at the 0.01 level (2-tailed).

Source: Author's survey data

Table 8.5 shows that crop diversity index is positively associated with dietary diversity, confirming one hypothesis in the literature. Nevertheless, when looking at the multiple correlation of the sub-productions (table 8.6), cotton does not correlate significantly and positively with many vegetables and fruits, as opposed to wheat, which instead correlates positively with carrots, onion, fruits and fodder crops as. This result seems to support the proposition that commercialisation process cannot be only explained by economy of scale and land size²⁴, but also by the nature of production. However the results confirm that higher crop diversity triggers positive outcomes in term of food access and thus dietary diversity. This case study proves that the assumption that cash-crops, (which in this case study are

²⁴ The most diversified settings are the wheat- HVC which, on average, have smaller land size than cotton-wheat producers

cotton and partially winter wheat because it cannot be directly consumed as it is destined to state procurement), create a substitution or competition effect with food needs is not always confirmed empirically. Instead, the empirical evidence provided confirms that the consumption outcomes are context specific and depend on the technical, productive, regulatory and institutional configurations, to be explored in chapter 9. Indeed, market and non-market reforms managed by the state policies, but also their intersection with local norms linked to food and power contribute to shape the outcomes of food production and consumption.

Table 8.6- Multiple correlations among different crops from survey data

		Correlations												
		cotton ha	wheat ha	mulberry ha	fodder crops ha	tomato ha	potato ha	cabbage ha	carrot ha	onion ha	fruits ha	pepper ha	cucumber ha	other veg ha
cotton ha	Pearson Correlation	1	.494**	.094	.187	-.220	-.135	-.166	-.086	-.161	-.076	-.081	-.133	.055
	Sig. (2-tailed)		.000	.309	.041	.016	.142	.070	.348	.080	.412	.378	.146	.550
	N	120	120	120	120	120	120	120	120	120	120	120	120	120
wheat ha	Pearson Correlation	.494**	1	.034	.369**	.301**	.184	.296**	.370**	.404**	.468**	.177	-.078	.598**
	Sig. (2-tailed)	.000		.713	.000	.001	.044	.001	.000	.000	.000	.053	.400	.000
	N	120	120	120	120	120	120	120	120	120	120	120	120	120
mulberry ha	Pearson Correlation	.094	.034	1	.045	-.043	-.013	-.036	-.033	-.034	-.040	-.012	-.011	-.025
	Sig. (2-tailed)	.309	.713		.629	.643	.891	.695	.717	.711	.667	.899	.906	.783
	N	120	120	120	120	120	120	120	120	120	120	120	120	120
fodder crops ha	Pearson Correlation	.187	.369**	.045	1	-.025	-.001	-.013	-.006	.043	.235**	-.029	-.063	.342**
	Sig. (2-tailed)	.041	.000	.629		.789	.993	.889	.944	.644	.010	.749	.495	.000
	N	120	120	120	120	120	120	120	120	120	120	120	120	120
tomato ha	Pearson Correlation	-.220	.301**	-.043	-.025	1	.572**	.753**	.750**	.756**	.371**	.431**	.166	.190
	Sig. (2-tailed)	.016	.001	.643	.789		.000	.000	.000	.000	.000	.000	.069	.038
	N	120	120	120	120	120	120	120	120	120	120	120	120	120
potato ha	Pearson Correlation	-.135	.184	-.013	-.001	.572**	1	.361**	.366**	.407**	.089	.384**	.764**	.063
	Sig. (2-tailed)	.142	.044	.891	.993	.000		.000	.000	.000	.333	.000	.000	.494
	N	120	120	120	120	120	120	120	120	120	120	120	120	120
cabbage ha	Pearson Correlation	-.166	.296**	-.036	-.013	.753**	.361**	1	.809**	.653**	.180	.568**	-.047	.113
	Sig. (2-tailed)	.070	.001	.695	.889	.000	.000		.000	.000	.050	.000	.613	.217
	N	120	120	120	120	120	120	120	120	120	120	120	120	120
carrot ha	Pearson Correlation	-.086	.370**	-.033	-.006	.750**	.366**	.809**	1	.778**	.167	.366**	-.074	.165
	Sig. (2-tailed)	.348	.000	.717	.944	.000	.000	.000		.000	.068	.000	.423	.072
	N	120	120	120	120	120	120	120	120	120	120	120	120	120
onion ha	Pearson Correlation	-.161	.404**	-.034	.043	.756**	.407**	.653**	.778**	1	.191	.080	-.068	.160
	Sig. (2-tailed)	.080	.000	.711	.644	.000	.000	.000	.000		.037	.383	.464	.080
	N	120	120	120	120	120	120	120	120	120	120	120	120	120
fruits ha	Pearson Correlation	-.076	.468**	-.040	.235**	.371**	.089	.180	.167	.191	1	.224	-.042	.526**
	Sig. (2-tailed)	.412	.000	.667	.010	.000	.333	.050	.068	.037		.014	.647	.000
	N	120	120	120	120	120	120	120	120	120	120	120	120	120
pepper ha	Pearson Correlation	-.081	.177	-.012	-.029	.431**	.384**	.568**	.366**	.080	.224	1	.297**	.155
	Sig. (2-tailed)	.378	.053	.899	.749	.000	.000	.000	.000	.383	.014		.001	.090
	N	120	120	120	120	120	120	120	120	120	120	120	120	120
cucumber ha	Pearson Correlation	-.133	-.078	-.011	-.063	.166	.764**	-.047	-.074	-.068	-.042	.297**	1	-.031
	Sig. (2-tailed)	.146	.400	.906	.495	.069	.000	.613	.423	.464	.647	.001		.739
	N	120	120	120	120	120	120	120	120	120	120	120	120	120
other veg ha	Pearson Correlation	.055	.598**	-.025	.342**	.190	.063	.113	.165	.160	.526**	.155	-.031	1
	Sig. (2-tailed)	.550	.000	.783	.000	.038	.494	.217	.072	.080	.000	.090	.739	
	N	120	120	120	120	120	120	120	120	120	120	120	120	120

Source: Author's survey data

8.2.4 H4: Commercial inputs –output impact negatively on diet diversity

As reviewed in chapter 2, the empirical evidence outlined in the literature on whether an expansion of cash-crop production affects negatively food security has been mixed. In this section, we are going to test from one more perspective the hypothesis that more market-oriented productions do not worsen dietary diversity. This is first tested through the input index (table 8.7.) and then through the output index (table 8.8). Also, I tested it by merging the two indices together (table 8.9 – marketisation index). As already mentioned in chapter 5 and 6, I remind here that the two indices have been treated separately because means of productions and market channels follow different mechanisms of provision. The combined indices are nonetheless able to show the aggregate results.

Table 8.7-Correlation between Dietary Diversity and Input index

		IDDi index	Input index
IDDi index	Pearson Correlation	1	.423**
	Sig. (2-tailed)		.000
	N	120	120
Input index	Pearson Correlation	.423**	1
	Sig. (2-tailed)	.000	
	N	120	120

** . Correlation is significant at the 0.01 level (2-tailed).

Table 8.8-Correlation between Dietary Diversity and Output index

		IDDi index	Output index
IDDi index	Pearson Correlation	1	.404**
	Sig. (2-tailed)		.000
	N	120	120
Output index	Pearson Correlation	.404**	1
	Sig. (2-tailed)	.000	
	N	120	120

** . Correlation is significant at the 0.01 level (2-tailed).

Table 8.9 - correlation between dietary diversity and marketisation index

		IDDI index	Marketisation index
IDDI index	Pearson Correlation	1	.463**
	Sig. (2-tailed)		.000
	N	120	120
Marketisation index	Pearson Correlation	.463**	1
	Sig. (2-tailed)	.000	
	N	120	120

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Author's survey data

As shown in the tables above, the correlations for inputs and for outputs are both significant and positive. This is even slightly higher in the correlation with output index, which suggests that a higher integration to the market does not always expose farmers to less diversified diets. This result confirms the food security indicators assessed in section 7.3, which show that *farmers* were the less vulnerable to food access. Here is useful to remind that, as explained in section 4.2 and investigated in chapter 6, the inputs of the farmers involved in the cultivation of state-crop farms interviewed, namely those who produced cotton and winter wheat are state subsidised through public provision. As already mentioned, it has been observed how such fertilisers and agro-chemicals were often informally diverted to other food-crop cultivations, or just food crops benefitted from better soil conditions. Thus, besides intended formal positive outcomes, namely the fact that non-commercial access to inputs expands the share of marketed outputs, unintended spill-over effects can occur through the access to such subsidised means of production. This empirical evidence disproves the diametrically opposite thesis which asserts that in a situation of scarcity, market-oriented production would divert the use of inputs at detriment of self-subsistence to obtain higher returns in the market. Instead, it proves that non-market non-profit incentives play a key role in the decision making process of producers.

Since *dekhans* do not have any access to subsidised seeds or fertilisers for their production, the input index could be interpreted as an indicator of state support. This exercise shows that this case-study raises a tension with the typical features used in the literature to describe commercialisation. For instance the public procurement of input indirectly triggers

mechanisms of market transition and commercialisation through informal spill-over effects. Nonetheless, this could also mean that subsidization of inputs correlates positively with dietary diversity for farm producers of state-crops. Indeed, this seems to reinforce the case of Malawi, where results show that fertilisers' schemes have positive effects on nutrition, increased food availability and poverty reduction (Dorward and Chirwa, 2011). Looking at the patterns of HVCs production, it also seems to support Bharadwaj's view that commercialisation processes usually start from the outputs rather than from the means of production (1985). Nonetheless, it also certainly shows that state discipline is exercised through procurement. In conclusion, the results would suggest that, if appropriately supported by apposite state intervention which mediates the mechanisms of market exchange, the process of marketisation (processes of diversification and intensification) in agriculture, marketisation does not automatically result in negative backlashes for diets. Thus, it rather depends on the complementary and supportive tools put in place.

8.3 What does commercialisation mean in this context?

In chapter 6 and 7 I shed light on how production, marketisation processes and nutritional outcomes play out in Uzbekistan. The empirical evidences described so far show new forms of commercialisation exemplified through HVCs. Nonetheless, results show that social relations are complex and diverse and do not always mirror the standard prescriptions of the literature. This reaffirms the need to further reflect on the acknowledgement that commercialisation is context specific, it appears for different reasons, through different mechanisms, and with different outcomes. Once acknowledged the limitations of the normative presumptions on which both theories and empirical evidence rely, in order to unpack further the results of this research and link them back to the theoretical discussion, I now go back to the linkages and differences between the sphere of *subsistence* and *commercial* agriculture outlined at the beginning of the literature review (chapter2). As argued earlier, they often have been epistemologically and ontologically misleading, especially in relations to the definitions of food-crops and cash-crops.

First, it has been proven that the two spheres of production, the *farmers* and the *dekhans*, identified respectively as commercial and subsistence farmers, do not function in isolation or in competition but there are synergies between the two (Dorward et al. 2009; Swinnen and Vandeplass, 2011). This feature is reinforced by the fact that neither of them are purely commercial nor subsistence-driven. The evidence of this case study disproves the dichotomy

of profit versus non-profit and it confirms that are strictly intertwined. Indeed, this case-study disproved the standard prescriptions that describe larger farmers producing cash-crops and small peasantry food-crops with no overlapping contemplated (Fafshamps et al., 2003). Instead, crop *multi-functionalities* should be acknowledged and understood in relation to how it interplay through and between different *modes of production*. It is argued that market forces are filtered first by the state monopsonic and monopolistic power which allows cotton to be reinserted (re-used) within the local 'moral economy' (Scott, 1976), outside capitalism. But also by the fact that such socio-economic systems reinforce the condition for reciprocity and interpersonal responsibility which shape access of food.

As discussed in chapter 4 and further analysed in chapter 6, around the production of cotton there is a system organized around reciprocity, informal labour and sharing which link the *farmers*, the *dekhans* and the state. Cotton is indeed a source of fibres, its seeds are used to produce oil which is used for cooking, making soap and cosmetics. Hulls and meal are used for animal feed and cotton is also a source of cellulose, pressed paper, a material for shelter, fertilizer and fuel. Those secondary uses of cotton serve the needs of the poorest of the rural community, and mark cotton as a 'semi-commodity'. A typical cash-crop such as cotton in this case still maintains a strong 'use-value' and its non-commodity connotation through gifts, informal transfer, and barter etc. Indeed, although cotton as a 'non-food crop' does not fulfil the objective of nutrition, it nevertheless satisfies other subsistence needs and contribute to social reproduction, proving the contradictions and coexistence of profit-driven and non-profit-driven production and exchange (Hawkes and Ruel, 2006; Jones et al., 2014). Similarly, winter wheat is produced outside the motive of profit-maximisation, i.e. the state subsidises and procures it for its use-value as staple food. Nonetheless, it is also exchanged in the market both as a commodity and as 'in kind payment' to workers. Instead, the capitalistic forces of commodification are visible through fruits and vegetables and their increasing commercialisation through monetisation and export markets however, still overlaps with transfers, in kind wage and subsistence needs.

Finally, the idea of 'thin' markets is correct only if formal and static venues are looked however, I show how different *degrees of separation* are in motion and various types of formal and less formal exchanges exist within market competition. This case study shows an overlapping between *food-crops* and *cash-crops* because output and surplus value are produced both for use-value and for exchange-value (see section 6.3). These two *values* are

‘prioritised’ depending on the contingent production and consumption forces. Therefore their dichotomy seems built on a weak empirical basis. I will now investigate the underlining drivers that affected the production-consumption system in the context of this case study: namely how the circuit of production and exchange of crops interacts with food consumption.

8.3.1 The commodification of production for state-farms and dekhans

Based on chapter 6, in this section I discuss how the structure and the social relations of production and exchange of agrarian crops in Uzbekistan differ from other case studies analysed in the literature of commercialisation. On the one hand, I identified the big-scale *farmers* which rely on state-subsidised inputs and are forced to sell to the state. On the other hand the small household *dekhans* which rely on the market for inputs and output sale. Although they represent categories specific of this case-study, nonetheless I believe that they offer an interesting analytical dichotomy that can inspire relevant reflections and inform the debate on the role of support in agrarian production, commercialisation processes, and food consumption.

In chapter 6, when I investigated large-scale intensive production units, I argued that different farmers and crops are subject to different speed and processes of commodification. These are influenced by the preferential access to the means of production enabled by the government through subsidies and public provision of inputs. Cotton and wheat are not definable as typical cash-crops because not privately commercialised. However, the ‘non-commercialisation’ serves political and social objectives. Cotton serves the macroeconomic state objectives of foreign currency revenue for structural transformation. Wheat production is instead crucial (and F&V) for national food self-sufficiency. I will explore these macroeconomic national objectives in chapter 9.

I observe an ongoing increasing commodification of *inputs* and *labour* which proves the existence of processes of transformation in the relationship of production and exchange. This transformation marks the passage from use-value characterised by barter and informality towards exchange-value along the entire cycle of social production which will trigger, through exploitation, capital accumulation. However, as already mentioned, in the perspective of capitalistic production, the existing forms of exchange still practiced within the rural economy are counterproductive for two main reasons (Thirwall, 2011). Firstly, because money speeds up and simplifies transactions of commodities and secondly, because the division of labour

and specialization is slow, productivity is wasted, thus accumulation is halted. In case money is not used as forms of payment, accumulation will take place through assets and immaterial power rather than money forms, and thus productive investments will be hampered (ibid). Thus, it is argued that in the short-term the informal economy acts as a safety-net however, in the long-term will need to converge towards the formal market to foster growth. This scenario is not incompatible with state-driven investments and regulations, necessary to shape directional demand and supply.

A different scenario is observed instead when looking at *outputs*, which have witnessed a more rapid commercial intensification through a differentiation of market channels. Advanced forms of transaction for HVC are pushed by newly formed channels such as processing companies and international markets. Those market's pulls trigger new dynamics of accumulation. Nonetheless, this marketisation also created new winners and losers. For instance, it has increased the vulnerability of farmers who do not have the storage and distributional capacities to avoid waste and losses of HVCs. According to FAO (interview August 2015) as part of the "optimization reform" some farms considered inefficient have merged into big ones or diverted to intensive gardening. In this process, many smaller farmers lost their land and became employees of the main farmer. Other abandoned agriculture, others agreed to arrange a sort of sub-cooperative that needs to refer to the main farmer. Such reforms created further labour surpluses that need to be absorbed by other sectors. This will be discussed in chapter 9.

In sum, local forms of informal labour relations and non-commoditized forms of land access, through practices within gift economy, have prevented the creation of sharp and fast accumulation and inequality between agrarian classes. This shows that different institutional relations impact on the transformation capacity of the agrarian economy at large. State policies have fostered the appearance of new local, regional or international market opportunities for output. However, such commercialisation depends not only on agricultural production, but intersects with horizontal and vertical linkages within the broad economy. For instance, the introduction of new technology, infrastructure, and better transportation networks can facilitate the diversification of food supply and potentially increase access to diversified nutritious-rich food such as for instance horticultural commodities.

By contrast, I observed that *dekhans* have a more limited physical capacity than state-crops farms, within which, nonetheless, the exchange value of their crops, as observed in chapter

6, plays a big role. This kind of production units are widely spread across the global South, commonly referred by the political economy literature as petty producers. Although their production is not purely driven by profit maximization, however, in many cases, the food-crops produced are sold in local food markets. Thus, their own 'commercialisation experience' is realised within the extensive household production. Indeed, Dekhans produce a large amount (estimated at 60% at the national level by UNICEF, 2015) of fruits and vegetables based on family non-specialised labour, low use of inputs and low or zero mechanisation. Dekhans are 'commercialised' through the compulsion of selling low volume, low productivity diversified set of food-crops (Bernstein, 2010). The crop diversification is driven by the 'portfolio diversification' (Fafchamps, 2002) useful both for consumption and commercial purposes [interview with farmer on November/2015]. This commercialisation is neither incentivised by public investments nor by profit drivers, but, from observations, it seems rather a mere necessity in order to increase their source of income, and particularly cash, for their social reproduction.

Although the literature (BIRTHAL et al., 2013) underlines that smallholders face diseconomies of scale and relatively higher costs of production, it has been observed that they engage with the local agrarian markets especially where labour is domestically available. In this sense, the seasonal opportunities provided by state-crop production (especially cotton) can create time-use competition between wage-labour and household food production. Indeed, when I looked at the type of 'surplus' output produced by smallholders in our survey, it differs between those who are and those who are not engaging in agrarian wage relations. In particular, table 8.10 shows that fewer farm wage workers engage in commercial channels for the sale of their food-crop surplus than *dekhans*, (i.e. 20% do not sell anything) and they sell fewer, and less labour-intensive crops such as carrots and potatoes, which have lower weeding requirements, less stringent storage capacity and more flexible harvesting time (FAO).

Table 8.10- Types of output sold to the market by dekhans and farm wage workers interviewed in the survey

	Dekhan (%)	Agr. workers
Potato	53.3	30
Greens	20	0
Grapes/apples	13.3	6.7
Tomato	13.3	13.3
No sell	0%	20
carrot	0	13.3
Corn	0	16.7

Source: Author’s survey data

Instead *dekhans*, and especially those who do not have a member in remunerative employment outside the household such as taxi drivers, teachers etc., tend to produce crops that require higher labour-intensity such as greenhouse, grapes, dark green leafy vegetables (lettuce, dill, spinach). Those types of crops have, on average, higher returns in the market. Those observations suggest that the decisions on which crops to produce are taken based on a bundle of reasons such as profit, labour availability, market prices, subsistence etc. Furthermore, this example confirms that the specific social and organic characteristics of the crops can affect the process of production, commercialisation and consumption (Fine, 1994). Nonetheless, among the poorest strata of farmers who are not involved in wage-labour relationships with state crops farms, the outputs produced can enter in competition with family needs. Those observations also suggest that the dichotomy of use-value and exchange-value is not defined only by the size of the land or by the opportunity for sale but by mere necessity (Kennedy and von Braun, 1994). Furthermore, in case a surplus of food-crop is created and sold, it could happen that, even if it does not increase the vulnerability of consumption, it can still enter in competition with their subsistence needs through quality or quantity (O’Laughlin, 2013; Mahkamov et al., cited in Garenne, 2009; Wiggins et al., 2015). It is indeed a common practice for the dekhans observed and interviewed during fieldwork to sell their ‘best’ products to the market in order to get higher returns, and consequently consume only the left-overs.

As already widely observed (Oya and Pontara, 2015), the engagement in wage relationship could compensate, through the income generated, the time taken off from the production of food crops in the household plot, making the household rely on the market for the acquisition of food. However, from what it has been observed and per the survey data, the purchase of food in the market very often is limited to staple cereal-based food which could suggest that income does not automatically create the necessary conditions to consume nutrient-rich foods, such as for instance when there is a lack of time to purchase food. This observation confirms the results outlined in section 8.2 and confutes the hypothesis argued by Fafshamps et al. (2003) that farms which rely less on subsistence production, are in turn more market oriented. In fact paradoxically, many dekhans interviewed in the survey are totally depended on free market mechanisms for the sale of their surplus production. By consequence, they are much more exposed to prices volatility and vulnerabilities linked to seasonality than the bigger state-farm managers. In conclusion, the lack of resources or of alternative source of subsistence make the food produced within the household enter automatically the sphere of the commodity being its use-value subdued by the exchange-value. These friction and constraints are exacerbated by many factors: the scarcity of land, the physical and economic impediment to access fertilisers, high yields seeds and machineries, the impossibility to implement economies of scale and therefore discount the costs of investments.

8.3.2 Commodification of consumption

When we analysed consumption patterns in chapter 7, I discussed how diet can be a good proxy to identify class differentiation but also how income is not the only determinant affecting diets. Those interacting dynamics are underpinned by four forms of creation and circulation of (agrarian) outputs observed here:

- 1) Production > consumption
- 2) Production > non-market transfer > consumption
- 3) Production > market > consumption
- 4) Labour > wage > market > consumption

Those four forms can coexist and are not mutually exclusive. Chapter 7 and the results outlined in this chapter confirm that the friction between cash-crops and food security is not automatic but rather dependent on external and internal mechanisms of production, distribution and consumption. The external mechanisms are the forces based on and driven

by market competitions, availability and access which shape the agrarian production and consumption system. The internal mechanisms of distribution are those related to the compulsion of social reproduction and social division of labour between subsistence and market production. As result, different patterns of accumulation of resources and inputs shape the access to food.

There is a fine balance within the idea of quality diet. As mentioned in chapter 7, across strata of farmers, although at different levels and with some exceptions, minimum required dietary diversity is met. Farm managers, by accessing the means of production and more land, are able to gain direct access to more and more diverse food. Although benefitting from higher and steadier returns from their outputs and thus able to accumulate more, farm managers do not buy much food in the market. Those results therefore mean that even the higher classes, namely the farm manager involved in HVCs, although have commercialised its output production, still rely on *subsistence of consumption*. Paradoxically, as already mentioned, the lower classes, *dekhans*, are those who lack the access to enough land and rely on the market for food provision. Indeed, farm wage workers seem less dependent on the market for the purchase of staple food than dekhans, because they receive in-kind compensations i.e. land/wheat. This is a crucial insight with many implications for food consumption which could have not been grasped by using only the standards measurements of food security commonly adopted.

In fact the FANTA and DDI are two widely used methods which uncover important differentiations on the access to food, but are nonetheless static snapshots which have left gaps in answering 'how' and 'why' questions. The limitations of the scope of such tools and methodology used to study food consumption have created the need to expand the questionnaire to reach a more comprehensive analysis on the diet transition occurring in the case study. For instance, to address such limitations, complementary questions have unveiled that both dekhans and farm wage workers depend much more than *fermer* managers on the community transfer and informal system of distribution (though credit, borrowing) for food provision. Also, in section 7.3 through the dietary diversity index it has been found that farm wage workers have access to a less nutrient-rich diet. In this sense, it is reasonable to assert that starch and monotonous staple food is not only symptomatic of a poor income, but also of time constraints, which hamper the cultivation of more labour intensive fruits and vegetables. From such empirical evidence we can then acknowledge that often the *taxonomy*

of cash-crops and food-crops needs to be untangled in relation to the modalities of access to the means of production, market distribution, regulations, and thus through the inter-linkages of state interventions in the market.

As observed in chapter 6, the increased opportunity of wage labour towards specialised agrarian production has raised frictions with unpaid labour that families rely on for their own petty commodity production and other social reproduction routine activities (O’Laughlin, 1996, 2013). Although this outcome has not been observed in this case-study, those dynamics can reduce the overall food availability and trigger inflationary effects at the local level. However, jobs opportunities in the *farmers* facilitate the access to food via cash or in-kind payments. We have observed that virtuous dynamics of marketisation can increase income, although not necessarily trigger neither undesirable nor better nutritional outcomes. Indeed, the richest farm managers do not buy non-essential processed food. The access and consumption of ultra-processed food with high fat or sugar content is lagging for two main reasons: first, from the demand side, the commercialisation of consumption is not widespread across all the income levels and diets are still rich of local traditional meals. Secondly, from the supply side, lag in market infrastructure and liberalization did not trigger a ‘diversification’ of food supply, as alternative to self-consumption. Moreover, even fresh raw food is affected by local price volatility and supply fluctuations which creates a further reason for farmers to limit their exposure to market for food provision. These observations invite for a deeper reflection on the belief that export-based agriculture is always in competition with the food security of the producers. In this respect, competition between outputs’ destinations can exist also at local level. However, this scenario opens space to highlight the potential risks that ‘more market’ could determine through other types of food disruptions. As we have observed elsewhere (section 3.3), sophisticated forms of trading would not always lead to a better diet.

8.4 Conclusions

The first part of this chapter expanded the discussion on the causal mechanisms between crop diversity, wealth, and nutrition. This case study offered an opportunity to contribute to this debate with new empirical evidence. In view of the findings, I unpacked the definition and understanding of commercialisation of cash-crop versus food-crop, by addressing the gap within the literature, invited to a more accurate reflection on methodology for the study of

commercialisation in agriculture and food consumption impacts. I tested four assumptions regarding commercialisation and nutrition and found that:

- a) Higher income does not necessarily trigger higher dietary diversity because this depends also on the food availability on the market or food availability on the farm, induced preferences, and expenditure decisions. Indeed, in situations where markets for food, but also labour, inputs of production and credits are not developed, the link between production and consumption is much stronger, and households rely on situation of autarky. Then, the dietary diversity will depend on what and how much is produced by the same household (Muller, 2009). In these cases, it is appropriate to investigate, as in this research the link between production and dietary diversity.
- b) I observed that this case study disproves the thesis that commercialisation always leads to lower crop diversity
- c) Crop diversity has a positive correlation with higher dietary diversity but that is also the result of larger access to means of production, in particular land, which provides more space to meet food consumption needs. However, this link is less strong in the case of cotton producers.
- d) I looked at how access to input subsidies have positive correlation with dietary diversity, but also that marketisation index (which is formed by the combination of Input and Output Indices) is also positively associated with a diversified diet.

Those analyses have proved the inappropriateness of perceiving commercialisation as a homogenous process and proved necessary an inductive analysis that takes into account the segmentation of production to unveil relevant insights for food consumption. The stratification and class relations identified in chapter 6, and the consequent analysis of distribution and consumption underlined the functional and relational trajectories among different farmers, with the market, and the state. For instance, there are different productive and unproductive relations between the rural politico-economic elite, represented by the rich cotton and F&V *farmers* as discussed in chapter 6, and the *dekhans*. This approach expands the literature on patrimonialism (section 4.2) which describes the economic synergies and dependencies that patron-client asymmetries create without assessing them in depth, or beyond their pre-assigned institutional role. This research instead tried to look at how such social relations of production affect the dynamics of capital accumulation and economic transformation in the context of Uzbekistan. As outlined in the whole thesis, and confirmed

through the tested hypothesis, those dynamics are proven to be heterogeneous, very often driven by different actors and for different scopes.

The second part of the chapter looked at the different realities of commercialisation between *dekhans* and *fermer* managers. Empirical evidences confirm heterogeneous processes of commercialisation. Firstly, the circulation of food crops in the Uzbek agrarian economy is characterised by informal and barter exchange and monetised transactions are sometimes less relevant. Subsistence production is not perceived as a desirable alternative to commercial agriculture but as the main mean for social reproduction. Secondly, *dekhans* rely, out of necessity and not for profit incentives, on the commercial (unregulated) market for selling their 'distressed' surplus more than the *farmers*, and thus are more exposed to market systemic risk and vulnerability (of consumption and production) without the basic opportunity of capitalising the risks through market expansion (because of the lack of economy of scale, credit channels, etc..). In this context it is also proved that there is not always a linear relation between marketed surplus and land size (Narain, 1961). Indeed, we have seen that commercialisation in Uzbekistan, meant as integration to the market for output, is identifiable not only in conventional cash-crop monoculture or export-led production, but also within smaller farms.

Thus those elements would suggest the overcoming of unilateral interpretations on commercialisation and encourage a more inductive approach to assess how commercialisation could unfold across the various segments of the agrarian structures. In addition, the heterogeneity of the productive structure and the differentiations of class stratification patterns reinforce the relevance of the contributions of institutionalists which investigate how food crops interact with market forces depending on the institutions they are inserted in (Poulton et al., 2006). Institutions such as the state, through what are called 'market interventions', affect the availability, provision and access to food and other assets, thus they need to be acknowledged as part of the food system.

Also, it is necessary to reconsider the erroneous 'state versus market' dichotomy by showing that the two dimensions are intrinsically interacting in the process of commercialisation. Indeed, as observed in chapter 6 and 7, *commodification* is sponsored and filtered by the state through different regulations and subsidies for the various means of production and consumption (i.e. input –output). As observable in the case of cotton and wheat, market and

state interact differently depending on the type of commodity, their organic characteristics and political objectives. The state uses its centralised position to implement economy of scope where land and means of production are the crucial factors to ensure food security and maximise rent through economy of scale. This case study shows that state-organised institutions and market exchange operate beyond the expansion of capital competition. Nevertheless, it is argued that those filtered marketisation processes actually drive processes of commercialisation. Hence, such regulations are very peculiar and in contrast with the typical market-oriented commercialisation dynamics described elsewhere where inputs have been liberalised, land privatised and output are purely subject to free market.

Therefore, this analysis invites to reflect about the policy rationale and measures behind commercialisation studies. As observed in the literature review, most of the studies emerged on the impact of commercialisation on nutrition focused on a specific point in time and place. Namely, the SSA and South-East Asian experiences in the 1980s-1990s, after the implementation of pro-market and neoliberal policies of cash-crops as result of SAPs. The commercialisation process was embedded in privatization, deregulation, depreciation of exchange rate and trade liberalisation. The academic and policy debate emerged as result of that observations have contaminated the way in which the literature defines the commercialisation process and address its implications nowadays. In particular, those studies interpreted commercialisation processes exclusively within the context of intensification of mono cultures for export. Although this literature has provided relevant theoretical epistemological and empirical insights, it needs to be re-contextualised, updated, and reinterpreted in view of the newly offered empirical contributions. Furthermore, such 'market-focused' trend in the literature discourse has contributed to neglect the state as a central and active economic actor (Oya, 2007; Kay, 2002).

In conclusion, a multiple mix of direct and indirect factors and agencies need to be considered when studying the process of commercialisation. Primary accumulation occurs, "not always coalesced into an integral whole" (Patnaik, 2005b:65). This case study confirms the complexity of the linkages around production and consumption and that market-based agriculture's impact on nutritional outcome depends on the organizations and institutions around them. This work aims at extending spatially and temporally the debate on commercialisation and food, by contextualising the implications of the implosion of the Soviet Union and the paralysis of the "developmentalism" -state interventionism in the rest of the

global South. By looking at one of the post-socialist state in Central Asia, (described by many as authoritarian e.g. Spechler, 2008), we can assess one of the many ways in which commercialisation in agriculture can be operationalized outside the neoliberal policy prescriptions of deregulation and liberalization, and as an example of state-led (development) capitalism. As Joshi et al. correctly stated, “a sound understanding of the patterns of agricultural diversification and its constraints would help in crafting appropriate policies regarding institutional arrangements and creation of adequate infrastructure, which could benefit a large mass of small and marginal holders” (2004:2).

In the final chapter, I will explore which and how macroeconomic policies influenced the Uzbek food regime.

Chapter 9: The Uzbek food regime, state interventions and accumulation from above

9.1 Different perspectives on state-intervention

In chapters 2, 3 and 4 I reviewed the relevant debates in the literature, and identified the theoretical framework. In chapter 5 I introduced the methodology and methods used to support the empirical analysis of this thesis. In chapter 6 I discussed which and how market and state-led mechanisms of inputs and outputs provision and procurement shape agrarian class differentiation. I show that processes of commodification of different crops reveal patterns of accumulation. In chapter 7 I explored if and how such classes correspond to different food consumption patterns and investigated the factors that shape food access and dietary diversity. In chapter 8 I drew some reflections over the definitions, methodologies, and complexities of the nexus between crop production and food consumption by discussing the theoretical and empirical implications. In particular, by looking at the dynamics of commercialisation and how they interplay with food consumption, I argued that, in the context of Uzbekistan, there is not a negative relation between the production of cash-crops and food access. Evidence shows that crop marketisation does not automatically hamper dietary diversity. Instead, non-market mechanisms, norms and agencies play a role in shaping consumption patterns.

However, not only local dynamics but also national and international institutions ultimately define the food system. The food system is here defined as a multi-layer structure connecting production, exchange and consumption which defines the social reproduction through the natural-space and labour-time involved (Bernstein, 2014; Hawkes, 2006). As discussed in section 3.3, the relations between transformation of agriculture, here studied through the dynamics of commercialisation, and food consumption cannot be examined in isolation from the macro-economy. Indeed, a nutritionally balanced food system is a combination of both micro and macro dynamics (Hawkes, 2006; Byres, 2003, 1996; Bharadwaj, 1985). Both micro-level dynamics and macro policy and institutions affect the patterns and outcomes of diet-production systems and so it is necessary to scale up the analysis. As outlined in chapter 4, national food security is embedded in the state mandate, thus it is necessary to look at the source of staple food and its position in national trade (Friedmann and McMichael, 1989).

In section 3.3 I identified competing positions on the policy mechanisms regulating food-crops and cash-crops. A strand of the literature sees the market as the enabler and promoter

of food access and efficient resource allocation as result of growth (WB, 2007). According to this perspective, it is important to avoid market distortions and interventions in agriculture, and limit trade protectionism. However, other authors, coming from a heterodox perspective, have observed that *laissez-faire* policies, withdrawal of state subsidies, and abrupt currency devaluation have often caused macroeconomic and food imbalances (Oya, 2007). Looking at the implications for food consumption, in many contexts trade liberalization created disruption of supply and price volatility of staple food (Akram-Lodhi and Kay, 2012). Indeed, historically, developing countries boosted the production of export driven cash-crops to gain foreign currency at the cost of staple food production. However, substituting domestic food-crops production with cash-crops might create food deficits. Furthermore, it might put pressure on the balance of payment and on national revenue to pay for food imports and other *essential* imports (Kalecki; 1955). Regarding the quality of diets, liberalization policies created also the conditions for MNCs to commercialise fat and sugar-based ultra-processed food in LICs' markets (e.g. Lang, 2010; Gosh, 2010; McMichael, 2009). Therefore, although the spread of western-style diets has been often associated to economic growth (Popkin, 2003) however, without a solid base of domestic nutrient-rich food production, an institutional mechanism of support to local production and regulation, that risks to create negative effects on the economy and on diets (Hawkes, 2015; Webb and Block, 2012). As a response to this concern, recent studies identified in the so called 'nutrition-sensitive' growth, (which involves integrated investments in education, health, and agriculture) a solution for including food security in growth-strategies (Belachew, 2011).

Heterodox literature recognised the potential positive effects of state interventions on agriculture and protection to the infant food sector (Rao, 1989; Oya, 2007; Kay, 2002). As already discussed in chapter 3, the use of protective tariffs can support the development of commercial agriculture by protecting nascent industries from competition (Friedmann and McMichael, 1989). Tariffs are also an important source of revenue to finance industrialisation and, as already discussed, food consumption can also improve through the support to particular food-crops or cash-crops production. In this perspective, it is acknowledged that macroeconomic policies might influence not only the availability and affordability of food, but also enable the condition of employability in the sector. Thus, consumers may find their source of nutrition through income, especially in rural areas.

In sum, the mainstream literature has often focused on income, knowledge, or human capital as crucial factors to analyse food consumption patterns. However, this has obscured the

fundamental relevance of the underlying structural mechanisms of food supply that contributes to explain nutritional outcomes. Furthermore, it is crucial to understand how local forms of agro-capital accumulations in Uzbekistan interplay with the international capital through trade. As argued in section 3.3, the food regime approach offers a useful theoretical framework to analyse the current macro policies shaping the Uzbek food system of supply, to contextualise the “rule-governed structure of production and consumption of food” (McMichael, 2009:5), and to identify the national and global forces expressing the resultant geo-political ordering, forms of accumulation, and vectors of powers’ (McMichael, 2005:272). This will be complemented with the SOP approach to encompass the context-specific economic and social factors that go into the creation and consumption of food (Bayliss et al., 2013:4).

In sum, this chapter sets out a picture of the food regime in Uzbekistan. Along the way, it reflects on the outcomes of state interventions that shaped the provision of food. It is argued that trade and fiscal policies, by affecting prices of agriculture commodities, are crucial tools to stabilise the national food-system. Uzbekistan offers the opportunity to investigate a scenario in which agriculture and food policies are highly affected by state intervention. I discuss how the state here acts as regulator, but also as a promoter of national food self-sufficiency, and as a centralised exporter of cash-crops in a highly subsidised and non-liberalised economy.

Section 9.2 discusses the mechanisms that shape the agro-food production in particular cotton, winter wheat and the emerging HVC sector. Section 9.3 investigates the investments and interventions put in place by the GoU in agriculture to promote such agrarian transformation (crop diversification). Section 9.4 discusses the outcomes of those interventions. Section 9.5 critically assesses the political-economy objectives and socio-economic effects of production and consumption underpinning the Uzbek food regime. Section 9.6 concludes by outlining which are the dynamics of surplus accumulation and how the GoU is tackling the national objectives of economic development and ‘sustainable’ food security.

9.2 The state-led mechanisms on cotton, wheat and HVCs

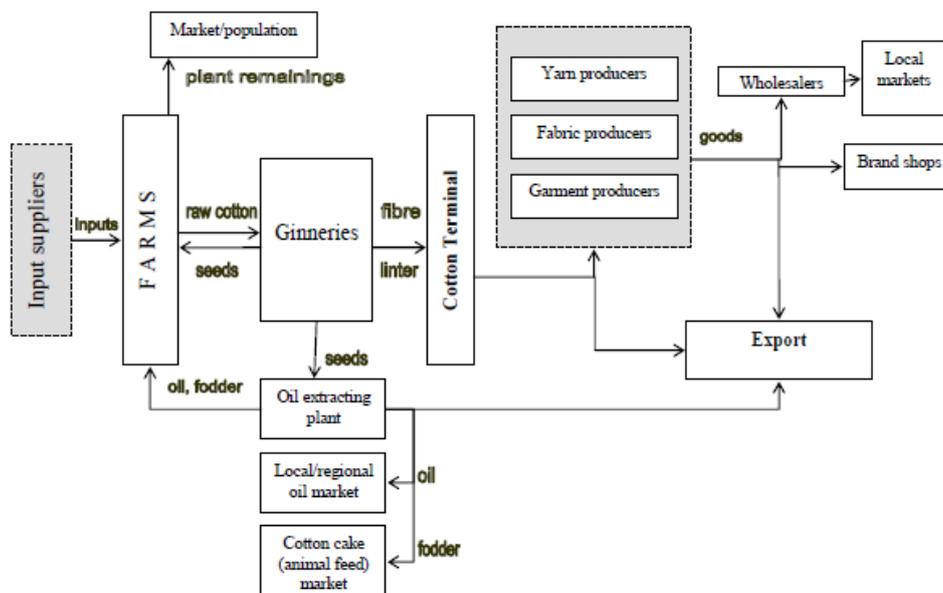
In this section I am going to assess the operationalisation and the mechanisms of support of the main agro-food-commodities explored in this research, namely cotton, wheat, and HVCs.

While outlining such mechanisms, I will also make explicit the spatial and organic specificities, their organizational settings through harvesting methods, storage, transport, and ginning practices of each of these agro-food commodities. These factors entail intrinsic obstacles for capitalistic development and thus illustrate important implications for their profitability (Lenin, 1967; Polanyi, 1944). In other words, understanding the specificities of crops production and distribution allows to assess the social relations of production around them, such as labour and assets ownerships, and their modalities of marketisation and consumption.

9.2.1 Cotton as cash-crop

Cotton (*Gossypium hirsutum*) is one of the most traded non-food commodities in Uzbekistan which has therefore an enormous relevance for consumption and people' welfare. The introduction of cotton in Uzbekistan dates back to the pre-Soviet era. It was introduced from China 2000 years ago. Uzbekistan soon became the cotton basket of the Soviet Union, after the American civil war impeded import of cotton from US to Russia. Thus cotton got commoditised as monoculture at the expenses of grain and foodstuff and Uzbekistan became producer of the 70% of cotton in the Union (Melvin, 2000). After independence in 1991, the cotton sector made up approximately 25% of the Uzbek GDP, including light textile industry (2.1%), 0.5 % for chemical, fertilizers and for petroleum products (non-public data from the government; Muradov and Ilkhamov, 2014). Contrary to many countries in Africa and Asia which liberalised the inputs and output markets and abolished state marketing boards, Uzbek cotton remained state-managed (Figure 9.1 shows the cotton value chain).

Figure 9.1- The Uzbek cotton value chain



Source: Rudenko, 2008

The GoU retains the monopsonic power of the output produced by 66,000 private farms (Gazeta.uz, March 6, 2013). Cotton producers are taxed (being the farm gate price lower than average market price) but also subsidised because as already outlined in chapter 4 and 6, the GoU gives preferential access to means of productions (Rudenko, 2008). Cotton is indeed an input-intensive crop, especially for chemicals²⁵ and water²⁶. Also, being a natural fibre, cotton is susceptible to unforeseeable factors such as weather and pest infestation. Furthermore, chapter 6 shows that cotton is characterised by specific growing practices, seasonality and uneven distribution of labour requirements which can generate labour supply and management problems, contributing to inefficient use of farm machineries (Marx 1867:174-6). Those factors can influence the volatility of prices and supply which has implications for farmers' welfare. Lastly, whereas man-made fabrics can be produced close to spinning mills, natural fibres can grow only in certain places which entail transportation costs. The GoU deals with the logistics and transport from the farm to the cotton terminals, where the cotton is processed and ready to be exported (Figure 9.5). For textile, the fibre quality such as staple length is essential for good yarns and spinning efficiency.

On the 16th of November 2015 I visited a cotton collecting and processing site in the Samarkand province. I interviewed a woman working there as a cleaner who showed me around the factory. She has been working there for 30 years. She explained (in Russian) that the factory employed around 400 people from the village of Metan. They do not work between April and August. The plant has 3 shifts of workers each 24h who on average make between 500.000 and 600.000 sums per month (which equals 0.5 US\$ per hour, or almost 5 dollars per day). Huge trucks coming from the fields were waiting in line to deposit their cotton flowers, waiting to weight their loads and get the documents. The plant hosted very old but functioning ginning machines which clean the flower from leaves and dirt, then divide the seeds and fibres and cotton lint (хлопковое волокно) and with the help of workers packaging bale 200 bales of 230 kg each days. Those were going directly to the Samarkand airport terminal to be exported to China and Korea.

Cotton is overall labor-intensive, and historically has been an important source of subsistence for rural workers. The cottonseeds are mechanically planted but harvesting can follow different methods (Munro, 1988²⁷). Whereas across the world this process is largely mechanised, in Uzbekistan cotton is handpicked through the mobilization of labour from schools, public officials and universities, as discussed in chapter 5. In other studies have been noted that cotton picked by hand is cleaner, as the fibre has fewer neps and lower fibre

²⁵ 151 gr. of chemicals for one pound of processed cotton

²⁶ 53 billion cubic meters of water are consumed annually, 92percent goes to agriculture and the bigger share is linked to cotton.

²⁷ The harvest is done once the plant is defoliated by spraying the plant with chemicals (removal of the leaves-trash) and risks to stain the fibre and is a source of excess moisture. If not defoliated the flower must be removed by hand and human picker must remove the leaves. One machine replaces 50 hand labourers.

content (Lombardozi, 2016). The ILO report on the use of child labour and forced labour in the 2016 cotton harvest showed that child labour was widely reduced (ILO, 2017). Also, it noted that the GOU initiated a mechanization plan (Swinkels et al., 2016). However, international organizations (e.g. Muradov and Ilkhamov, 2014) have been denouncing the GoU for child labour and human right violation²⁸. Although it is recognized the obvious desirability of improving labour conditions in the country, nevertheless these phenomena cannot be analysed in a vacuum, but they have to be contextualised and linked with the mushrooming commodities marketing system based on ethical, environmental and quality standards (E.g. Fair trade' and 'organic') in international trade. Consumption choices are focussing more and more on the production and processing methods rather than on the product (Giavannucci and Reardon, 2000). The product is no longer bought for its intrinsic use-value but rather for its ethical connotation, trust and codes of conduct which are managed and pulled by the privatization and arbitration of the quality criteria (Daviron and Gibbon, 2002). Those strategies enter in clear contradiction with the conventional rule through which markets have been traditionally regulated, namely price competition. Such trends shifted forms of consumption from price-based choice and measurability of the industrial convention through end-user products (Ponte and Gibbon, 2005). 'Consumer protection' is as an additional criteria on which to compete within a value chain, within a regulatory framework which is set by particular political economic groups. Indeed, 'quality grading' and 'classification' of cotton has been traditionally managed and regulated by the US Department of Agriculture. It can be therefore argued that there is evidence to assert that across the globe and regardless the level of openness of the country, the cotton sector is still characterized by strong political interests which influence national/state oligopoly with the US holding the leading role (Daviron and Gibbon, 2002) and make the direct competitors resist the market competition from a subordinated position.

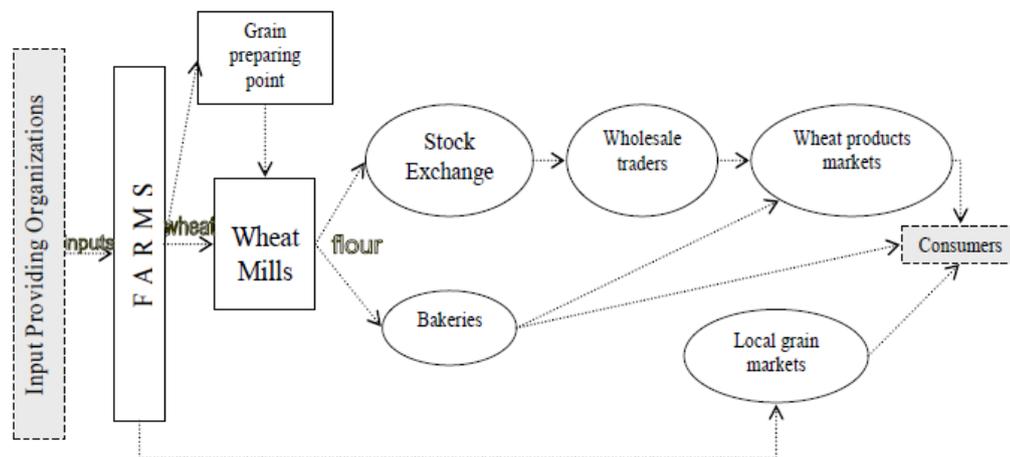
9.2.2 Wheat as bread for self-sufficiency?

Wheat (*Triticum aestivum*) is the third most produced cereal in the world and after rice and maize is the main staple around the world (FAO). Wheat is indeed the core ingredients of the Uzbek diet, appearing together with cotton on the national flag. Wheat is used to make many national meals beside bread (*Non*), noodles (*Norin*, *Lagman*), stuffed dough (*Manti*,

²⁸ This debate is linked to the definitional issues around the category of compulsive labour work. See Morgan and Olson (2007), Rao, Lerche (2007), O'Laughlin (2002), ILO (2005), Banaji (2003), Brass (1999).

Chuchvara, Somsa) desserts (*Halvah*). Wheat has been introduced by the GOU after independence through massive diversion of land and labour (Veldwisch and Spoor, 2008) and it became the second state-managed crop after cotton produced in the country with a volume of production of more than eight million tons (USDA). Quotas, procurement prices and target are set up annually by the GoU. The areas devoted to wheat has been steady for the last 10 years to around 1,430, 000 ha but increased six fold between 1992 and 2005 (FAOSTAT). Winter wheat fits into the agro-ecology of the country. Its arm stands frosts down to -20c during the early growing season. It is harvested at the end of July therefore it is rotated with cotton (Kienzler et al. 2011). It takes between 180 to 250 days to mature (instead the spring wheat takes between 100 and 130 days). “Uzdonmahsulot”²⁹ is the national agency which report to the Ministry of Finance and Ministry of Agriculture involved during the phase of procurement, distribution and storage of the grain chain and provides seeds, credit, transport and quality control. Farmers deliver wheat to state mills, plants and bakeries which produce flour, bread pasta and fodder. Bakeries are directly linked with mills which process wheat flour but can be both state-led and private (see figure 9.2).

Figure 9.2- Value chain of Uzbek wheat



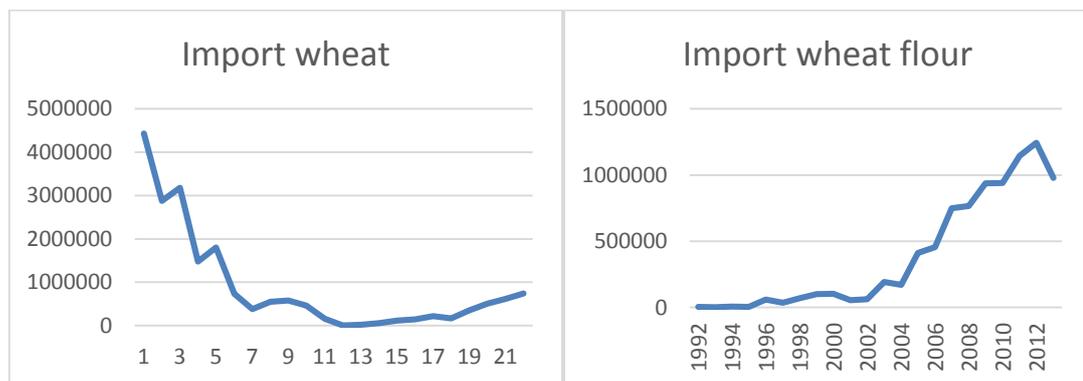
Source: Rudenko, 2008

As observed from the survey (chapter 6) and confirmed by the literature (chapter 5) that wheat is subject to subsidies for fertilizers, machineries, seeds, extension service, water, land and cheap loans (Bobojonov et al, 2013; Djanibekov et al., 2013). In the first year of the production export were banned. In addition, wheat famers benefit from voluntary multiple peril crop insurance regime (Bobojonov et al., 2013).

²⁹ <http://www.uzdon.uz/en/>

This policy, part of the governmental strategy of national grain self-sufficiency and rural development (Declaration of the president, 1992, President speech ‘Food independence important factor of wellbeing, stability, prosperity’, June 6th 2014, FAO), is considered one of the most interventionist agriculture policies undertaken by the GoU since independence and many have raised concerns about its effectiveness. The neoclassical literature has provided many reasons on why such a distortive policy is inappropriate (Djanibekov, 2013). Many describe a situation in which supporting wheat production allocates resources in a sub-optimal and inefficient fashion (Bobojonov et al., 2017). Spoor noted that, because of the low value of wheat and low returns in the market, investments for irrigation and other ecological technology result very expensive (1998). It is argued also that the low prices paid by procurement system create disincentives for producers to increase productivity (Thorbecke, and Morrison, 1989). Also, wheat planting and harvesting are both mechanised and requires less labour than cotton, so it creates surplus of labour in rural areas. Lastly, although there is a constant increase in the overall volume and increasing investments for the processing phase, Rudenko has argued that the efficiency of the wheat sector is low (2008). Furthermore, although wheat import decreased, wheat flour import from Kazakhstan increased consistently and Kazakhstan remains the main provider of unprocessed durum wheat (85% roughly, USDA, Figure 9.3)³⁰.

Figure 9.3- Wheat and flour import 1992- 2012 (in tonnes)



Source: FAOSTAT

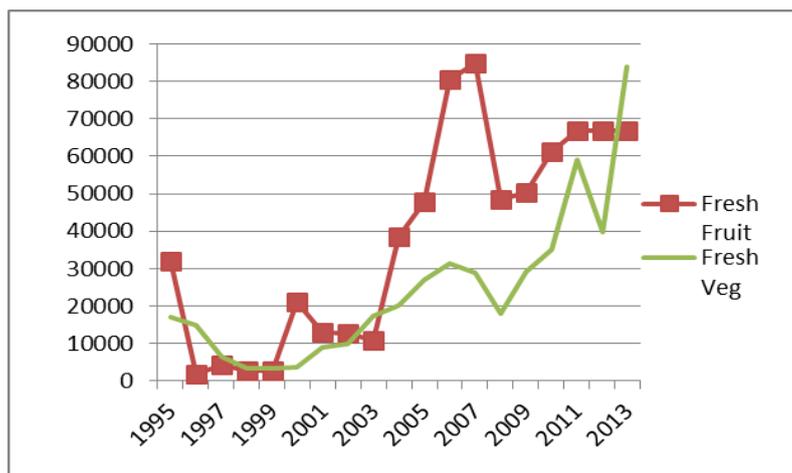
I will discuss later how this holds implications for heterogeneous patterns of consumption.

³⁰ <http://www.indexmundi.com/agriculture/?country=uz&commodity=wheat&graph=ty-imports>

9.2.3 Horticulture as High Value Crops

Until recent years 70% of F&V were produced mainly at the household level. The state has identified in the horticulture sector and agro-processing industry two strategic sectors. As part of a 'Programme of Measures to Expand and Develop the Food Industry' for 2012-2015 HVC intensive gardening became an important share of agricultural output and the volume of production has increased massively (figure 9.4). After 2011, 513 cotton-and-wheat farms covering 240 thousand hectares have been converted into the production of vegetables, melons, peaches, tomatoes, cherries, grapes and other horticultural crops which now account for 35% of export earnings (WB, 2015). Currently, 4.7 million households *Dekhans* cultivate and rely on the horticulture sector as a source of subsistence, along with 21 thousand larger *farmers* and over 40,000 hectares have been established as new orchards through imported seedlings (USAID, 2014).

Figure 9.4-Export quantity (MT) of Fresh Fruits and Vegetables (1995-2013)



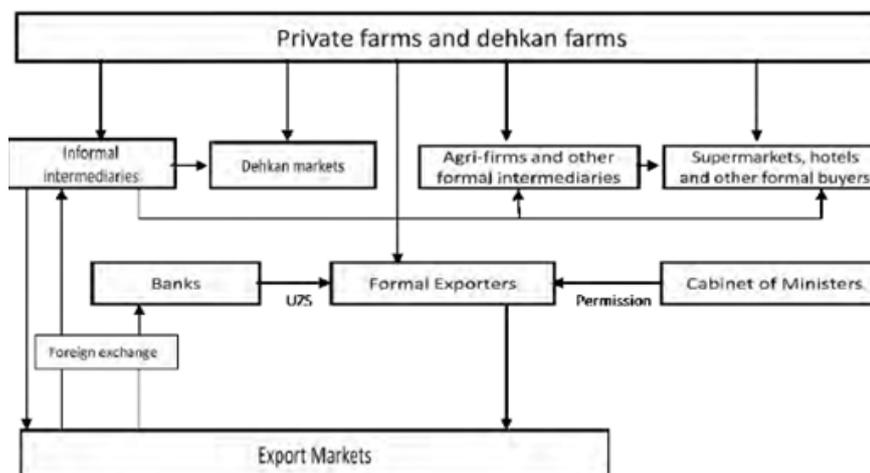
Source: FAOSTAT

HVCs have high yields and between two and four times higher returns than wheat, at the net of operational costs (WB, 2015).

Multiple reasons contribute to explain the cause of such crop diversification. First, the ecological frontier of the country characterised by increasing soil degradation, land desertification and water resources scarcity due to the cotton production, incentivised the government to find strategic alternatives in agriculture. Second, the Uzbek natural comparative advantage in labour-intensive crops and abundance of land per capita. The horticulture sector can absorb the seasonal supply of labour from *dekhans*, which suffer from fragmented sources of income but also diversify the source of income through the

development of processing companies for both unskilled and skilled labour (WB, 2015; Petrick and Djanibekov, 2016). Third, through productive investments, it can drive multiplier effects in rural areas in terms of horizontal linkages on logistics, packaging, certification and trade (UNIDO, 2013; CER, ref). HVCs offer an opportunity to diversify the farming system (WB, 2008:21). Fourth, driven by the increasing foreign demand, Uzbekistan is a potential leader in the regional market of HVC being one of the main producers in the CIS region. Currently it produces more than 19 million tons of HVC annually and around 7% of the total output is exported (WB, 2015). Lastly, it can contribute to enhance food security. As result of a series of interventions which will be discussed in the next session, the commercialisation of agri-food commodities, through the diversification towards HVC, has increased (FAOSTAT, 2011, see figure 9.5 on the HVCs chain).

Figure 9.5 - The Uzbek HVCs organization



Source: WB, 2015

9.3. State-led investments for agrarian transformation

This section draws on the previous section and it focuses on the most recent dynamics of state interventions that contribute to explain the process of crops diversification towards HVCs and the rise of a processing sector which arguably, are contributing to the agrarian transformation. In Uzbekistan, investments in agriculture are increasing, especially in HVCs, hence it is important to understand who funds them and how public and private resources are deployed. Through those policies, agriculture is arguably upgrading from a situation of low-value added towards the 'industrialization of agriculture'.

9.3.1 Innovation and R&D

To process raw commodities and therefore create added-value through technological innovation, financial resources and know-how are necessary. Although the figures on the exact amount of public investments in agriculture R&D are out-dated however, from table 9.1, we can observe a small but steady increase in the funds allocated to research in agriculture. Moreover, in 2013 the GoU increased its commitment to R&D, by raising from 0.3 to 0.41 per cent the GDP expenditure (UNESCO, 2015).

Table 9.1 - Funds spent for R&D in agriculture

. Dynamics of funds spent for agricultural R&D.

Indicators	Years										Relatively to 2001-2011 %	
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010		2011
Budget funds mln, Uzbek soums	674.7	953.0	801.7	916.8	1055.0	1360.4	1805.0	2624.0	5689.7	7606.2	10116.3	1127.3
Compared to total (%)	50.3	38.8	32.0	28.0	18.5	24.5	31.4	63.2	58.5	74.2		-
Funds out of budget mln, Uzbek soums	450.0	848.1	1364.0	1996.4	3884.6	4067.5	3869.0	1445.0	3792.7	2454.8	2944.7	545.5
Compared to total (%)	33.6	34.5	54.5	61.0	68.1	73.4	67.4	34.8	23.9	23.9		-
Foreign investments (grants) mln, Uzbek soums	214.4	654.8	333.9	357.1	757.7	109.3	64.4	80.5	193.7	193.7	204.6	90.3
Compared to total (%)	16.0	26.6	13.3	10.9	13.3	2.0	1.1	1.9	1.9	1.9		-
Total spent funds mln, Uzbek soums	1339.1	2455.9	2499.6	3270.3	5697.3	5537.2	5738.4	4149.5	9740.1	10254.7	13265.6	765.8

Source: Uzbek Agricultural Research and Production Center.

. Share of separate branches of crop growing in the agricultural production and financing of R&D (2011).

Branches of crop production	Share of branches of crop production in gross agricultural output (%)	Allocated funds for the scientific-research works (%)
Grain growing	21.3	32.9
Cotton growing	25.6	53.9
Horticulture and viticulture	16.6	5.1
Vegetables, watermelon, melon, and gourd cultivation and potato growing	36.5	8.1
Total:	100.0	100.0

Source: Calculated according to the data provided by the Uzbek agricultural research and production center.

Source: Musaevich, 2013

The Ministry of Agriculture and Water Resources is the responsible for R&D in Uzbekistan. It has 161 branches across the country and manages 45 research institutes (Musaevich, 2013). The Uzbek research Institute for Vegetables, Melons and Potatoes, and the Uzbek Research Institute of Plant Industry (UzRIPI) are also involved in research to create new seeds breeding and plant varieties to increase yields. Although the resource is still insufficient for the objectives that the GoU has set up for the sector, nevertheless new HVC varieties have been introduced. In addition, new seedlings have been imported to compensate for the lag of local innovation. Although it is acknowledged that there is no automatic and linear relationship between R&D and growth (Mazzucato and Perez, 2015:45), long-term research has been financed through state subsidies and investments, which are linked to specific sector objectives. Backward local linkages with high quality HVCs are a crucial condition for the development of the agro-processing sector. Thus, as outlined in section 6.2.3, neither R&D nor 'leapfrog' solutions can be excluded in a context of budget and capacities constraints.

Here both exogenous namely import of seedling from abroad, and endogenous sources of technological change have been used to enable upgrading.

9.3.2 Public spending and financing sources

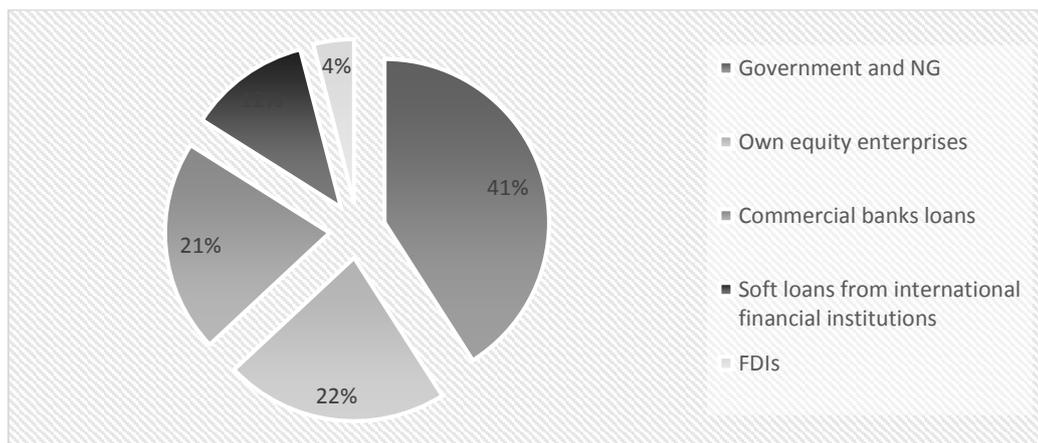
The GoU has engaged with joint-ventures to incentivise technological transfer and the creation of employment in the agro-processing sectors. From available data, the cumulative amount of investments deployed in the agri-business sector amount to 2.3 billion USD (UNCTAD, 2015), i.e. in fruit and vegetable processing, wine production, dairy, oil and mineral water sectors. Since independence, the fruit and vegetable sector has attracted more than 200 joint-ventures involving investors from Germany, Turkey, the Netherlands, Austria, Russia, Switzerland, Italy, Spain and the USA and South Korea. In the field of dairy, cotton seed, soybean, and oil refineries, there is a rapid trend of privatisation. As result, the food and beverage industry represented 9.3% of the industrial output already in 2007, employing almost 90,000 people meaning 14.5% of the total labour force and 27.5% of all industrial enterprises -4,470 agro-firms (FAO, 2014).

While neoclassicals and NIE are optimistic about the contribution of FDIs to the growth of LICs (see section 3.3 e.g. Delpeuch and Leblois, 2014), some authors have emphasised how FDIs can be detrimental for the catching-up of low income countries (Van Waeyenberge and Bayliss, 2017). Indeed, the nature of the contracts can be rigid and biased against the country's interest, particularly when the public objective is to tackle inequality and reach inclusive growth (Van Waeyenberge and Bayliss, 2017). The GoU still owns significant share of prominent firms and sets up specific mechanisms to avoid risks of captive investments practices. Indeed, investors benefit from specific tax and customs exemptions and other incentives if they meet certain conditions: the fund of a company must be not less than USD 150,000; one of the participants must be the foreign legal entity; the share of foreign investments makes not less than 30% of the company capital; the enterprise earns over 60% of its income from the sale of the goods or services it produces or provides. In state registration, joint ventures must pay a registration fee equal to five times the minimum salary plus USD 500.11. There are multiple legal frameworks in place to attract FDIs and incentivise HVC upgrading: allowance of custom duties on import of special ingredients, technological equipment, component, and spare parts, (examples are fermentation, storage, grading machines, tanks, refrigerators) to the equipment used in the processing of vegetables and grapes which are not produced domestically (presidential decrees № УП-3860, dated 14.03.2007, № UP-4354, dated 24.08.2011). To encourage the timely replacement of fully-

depreciated equipment, a charge of 0.25% of the equipment’s historical value is collected from legal entities (except micro and small enterprises) for the continued use of such equipment, but revenue from the sale/disposal of fully-depreciated equipment is exempt from CIT.

Foreign companies producing agricultural products are exempted from asset tax (PwC report, 2012) and have protection against expropriation (USDA, 2014). Those arrangements are negotiated on a case by case basis and implemented through state regulations (i.e. Decree № 105 dated 7 April 2011). Furthermore, in accordance with the new tax code, the tax burden on companies was eased by lowering the social tax and the corporate income tax to 10%. The corporate tax rate is 9%, although a reduction is available if export sales exceed 15%, thus based on a performance based criteria. Moreover at least 50% of the income generated must be reinvested in the further development of the company (Deloitte, 2015).

Figure 9.6 - Structure of Investments into agriculture by source of funding 2009-2013 (%)



Source: UZstat

However, not only private FDIs but also International Financial Institutions such as the IFC-WB group have been increasingly involved in financing the Uzbek agro-industry. Through their Global Trade finance program, the portfolio of local commercial banks has been expanded to issue agro-loans to agro-firms. Moreover, IFC invested 120 million USD to support 31 private sector projects in the agribusiness and food sector, and it also provided advisory role. Although those loans have contributed to generate new private investment, it is nevertheless recognised that the government can borrow at a much lower interest’s rate, and indeed it still remains the major funding source for agro investments, as observed in Figure 9.6. For instance the GoU plan to invest 75 million Euro on infrastructure and storage facilities construction and modernization on baking yeast and iodised salt (FAO, 2014).

9.3.3 Mission agency activities in HVCs

As mentioned in chapter 3, the development of agro-processing industry can play an important role in the economy. It might increase labour demand and create forward and backward linkages across sectors (Mogues et al., 2015). This section discusses the state-driven interventions in the agro-food processing sector.

HVCs are ‘time-sensitive’ commodities which entail constraints for their distribution and access. In this context, roads and storages are indispensable to create efficient linkages both backward, for input provision, and forward for their commercialisation. The overall capacity of the country’s 1.3 thousand storage facilities is currently sufficient for 975 thousand tons of products. This includes a cold storage capacity of 502 thousand tons³¹. However, in order to reduce waste and preserve the freshness of the products, the current level of storage is still unsatisfactory. Indeed, the governmental plan is to reach 5 million of storage facilities by 2030 (Gov.uz). Nevertheless, according to the Global Cold Chain Alliance, Uzbekistan has reached the top 20 countries for cold storage capacity (0.3 cubic meters of refrigerators warehouse space) thanks to the collaboration with USAID projects valued 14 million dollars.

Such investments are coordinated under the umbrella of *Uzagroexport*, a joint-stock company and governmental agency founded in 2016 under presidential initiative. The model has been copied by similar agencies, which act as export marketing boards or industrial planner in others latecomers’ countries (Lee et al., 2014; Mazzucato and Perez, 2015). The agency guarantees a stable supply through the diffusion of forecast tools. It invests in refrigerators, warehouses on harvest areas, storage, sorting and grading machineries of fresh products. It coordinates with enterprises the supply of packaging material, transport and shipment. It also hosts an ‘Export Promotion Bureau’ which deals with quality management, certifications and marketing to expand the export potential of the sector. For instance, it has established trading houses and representation offices in Russia and Kazakhstan, and the plan is to open similar malls in India, Germany, UAE, Belarus, Poland, Latvia and East Asia. The GoU is therefore actively engaged through such agency in the sector’s marketisation. Also, in accordance with the presidential resolution on ‘measures to organize and hold the international fruit and vegetable fair’ in June 2016, it organized an international fair in collaboration with the ministries of foreign economic relations, investments and trade,

³¹ The first controlled atmosphere / ultra-low oxygen storage (CA/ULO) cell in Central Asia was built in Margilan, in 2007 (FAO, 2014)

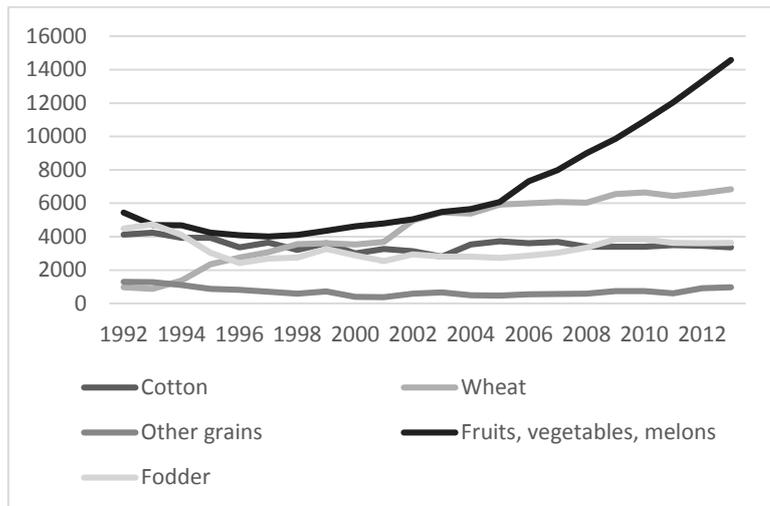
agriculture and water management, *Uzbekoziqovqatholding*, a foodstuff holding company and *Uzbekoziqovqatzahira*, an association for storing and harvesting fruits.

Most importantly, *Uzagroexport* has also dealt with the export of fresh and processed HVCs under a peculiar framework. In 2016 the GoU created a centralized export system to monitor the trade flow of F&Vs and to balance the food supply and prices in the domestic market. Through the resolution 238, export contracts were controlled and registered through the Ministry of International Relations, which made sure that price and payment methods (100% advance) were respected and that 25% of the hard currency was converted in UZB Soum. Producers received 25% of the revenue gained from their export in local currency because the GoU converted this share to retain hard currency. Such commissions' fee, together with the lack of insurance, corresponded to a loss for the farmers because of the issue of convertibility of the UZB soum, arguably it created barriers to business and disincentive investment in the sector (CER, 2017). This regulation has been lifted through a presidential decree in September 2, 2017.

9.4 Data trends in the Uzbek agri-food regime

As introduced in section 4.1, the state-led structural transformation operationalised through the interventions outlined so far, has shaped the agricultural sector. The re-organization of the agrarian production influenced the patterns of agro-commodification and the linkages with food provision. Starting from 2005, the aggregate volume of agricultural products shows a diversification towards HVCs commodities, with a decline of land devoted to cotton (non-food cash-crop) and fodder crops (Figure 9.7; FAO, 2014).

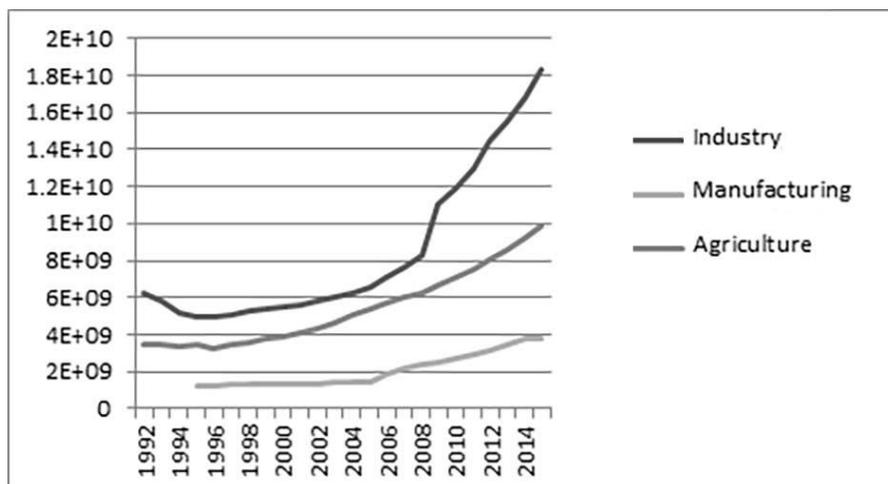
Figure 9.7 - Aggregate volume of agricultural production – production index number 1992-2012



Source: FAOSTAT

The value of production in the overall agricultural sector – figure 9.8- increased as result of the expansion of the livestock and HVCs production. The five top agricultural commodities produced in terms of values in the country have been beef, cotton lint, cow milk, tomatoes, grapes, and wheat (FAO, 2014). Throughout such reforms, since 1996 the national food crop production has grown more than the population however, according to FAO, Uzbekistan is still a net food importer except in fruits and vegetables. Those imports are identified in sugar, oil, poultry, and high-value grocery products.

Figure 9.8: Value added by sector (constant 2010 US\$)



Source: The World Bank

During my fieldwork, I have conducted some semi-structured interviews with agribusiness companies and stakeholder interviews to get a more detailed picture of such realities in the Samarkand region. I report a summary of three interviews here:

In August and in November 2015 I visited one of the biggest processing company for fruits and vegetables in the region, AGROMIR. The factory is located in the periphery of Samarkand, in the Suikuduk district. The factory employees 600 people in the summer and 300 hundred in winter. Women are 80% of the work force and work in the preparation phase (cleaning, filling, dealing with raw material), while men work mostly at monitoring the machineries, transport and logistics and get higher wages. The average wage is 30.000 sums per day for 12 hours shifts 24h/7. The main products they process are pickled canned vegetables and marinated preparations, apples, apricots, pomegranate, cheery and other locally available fruits contracted from the Samarkand region, Ferghana valley, Surkhandarya. They also have their input production through vertical integration. The amount of processed agricultural products raised from 21 to 31 million tons between 2010 and 2013 with revenue that reached 88 billion sums in 2013 and net profit that increased 10 times. Export also increased from 2 million USD\$ to 7 million in 2013. The production cycle follows the seasonal availability of the crops, however the massive storage capacity allows them to redistribute products in the market evenly, and to keep a stable supply on the supermarket shelves over the year. They are able to produce 6 million jars of pickles/conserves and 42 million of fruits juice bricks annually. There is an investment in machineries of around 40 million USD\$ packaging in Tetrapack, fermentation, and fridge storage at 10 degree. The provision of raw F&V is stipulated through fixed prices every year through a three bodies contract where the local governments (hokimiat) coordinates, regulates between the contractors. The workers, who passed from 233 in 2010 to 519 in 2013, have access to a canteen where to consume warm meals for lunch breaks.

On the 25th of August 2015 I visited another company, OXALIK, which is a consortium³² of 500 ha part of Sharq (a state private joint venture) where I observed irrigation methods, labour structure on a varieties of fruits of their intensive gardens of plums, apples, and peaches. The point of contact was a former student of the Samarkand Agrarian University who now works as a chemist for the company. In the car who brought me to the fields there was a leaflet of Monsanto Round up. When asked about the provision of fertilizers, he replied that this kind of firms buy foreign and private fertilizers and herbicides (such as Syngenta, Bayer) etc. (differently from cotton producers who receive chemicals through public procurement). They employ four permanent workers every hectares in the summer plus additional four on call when they need fruit pickers. The best part of the harvest is sold to Russia at 1 dollar per box otherwise they sell it locally (peaches). With the worst parts they do concentrates or jams. After the winter pruning, there is no work that is why most of the jobs are seasonal. In the plant they use a grading machine produced in Italy by Unitech, but when the harvest is less, they hire woman unskilled labour because is cheaper than the electricity costs to activate the machine. They are paid per day according to the number of boxes they fill. Each box is 1000 sums so they can gain up to 100,000 sums per day, depending on their speed. This big consortium of farmers buys new plants (small trees) from Ukraine, Greece, and other European countries. He explained that the first year the tree produces 4 ton, the second year 8 tons,

³² A consortium is a formal business corporation whose members are for-profit business firms from various industries and geographic regions. Suppliers do not pay fees to participate, and there is no interaction between competitors (FAO)

third year 15 tons, fourth year 20-25 tons (yields). They use drip irrigation (propylene tubes), which is an indicator of expensive investments, which has to be replaced every two years.

On the 24th of November 2015 I have visited Owrinka, a public wine company founded in 1868 in the city center of Samarkand. I was not allowed to see the machineries which according to the interviewee, the administrator of the firm, come from Italy (Tafari). The company produces wine, vodka, cognac, and alcoholic balsam. They do not export and their output is 1 million liters of wine per year. From what I have tasted, the quality of the wine is low. They import alcohol from Russia (98 Ruble per liter) but they don't pay duty. They employ 205 workers. 30 are spread out across the production phases of wine, 25 are employed into the packaging and logistics and 10 in the production of cognac. They bought 7 tons of grapes in 2015 from farmers in Samarkand. The stipulation of the contracts is also organized at the hokimiat level through fixed price annual contracts (white is bought at 500 sum/kg and red at 750/kg).

According to recent studies and empirical evidence, crucial constraints persist to ensure the long-lasting success of the sector. Infrastructures are insufficient, although fundamental to enhance commercial access and distribution. For instance, post-harvest losses and logistical barriers have been identified in the tomato and apple supply chains (USDA, 2014) because of the lack of storage facilities, and the high transport costs observed in many districts (Hasanov, 2016; CER, 2017; USDA, 2014). Furthermore, high energy costs prevent the full capacity utilisation of the technology in place in the sector, thus creating inefficiency. Also, more credit is needed to stimulate a private sector that could absorb more rural labour and eventually increase relative wages. These factors contributed to the fluctuation of HVCs prices and supply. Furthermore, procedures for sanitary and hygiene standards are not standardised and sufficiently widespread, especially in the most remote areas, thus creating barriers to trade.

Based on the information gathered from the unstructured interviews, foreign businesses face transaction costs related to profit repatriation linked to the issue of currency convertibility and excessively complicated bureaucracy. Such frictions in the business environment arguable discourage foreign private investments. Indeed, in the HVC sector, many have argued that both public and private investment are still too small and too slow to grow (Hasanov, 2016). Thus, based on these considerations, it could be argued that financing technology and innovation is not enough, and broader complementary policies focussing on institutional capacity have to come into play in order to make upgrading effective and sustainable in the long-run. Considering that the reconfiguration of production requires institutionally coordinated actions to mainstream the capacities which allow technology to

be used and diffused, in the next section I assess whether the state capacity is in place to enable these outcomes.

9.5. Evaluations on agrarian transformation and implications for food consumption

As outlined in chapter 3.3 and at the beginning of this chapter, many have argued in favour of a liberalization, eliminations of state interventions and removal of subsidies to incentivise free-competition and increase yields (Schiff, M. and Valdes, A., 1998). However, it is argued that these 'distortions' have contributed to foster the transformation of the Uzbek agrarian structure. Indeed, fiscal policies such as import duties, subsidies, and incentives can facilitate added value products' terms of trade both directly and indirectly (Rao, 1989; Kay, 2001) and arguably shift the process of structural transformation. Trade policies indeed play a relevant role in shaping the availability, prices and access to different food products, improve food domestic production and shape food consumption patterns.

Looking for instance at *cotton*, this state-managed production setting has enabled economies of scale for inputs and outputs. It has also avoided that the cotton supply would pass from a situation of stable prices for inputs and outputs and harmonized quality standards, to an extremely fragmented market-based structure characterized by the erosion of coordination at the horizontal level, exposed to international prices fluctuating in financial markets, and international private traders acquiring control positions in the domestic market (e.g. Daviron and Gibbon 2002). As result, Uzbekistan is currently the world's fifth largest exporter and sixth largest producer in the world (WB, 2014). It exports approximately one million tons of cotton fibers annually which correspond to 1 Billion USD\$, which, depending on international prices, is roughly 11% of total export earnings. Together with export of minerals and energy, it is an important source of foreign currency, necessary to feed the balance of payment. Thus, the surplus grasped by the GoU through the centralised cotton export, in conjunction with import protection has contributed to accumulate the necessary foreign currency resources to finance inter-sectorial or sub-sectorial economic investment, contribute to the creation of employment, and long-term growth (WB, 2008; Timmer, 1988; Kay, 2002). Beside its macroeconomic role, cotton plays an important role for the rural livelihood. We have seen in chapter 5 and 7 that cotton is destined to multiple uses. This system has allowed farmers and peasants to access such multiple use-values through the formal and informal rural economy having therefore a crucial role in the rural livelihood and welfare in Uzbekistan.

Assessing the distortions on *wheat*, it can be argued that subsidies in wheat production have been fundamental to fulfil the objective of food security. The support to domestic wheat supply decreased substantially the dependency from wheat import, subsidised the value chain of bread through state mills and subsidies to farmers. Furthermore, other than supporting indirectly farmers' income and ensuring a stable access to inputs, subsidised grain production can relieve pressure on wage inflation and thus indirectly subsidise urban and industrial production (Lewis, 1954).

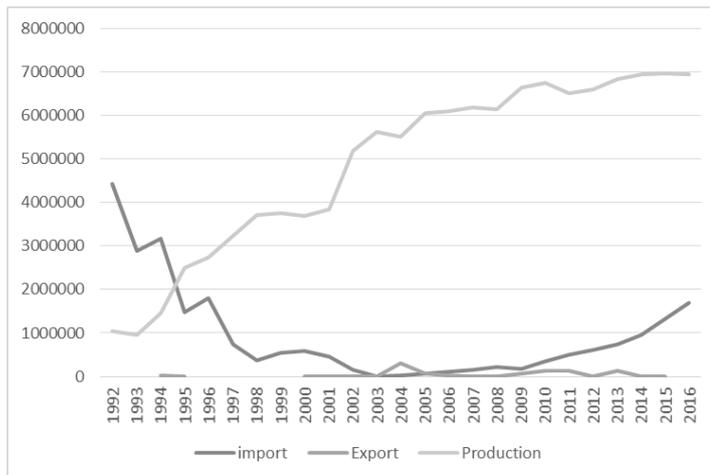
Some authors have noted that Uzbekistan imports higher quality Kazakh wheat to satisfy the rising demand of the urban middle class (Lombardozi and Djanibekov, 2017). Others argued that import is necessary because half of the domestic production is directed to livestock feed instead of food (Rudenko, 2008). Based on bazars and retail prices recorded during fieldwork (August -December 2015), imported Kazakh flour was sold in 50 kg bags at around 100.000-110.000 sums, 1/3 more than Uzbek flour. Retail prices also varies from 3100 sums for one kg of Kazakh flour to 2600 for Uzbek flour. The Uzbek wheat is mostly used (USDA, 2014, over 95%) to bake 'subsidised' social 'brick' bread which costs around 750 sums, almost half the price of other types of bread (Bazar in Samarkand, November 2015). So, it is observable a dichotomy in consumption patterns based on consumer preferences but also translated in prices, so income (see debate in chapter 3.2; Hawkes, 2006; Popkin, 2003). Such food choices based on income and quality interplay within two segments of the same nutritional component (i.e. 'high' quality and 'low' quality wheat). This raises important implications for the study on nutrition, in terms of both methodological and policy objectives. About the policy implications, it is important to underline that, in a context of economic and possibly diet transition, from one hand the GoU has to satisfy the basic needs of the poor by guaranteeing consumption of subsidised bread and wheat-based food, on the other hand we assist to the rapid formation of an urban class which is shifting its consumption behaviours and preferences towards more expensive imported ingredients of, arguably, higher quality (Popkin, 2005; Hawkes, 2006). Thus this example confirms the thesis that even if market forces are highly mediated, capital accumulation and process of growth within a capitalist system polarise diet patterns.

Therefore, there are many political (i.e. non-economic) reasons why '*wheat-sovereignty*' policy has been adopted by many transition economies, including Uzbekistan, in particular after the 2008 food crisis, and after Ukraine and the Russian Federation banned their export. '*wheat-sovereignty*' contrasted supply shortage, reduced import dependency and price

spikes domestically (Bobojonov et al, 2015; Kotz and Hall, 2004). In reality, even heterodox economists warned about the risk of public support to food crops: Chang noted that minimum prices or subsidies imply a fiscal burden for the state, and can disincentive production diversification (2009:505). Nevertheless, Chang adds that, if rightly designed, distortions in agricultural policies can contribute to stabilise prices and production (2009), support farmers' income, and increase the supply of basic wage goods (Ellman, 2014). In fact, as already argued, the state procurement and the system of subsidises helped to keep staple food grain prices and relatively accessible, and, under a strategy of *grain self-sufficiency*, tried to decrease the exposure to international prices and supply volatility, such as the 2008 crisis, thus reducing the exposure to food insecurity, possibly contributing also at diminishing inflationary pressure (Kalecki, 1955). Lastly, being such a politically and nutrition-sensitive sector, such highly interventionist policy avoids that private business get involved through potential speculation in wheat storage, milling, transportation and distribution. Dixon argues that the crisis of nutrition is the result of a dialectic between the state, agribusiness, firms and consumers (2010). The often called 'cheap bread' policy represents a 'pro-poor' state policy that has important implications to tackle the risks of national food insecurity and provide a buffer from market risks.

Furthermore, the hypothesis of low productivity is rejected. *Fermers* (and recently also *dekhans*) have the incentives to produce more because, once they have satisfied their procurement obligations to the state mills, they can sell the remaining harvest to the private market for higher prices (from fieldwork results, more than 90% of wheat producers declared to sell up to 50% of the output to the local bazar for 800-1200 sums per tons or to use it as in kind payment for workers). According to official and WB data, the average wheat yields passed from 3.8 tons per hectare to 4.8 in 2013 reaching almost 7 tons per hectare in 2016 suggesting a steady productivity improvement, thus disproving the neoclassical prescriptions which see state intervention as a barrier to productivity and efficiency (Fig 9.9). Not least, it is argued that diverting to different crops would entail a loss of growing practices, and a destabilization of the technological, organizational institutions organised around the wheat-cotton binary production. Stable 'lock-in' mechanisms ensure that stable patterns linked to timing and crop rotations are kept.

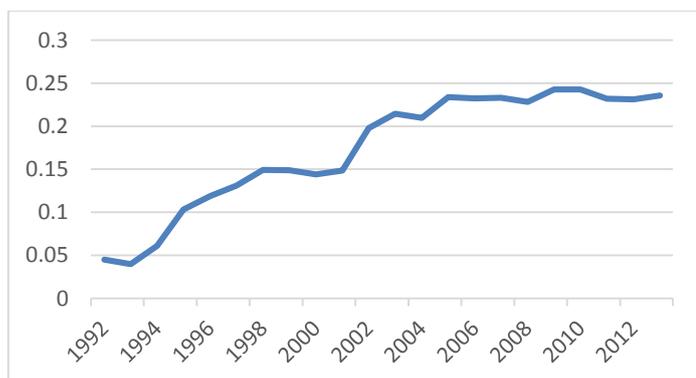
Figure 9.9 - Wheat production, export and import (in tonnes)



Source: FAOSTAT

Lastly, the Uzbek population passed from 21 million in 1992 to 30 million in 2015 indicating a high population pressure. That means that the domestic demand for food has increased by one third over the last ten years. If we look at wheat production per capita has increased from 0.04 to 0.23 (Figure 9.10). Far from assuming that this increase in supply will be equally distributed across levels of income and will be positively transmitted at the micro level, fieldwork observations and survey results (see chapter 7) suggest that bread is consumed by a wide range of the survey respondents.

Figure 9.10- Wheat production per capita (Million tonnes)



Source: FAOSTAT

In conclusion, although in Uzbekistan subsidies come attached to a ‘forced’ production directed to public procurement, this policy responds to two complementary strategic objectives, mainly to reduce the use of foreign currency for food import and to meet the national demand for wheat, especially in poor remote rural areas.

When instead I look at the transformation happening to the rest of *food*-commodities, it has to be noted that in Uzbekistan food imports are subject to excise taxes, acting as tariff.

Table 9.2- Excise taxes on food imports

Fresh fruits	100.0
Juice	70.0 (not less than 1 usd per litre pwc data).
Fresh meat	30.0
Frozen meat	70.0
Cheese	70.0
Sausage	50.0
Sugar	10.0
Wheat	10.0
Oil	20.0

Source: Ganiev et al. 2012

Table 9.2 shows that different fiscal pressures are assigned to different items through those tariffs. In particular, food imports that compete directly with strategic local production, e.g. HVCs and dairy products, are more taxed. Instead, the government has facilitated, through lower tariff, the import of ingredients which are not produced in the country but are used in the agro-food processing industry such as concentrated juice (i.e. pineapples, oranges). Thus, it can be argued that the food import is strategically selected and the GoU protects the development of the national food industry.

Furthermore, the GoU has set up juridico-institutional reforms to attract FDIs but it keeps, through conditionality, a local stake in the sector. This sort of ‘greenfield’ investments allowed the development of processing sites where technology and innovation were scarce and enhanced the conditions for building a local technological base. Furthermore, arguably these settings have boosted the revenue from (and access to) new export markets. Indeed, those partnerships play a significant role in expanding access to international markets and strengthen brand strategies for product segmentation which would allow also local firms to pass the test of international certification for quality control in sanitary, hygienic, inventory and storage capacity.

Coca-Cola and Nestle³³ are two examples of MNCs investing in Uzbekistan. Coca-Cola revenue in Uzbekistan has grown ten times over the last 10 years. The representative of the company in the country confirmed that the “ready to drink” beverage consumption is still quite low in the country, (just 16 litre per-capita). This is probably due, as already mentioned in chapter 6, to the connotation of cold drinks in the norms of consumption (Interview with WHO representative, August 2015). However, to expand their profit, the company has identified in the booming young population their target consumers. Coca-Cola, as part of its marketing operation, has financed irrigation system improvement for 2,100 Ha of land, and improved safe drinking water for 12,000 people. Also, Nestle started its production in Uzbekistan in 2012 with two factories; it employs more than 700 people and invested more than 60 million USD between 2000 and 2015. Nestle holds the core of the national market of bottled water³⁴. When interviewed, both representatives emphasised that their companies use local raw material, including packaging, but also that the export of milk and water allow for know-how transfer, and standardised certifications recognised at international level. Foreign capital investments in this occasion have created jobs and acted as an innovator. However, those MNCs, through their financial and thus political leverage have been able to negotiate ad-hoc trade regulations and preferential taxation to maintain a competitive position within the domestic market and eventually shape consumption choices top-down.

Therefore in this case study, beside the case of beverages, we do not observe a ‘foreign capital-driven sector’ for key food crops, or to a situation of ‘captive’ value chain where foreign firms use their financial power to subordinate local suppliers by creating technological, financial and job dependency. Indeed, agro-processing firms, while engaging with international partners, have been able to invest and upgrade, proposition which contradicts the literature that sees global retailer of HVCs as the main window for upgrading (Gereffi and Humphrey, 2005). The FDIs involved in the joint venture have been modulated by local governments and the GoU occupies a strategic position in crucial nodes of the market. As Mazzucato argued, venture capital operates under the coverage and warranty of the governments for the most uncertain and costly investments (2013). Thus the Government holds a crucial role in balancing risks and long term returns over time and people.

Finally, the earlier mentioned ‘mission-oriented’ agency has a crucial role in coordinating interventions for the growth of the horticulture sector by creating new markets through

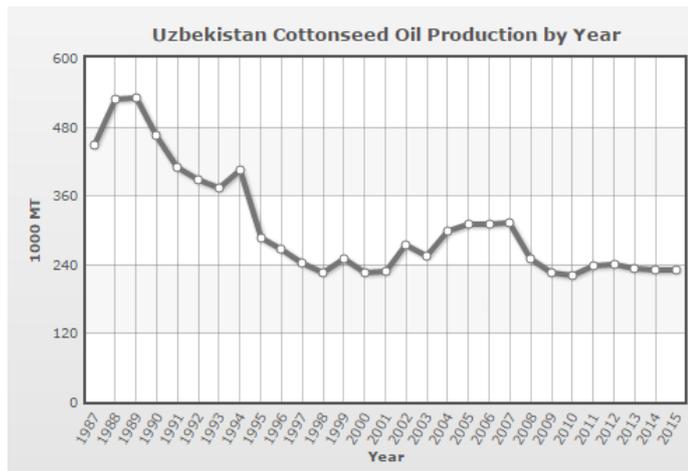
³³ The information reported here are based on the speeches of the two representatives at the international investment forum on November 5-6, 2015 in Tashkent Uzbekistan

³⁴ www.pwc.com/uz (2014)

marketing and logistics investments. Chang (2009) noted that short-term food security objectives during process of economic development are to be balanced taking into account of the time-bound nature of agricultural production (2009:482). Indeed, by mediating the flow of food exports, it avoided the fluctuation of food supply in the domestic market. Indeed, many fruits and vegetables farmers in the fieldwork interviews complained (fieldwork, December 2015) about the prices volatility across and within seasons, with many waste occurring especially during the summer. The agency has the power to block the export of certain food crops if domestic prices rise.

When assessing if and how emerging agribusinesses have influenced food consumption patterns, we observe that the consumers of those agribusiness products are mostly in foreign markets and urban areas. This pattern goes along with the consumption of new oils and processed food. Looking at *oil* consumption for instance, cotton oil is still the major source of fat used in Uzbekistan, especially in rural areas (USDA, 2010). Oil per capita consumption is estimated at around 15kg per year (ibid). However, the total amount of cotton oil produced has declined by half over the last 20 years, from 400 Mt in 1991 to 230 Mt in 2015 (USDA) and this trend will continue, considering that the land area devoted to cotton cultivation is planned to decline (figure 9.11). Currently Uzbekistan imports 30% of the domestic consumption of oil. To compensate such deficit, and also to address the urban demand for healthier oils such as sunflower oil, tariff for oil and oil products are at 20% which is nonetheless one of the lowest rate compared to other sector (i.e. fruits, or motor vehicles). Based on observations in supermarkets and *bazars*, non-cotton oils prices are three times more expensive than cotton oil. Poor rural households tend to consume cotton oil instead of healthier sunflower oil or butter. This evidence confirms the findings discussed in chapter 7, that there is a wide dietary diversity within the same food groups, namely oil and fats. In other words diet transition is reflected through diverging patterns of consumption which are often reflected within the same food groups.

Figure 9.11- Uzbekistan cottonseed oil production (MT)



Source: USDA

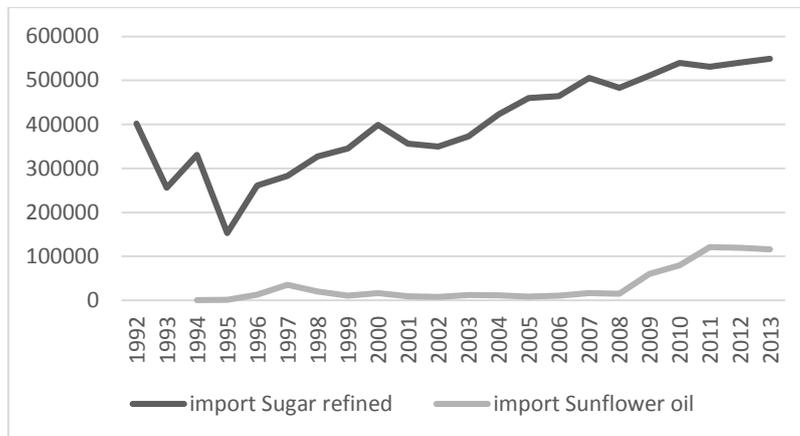
When looking at the volume of national imports for the period 1992-2012, according to the data available in FAOSTAT we can observe contrasting trends of different food types. For instance, exotic fruits (e.g. bananas, oranges), pet food, tea, coffee, sugar, and sweets (pastries chocolate), some animal protein (pork, chicken, eggs, cheese) vegetables oils (coconut oil, margarine, palm oil, sunflower oil) and preserved food increased. Those suggest an increasing use of fat, sugar and western-style products which confirm the patterns described by the diet transition theory. By contrast staple cereal such as rice and potato and HVC decreased (FAO, MT).

Sugar has been identified as an emblem of diet transition (Zhou et al., 2015). Sugar is highly subsidised and protected in both developing and western countries for different reasons, including maintaining stable prices and supply but also boost self-sufficiency in order to reduce the use of foreign exchange (Harris, 1986). Sugar is an important ingredient in the industry of processed sweets, such as biscuits etc. After a recorded price spike in 2014 in the country, ‘the Uzbek State Committee of Privatization, De-monopolization and Development of Competition’ planned to increase domestic production and processing facilities of sugar in order to satisfy the internal demand and be less reliant on sugar import³⁵. The annual demand for sugar in Uzbekistan is about 700,000 tonnes. Currently there are two production plants in the country, Khorezm Shakara and Angren Shakar. Although data on sugar production are not available, USDA gain report confirmed that import from Ukraine and Russia have decreased

³⁵ <http://www.worldfood.uz/> GoU undertook 304 food industry projects with investments for \$600 million until 2021

drastically in the last five years. Figure 9.12 shows that sugar import is still increasing but at a lower marginal rate.

Figure 9.12- Import of sugar and sunflower oil (MT)



Source: FAOSTAT

However, looking at the survey data, in rural areas the consumption of processed food derived from sugar is not widespread and among higher income, honey is often used as sweetener. However, according to fieldwork observations in August 2015 and December 2015 conducted into supermarket and bazars of the capital Tashkent, and confirmed by respondents living there, in urban areas consumption patterns are increasingly shifting from home-made sweets to already-made biscuits imported from Ukraine and Turkey or lower-quality Uzbek brands in case of lower income. Furthermore, the nationally produced agro-industrial products are present in the shelves of urban shops but are not consumed among the poor strata, especially in rural areas. The first cause is income. Those jars of fermented pickles are unaffordable for the daily consumption of the poor rural population. Although the GoU is clearly trying to expand the food industry of the country, as discussed in chapter 7, the lack of job opportunities create the conditions for the households to keep relying on their domestic labour-time for food preparations. This perpetuates the lack of high purchasing power and it hampers the condition to create an effective demand with negative impact on productive capability. Hence, it is crucial to break the vicious cycle of unemployment-low demand – food commercialisation. Furthermore, the import substitution settings present in the country have made certain food segments unaffordable or not available for the poor (Kornai, 1979).

A last point has to be made about the changing ‘topography’ of food suppliers. Indeed, the shift from bazars through the so called ‘*supermarketisation*’, although still rare, is emerging

in urban areas and it is affecting food consumption. According to government's plan, by 2030 70% of the retail food should comply with quality standards and be sold in shops and closed spaces as opposed to the current 37%. This shift will arguably ensure more efficient controls on sanitary measures for food safety and better coordination between distribution and producers (Shadibaev et al., 2015). On the one hand, this reform responds to the justified need to raise sanitary standards of the food products sold in the *bazars*. On the other hand, it will eliminate the competition of smaller petty sellers keeping them out of the commercial circuits from which they have gained their livelihood so far by selling their own domestically processed goods. Therefore, those standards risk having discriminatory impacts for smaller producers because have higher costs of compliance, contributing therefore to exacerbate differentiations (Booker et al., 2015; Oya and Pontara, 2015). Furthermore, they will also impact on poor consumers, being local bazar generally cheaper and giving the possibility to buy smaller amounts of food (Banwell et al., 2016). Therefore, the new commercial standards change market outcome and participation (ibid, 2016:1), both in terms of quality of the products than in the quantity of flow in circulation.

In conclusion, going back to the assessment of the state interventions to trigger mechanisms of transformation in the agro-food structure, it is argued that the GoU, through *ad-hoc* fiscal and trade regimes coordinates multiple objectives and generates upstream and downstream investments. Indeed, supporting small businesses through microfinance and market liberalization as the WB suggests would create risks linked to inputs supply disruptions due to price volatility or also lack of scalable financial investments necessary to finance new varieties of crops, expensive drip irrigations etc. or even worse, inequality as result of accumulation by dispossession. Thus, stated that the desirable objective is to create employment and inclusive growth, targeting small holders without integrated broader investment does not seem to be the driver of long-term sustainable growth (De Shutter, 2011). As in many other countries, the WB notes that *dekhans* are quicker to respond to market changes and minimize market risks and have higher productivity (2015). Such perspective ignores that there are multiple 'entry barriers' to the sector: first of all, many investments on crops have a lag period to wait for in order to get returns. Some examples are for instance the costly drip irrigation system and plastic sheet greenhouse. Second, what is completely underinvestigated in the mainstream research is the relationship between investments and the necessary access to capital and assets, other than the underlying power asymmetry embedded in such economic transactions. In sum, the agricultural policies implemented in the context of Uzbekistan, across all the crops studied, namely cotton, wheat

and F&V, consider the importance of economy of scale for the acquisition of machineries, coordination of labour, provision of public goods, and productivity of the land. Such kinds of investments need a solid source of public revenue which will be difficult to generate if trade is completely liberalised, especially in contexts of development.

Although the GOU maintains the control of the agricultural sector and thus it creates distortions, the rent produced from it is transferred within the national economy. Instead, in case such profit was co-opted by foreign traders, the revenue would have expatriated without creating any multiplier or spill-over effects in the local economy. Indeed, empirical evidences in other developing countries seem to confirm this hypothesis. As Kaplinsky has observed, in the early 1990s, once cash-crops exporting countries dismantled their marketing boards and liberalised the market, the benefits of the reduction of post-farm costs have not been appropriated by farmers, but rather by consuming countries (2004:12). As result, sub-contractual terms have worsened and small producers have been unable to escape the low rank positions within the buyer-driven horticulture global supply chain. In this perspective, small businesses producers would be exposed to unregulated liberalized markets, the market-related risks will be individualised by farmers themselves through insurance programs, with risks of reducing agricultural productivity (Chang, 2009).

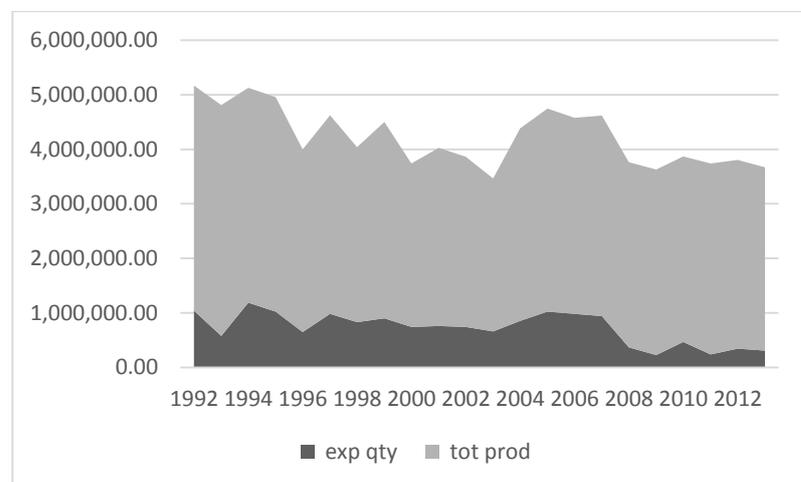
Instead, expanding, through centralized coordination, the local productive linkages through horizontal and vertical spill-overs fulfills not only economic targets, such as an increase in revenue, but it underpins also political and social goals, namely to create employment and guarantee a stable income for farmers. Because of the lack of public expenditure on investments, research, infrastructure, farmers would not be incentivised to produce more because of the risk of loss and waste attached (Chang, 2009). This scenario will not create a driver for national long-term sustainable and inclusive growth. It is thus argued that demand-side policies are pre-conditional to ensure food producers and net-buyers would not be the first loser of unintended market 'failures'.

9.5.1 Cotton as cash crop vs. food crop?

Referring back to the main research question, namely whether there is a trade-off between cash crops and food crops, in chapter 8 I answered the question at the micro level. Based on the survey findings, I have tried to untangle the mechanisms behind the interplay of agrarian production and food consumption. Now it is necessary to explore the role of cotton for the

food system at the macro level. In an interview (journal, 22/12/2015) Dr. Khaydarov, ministry of textile and chair of the joint-stock company *O'zbekyengilsanoat* which manages the cotton industry, affirmed that there is not a trade-off between food crops and cotton. The GoU has diverted the pattern imposed by the Soviet Union and squeezed cotton production in favour of wheat and other food crops over the past 20 years and the overall volume of production has decreased (figure 9.13). The governmental plan is to decrease the current cotton production by 1.1 million hectare (WB, 2015). Such reconfiguration of production was driven by multiple reasons: arguably, by the political objective of minimizing the risk of food deficit by boosting domestic food supply. Also, because of the low international prices over the last years. Not least, because of issues related to water scarcity³⁶, wildlife and soil poisoning, other human health and, as mentioned earlier, international pressures on labour rights. Therefore, the GOU decreased the role of cotton as exported raw cash-crops and it is focussing on upgrading the cotton processing by attracting FDIs in the textile and garment industry. In fact, looking at the proportion of cotton exported out of the total production, it passed from 25% in 1992 to 9% in 2013 and the goal is to continue increasing the share of domestically processed cotton.

Figure 9.13- Volume in million tonnes of cotton exported and produced



Source: FAOSTAT

In this context, the common understanding and rationale behind cash-crops has been disproven in two ways. First, because cotton, in its raw form, is becoming less export-oriented. Having the GoU identified new sources of agrarian commercialisation in HVCs, cotton lost its

³⁶ Studies have been focusing on the environmental implications of cotton production (E.g., Djanibekov, Mollinga, Chapagain et al. 2006) nevertheless this falls beyond the scope of this research.

role as source of revenue. Second, by avoiding risks of food insecurity and crop competitions through the implementation of centrally coordinated policies, the current setting does not put cotton in competition with food crops.

9.6 Conclusions

In this chapter, referring to the main research hypothesis in which I assumed no negative relationship between cash-crop and food outcomes, I have identified and discussed the key state-led interventions behind the Uzbek food regime. As Byres (2003) suggests, to analyse market transition it is necessary to look at the historical roots, social formation, development within agriculture and between agriculture and other sectors, the formation of classes, the nature of the state and the emerging contradictions. I have identified the mechanisms of protection, support, surplus extraction and exploitation around food crops and cash crops. I have identified the causal dynamics of production and linked them to consumption outcomes, trying to account also for the transition in preferences and income taking place in both rural and urban areas. I argued that the presented macroeconomic policies, by affecting the rural socio-technical system, not only contribute to explain diet outcomes, but also help to illustrate the mechanisms of market transition that lead to those outcomes.

The Uzbek food regime is characterised by a state agro-industrialisation through a range of subsidises and supported by import substitution and protectionism. The GoU buys and regulates the production and distribution of strategic food and cash-crops in the country, by managing means of productions and capitals, including land. In this sense, the GoU is identifiable as mediator between international market and farm producers. The institutional arrangements around the different crops are heterogeneous: on the highest level of regulation there is the state cash-crops *par excellence*, cotton. The GoU controls its export to acquire foreign currency. At the intermediated level there is wheat, a food crop, which is also subsidised and regulated in the production, but the GoU allows farmers to sell, consume or exchange a 'free-market' quota. In addition, it is noted an increase in wheat production by private *dekhans* to satisfy their own domestic needs. At the market level there are the HVCs, food crops which are produced for different commercial channels and therefore can be considered also cash-crops. Such crops diversification through marketisation has huge implications for the debates this research engages in. Here the state-led food regime has configured the agrarian structure to affect the scope and operationalization of cash crops, to drive commercialisation, food crops, and to avoid risks of food insecurity.

So far, this system allowed the government to access foreign currency, foster grain sovereignty, and create resilience from international price volatility, creating no immediate friction between food security and cotton production. Thus, as it has been observed in chapter 5 and 6, the current agricultural policies, composed of multiple mechanisms of procurement, subsidies and taxation have contributed to avoid risks of extreme poverty and inequality of farmers and provide the channels to preferential capital accumulations for some and food security for many.

Therefore, the Uzbek food regime can be considered part of the national developmental strategy (Agarwal, 2014, Byres; 1996; Bernstein, 2014) where agro-food export promotion and domestic grain security have been crucial state policies in supporting national growth during the delicate process of market transition. Food is also one of the main driver of social stability and indicator of welfare thus, supply disruptions would retard development in the phase of production, circulation, and consumption. Its system of provision is proven to be very complex because it involves patterns of market availability, sectorial taxation, and arguably competition to make prices affordable but also non-profit objectives which guarantee equal distribution across the population to a diversified and nutritious diet. Those factors are paradigmatic of the modes of production in place.

As discussed in this chapter, the GoU is shaping patterns of agricultural commercialisation in multiple ways. It is investing in the upgrading of HVCs through processing, and upgrading of the cotton sector. These investment help creating the conditions for an intra-sectorial structural transformation. The surplus created by the state-crops is indeed reinvested in mechanisation and technological innovation to spur added-value, and diversify production. The industrialization of agriculture cannot be analysed without considering the forward and backward linkages with the industrial and service sector (Hirschman, 1958). At the same time, those policies have been coordinated to support the stability of food prices through stable food availability, especially wheat. The food regime has proved to be a useful framework to grasp how the division of labour and reconfiguration of industries within agriculture help to define the condition of food access, and how state-capital relations help to explain those.

10. General conclusions

After having introduced the thesis in chapter 1, chapter 2 reviewed the different theories on agricultural commercialisation, agrarian class differentiation and agrarian transition. Chapter 3 investigated the broad debate on food security and the literature on the linkages between agricultural commercialisation and nutrition. It also discussed the literature on food sovereignty and the food regime to unpack the relations between food and the market. Chapter 4 discussed the contributions and gaps of the regional literature on post-Soviet agrarian transition and in Uzbekistan in particular. Chapter 5 outlined and explained the methodology adopted in the primary research of the thesis.

Starting from chapter 6, the thesis made various empirical and theoretical contributions. In summary, the empirical contributions of the thesis are threefold. First, it has enriched with primary data the body of knowledge on food system and patterns of food consumption in the Uzbek context. Second, it has also expanded the understanding of the evolving nature of agrarian class differentiation in Uzbekistan. Third, it has provided an understanding of the state-led structure of agrarian production and its related marketisation processes. Overall, on a theoretical level, the thesis has investigated the microeconomic intersections between marketisation in agriculture and state policies. Through the food regime approach, it explored the link between food, the state and the market. It has discussed how the peculiar state-market relations shape social relations of production, and give nature to specific mechanisms of food consumption, dynamics of accumulation from above and from below, and thus distributional outcome for the process of market transition.

In particular, chapter 6 explored the mechanisms underpinning processes of agrarian class differentiation. It has investigated how the state shapes forces of commodification in agrarian production through crop-specific policies. It has shown that class differentiation depends on the way the state has structured the access to land and means of production but also on how it regulated market channels. From there the thesis has analysed patterns of private and public accumulation.

Chapter 7 investigated how different types of producers have different food consumption patterns. Through the empirical evidence provided, the chapter has challenged the idea of a simple relationship between food production and food consumption. By contrast, it introduced the importance of understanding the dimensions of use, access, and exchange through an analysis of not only the market mechanisms of supply and demand, but also cultural values and gender norms which play a role in shaping diets. The analysis also reflected

on the standard measurements of food access and food security and discussed their limitations to assess quality diets, emphasising the crucial role for qualitative methods to grasp those complexities.

Chapter 8, by investigating the relationship between crop diversity, wealth and dietary diversity, has argued that the nature of food commercialisation and food consumption is intrinsically linked to the context-specific mechanisms and state policies underpinning the food system. Indeed, by testing through primary data many of the assumptions and arguments observed in the literature, it challenged some of those and it has shown that for instance marketisation does not always lead to lower crop diversity. Furthermore it has shown a complex relations between food availability, income and dietary diversity. Finally, it has argued that institutional arrangements such as subsidised access to inputs of production have a positive effect on dietary diversity and can play a crucial role in protecting access to quality diets and other social interests. Finally, it has provided an ontological and epistemological understanding of the definitions of commercialisation in agriculture.

Chapter 9 unpacked and discussed the role of the state in the Uzbek agricultural sector and in the process of market transition at large. Based on the discussion of relevant state policies, it has developed an understanding of the nature of the state in Uzbekistan, and used empirical evidence to show that those policies led to specific distributional outcomes. In particular, it has been shown that the state both at the micro level - through specific distributional policies of land, inputs and markets - and at the macro level- through policy of food self-sufficiency, trade policy and industrial policy, has supported food security and food consumption in the rural areas and in the country at large. Finally, it has discussed the Uzbek model of growth through the state-led patterns of accumulation.

Therefore, as this thesis investigated and illustrated from different angles, the marketisation process in Uzbek agriculture does not follow the recommendations of the mainstream literature. The GoU did not implement a rapid liberalisation of the agricultural sector, market deregulation, or land privatisation. Nonetheless, it did implement a very specific form of crop 'commercialisation', especially cotton and now F&V, to meet strategic concerns about export and as an instrument for the national economic transformation. The intensification of the recent crops commodification is transforming, although slowly, the relations of production and labour at the micro level, but also the conditions of distribution and access to food. Although further research is needed, it was clear from primary research that these investments have potential long-term positive implications on employment creation, and

thus on patterns of distribution and inequality. Therefore, state-led policies, balancing the objectives of agro-export and food security, are shaping the way that marketisation affects national food needs and poverty reduction.

As result of this model of growth, agricultural production, as discussed at the micro level in chapter 6, is characterised by a slow pace and low density of private capital accumulation when compared to other settings. As argued in chapter 9, this state-led approach is at odds with the mainstream literature, which argues that the commercialisation process should pass through the support to private investments, with the state relegated to a regulatory position on: providing core public goods, improving the climate for private investments, improving incentives by assigning property rights. According to this perspective, the top-down approach adopted by the GoU, which coordinates through joint ventures and consortiums the implementation of intensive gardening and agro-businesses, does not enable the creation of private business, and it creates market inefficiencies. However, heterodox public policies had a positive impact on agrarian transition. Since supply rarely creates its own demand, and in a situation of scarcity of private capital, abundance of unskilled labour and low fiscal capacity, such massive and extensive development processes of agro-food production is possible only through the state acting as regulator, investor, and partner of FDIs in the sector.

Moreover, the idea that the state on the one hand extracts surplus from farmers, but on the other hand provides them with basic inputs from which they secure their food provision, needs to be analysed in relation to the 'agrarian question' and the role assigned to agriculture and to the agrarian classes for economic transition (Kay, 2001; 2002). As Preobrazhensky (1965) theorised, in absence of external sources of surplus extraction such as colonial Britain, '*primitive socialist accumulation*', although coercive and unequal, is occurring as a way to achieve capital accumulation and thus growth (Bryceson, 1990; Saith, 2013). Finally, as Byres (2003:69-73 in Oya, 2004) argued, the most successful agricultural development and transformation, uneven and discriminatory, relied on cheap subsidies, credit, and price stabilization schemes.

Drivers of capitalist accumulation have been introduced in the economy however, they are often decoupled from the driver of profit. Arguably, this condition allows continuing investing in the demand side of the economy through public investments (Bhaduri, 2003). Overcoming the artificial separation between agriculture and industry and micro and macro dynamics allows us to understand the supply-side and state-market relations. However, further research would be needed to analyse the long-run economic outcomes of agro-food

diversification and industrial specialization (Friedmann and McMichael, 1989) on the necessary condition to create inclusive growth and internal effective demand (jobs). A key question for future research is whether the pattern of transformation allows the acquisition of sufficient quality food by vulnerable social groups, while also allowing the agricultural sector to compete in the domestic market and at the international level.

The two dimensions of *dekhans* and *farmers* disprove the corollary of homogenous farmer and show that their relationship with state policies and market gives nature to complex intersections. As well as labour relations, there are connections over the use, availability, and access to food and the commonly defined 'cash crops'. This case study confirms that even when the state is highly interventionist, class relations and power asymmetry are still identifiable and indeed these class relations are intensified by certain kinds of state intervention.

Food has provided a lens to untangle the changing social relations of production of rural Uzbekistan. However, at the heart of this thesis was a discussion about the relationship between marketisation and food consumption. Based on the evidence screened so far, and in answer to the central question posed by this thesis, the Uzbek case study does not show a trade-off between cash-crop and food crop because the regulatory and institutional setting does not create a direct competition between crops. As it progressed, in addition, the thesis has reflected on the categories and definitions of food-crops and cash-crops and it has confirmed that those are misleading. Indeed, those categories should be defined within the context of reference through a more inductive approach.

In addition, by looking at how the literature understands, classifies, and generates evidence of commercialisation processes, this case study has challenged the standard definitions of commercialisation as universal and uni-directional category, blindly applied to different contexts. It unpacked the epistemological and ontological dimensions of food production, exchange, and consumption and through the evidence provided in the case study, it has suggested the importance of untangling context-specific explanatory factors to understand and develop a coherent analysis of the market dynamics and the agents around it.

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<https://www.cotton.org/edu/pdf.cfm>

<http://www.cottonusasupplychain.com/free-trade-agreements> International commodity agreement (cotton) i.e.

<http://www.oecd.org/sti/ind/measuringtradeinvalue-addedanoecd-wtojointinitiative.htm>

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Appendix I: Name of the stakeholders in the cotton value chain

Name of the stakeholder	Function in the cotton commodity chain
Input suppliers	
<i>Uzkhimprom</i>	state joint-stock company which produces mineral fertilizers and crop protection chemicals
<i>Uzbekneftegaz</i>	the national oil and gas holding company, which supplies fuel
<i>Khlopkoprom</i>	cotton processing enterprises, state controlled agency supervising and operating cotton procurement and cotton gins.
<i>Agrobank</i>	issues loans to the farmers
<i>Uza gromashservice</i>	rents agricultural equipment (i.e. tractors)
<i>Uzkimyosanoat</i>	sells mineral fertilizers pesticides defoliant
<i>Uzbekenergo</i>	delivers electricity
<i>Uzbekneftegaz</i>	Supplies fuel and lubricants
<i>Uzagrotechservice</i>	service farming equipment
<i>Uzselkhoz mashleasing</i>	coordinates the lease of land
<i>Uzagrosugurta</i>	sells insurance to cotton producers
<i>Selkhozfond</i>	fund for payment for agricultural production farm committee and neighborhood <i>Mahalla</i> which under the ministry of finance allocates funds and ensures payments to cotton producers and accumulates profit from cotton export
Institutions-political figures	
<i>President</i>	sets the overall policy including volumes and varieties of raw cotton
<i>Prime Minister</i>	responsible for agriculture including the cotton sector and coordinates with <i>oblast</i> (districts) and <i>Hokimiats</i> (chiefs) during all phases of agricultural work
<i>Cabinet of ministers</i>	approves the legal framework and coordinates the activities of relevant ministries and monopoly enterprises that supply inputs to farmers and overall processes of growing and ginning cotton.
<i>Ministry of finance</i>	in consultation of Khlopkoprom and through Selkhozfond establish pricing policies, supplies credit for the production of cotton fiber, collects final profits from final sale on the international and national market
<i>Ministry of foreign Economic creations and trade</i>	establishes the export policy and oversees Uzbeks cotton trading companies and relations with foreign countries and companies
<i>Ministry of Agriculture and Water resources</i>	develops and produces production standards, overseas agro-services and the main water supply.
<i>State tax committee</i>	collect taxes and mandatory payments

<i>Ministry of higher education</i>	organizes the mobilization of student and teachers to pick cotton.
<i>Hokimiyats</i>	(local government administrator and Mahalla committee) ensure the mobilization of the population in the district to work the cotton harvest and make sure farmers meet the production quota.
<i>Cotton processors</i>	
<i>Khlopkoprom</i>	procures cotton and manages gins which conduct initial process of raw cotton separating the fiber from the seeds at the cotton gin. It can be compared to a sort of State marketing board (as it ensures guaranteed purchase and access to credit)
<i>Uzlegprom</i>	manufactures cotton yarn fabric knitwear and textile products
<i>Food Industry association</i>	extracts cottonseed oil
<i>Farmers</i>	grows raw cotton
<i>Uzprommashimpex, Uzmarkazimpex and Uzinterimpex</i>	Uzbek cotton trading companies sell cotton for export and domestic consumption on behalf of <i>Khlopkoprom</i> .

Appendix II: Summary of the forms of production in Khorezm

Source: Veldwisch and Spoor (2008)

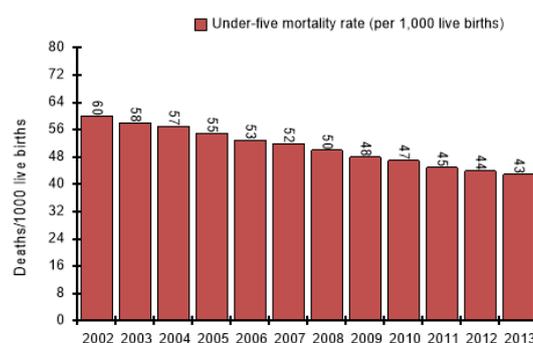
TABLE 1: SUMMARY OF THE THREE 'FORMS' OF PRODUCTION

Form of production	State-ordered	Commercial	Household
Main crops	Cotton, winter wheat	Rice, vegetables, fodder	In the garden: fruits and vegetables On the distant plot: winter wheat and rice
Crop schedule	Cotton from March/April to September/October Winter wheat from October to June	Rice from May/June to September/October Vegetables and fodder mainly in that same period	Winter wheat from October to June Rice from June to October
Land tenure	Long-term leaseholds; insecure as these can be withdrawn at will by the state	Long-term leaseholds; <i>farmers</i> grow these in their 'free' area; insecure as can be withdrawn by the state	Full-fledged ownership of gardens around the house and the distant plots
Management decisions	<i>Farmers</i> under strict state control (field checks)	<i>Farmers</i> ; or when rented out, the <i>dekhans</i> that sub-contract this land	<i>Dekhans</i> are free to make decisions
Organisation of inputs	Subsidised inputs through state controlled networks; capital intensive	Through informal and commercial networks; capital intensive	Minimal capital investments
Labour organisation	<i>Pudrat</i> ; a sharecropping-like system on typically 1–2 ha	Hired workers and/or renting out of small plots to <i>dekhans</i>	Household labour
Possible net profit*	For cotton US\$ 0–250/ha, also negative profits	US\$ 1,500–3,000/ha for paddy	Negligible – not for money; mostly self-consumed
Role of the state	Forcing centrally determined quotas on to individual <i>farmers</i>	Mandated by important individuals within the state hierarchy	Allocation of plots; securing enough available land
Economic rationale	Cotton and wheat still in part under the state-order system	Cash economy, marketing mostly in private markets	Household home consumption and barter economy
Technological and administrative task environment (TATE)	Detailed system of state rules and norms for agricultural management, inputs and technologies; enforcement through field checks and control over settlement accounts	Strongly restricted by system of permissions to grow, enforced by field checks; it is easier to get permissions for water-logged and saline land	By definition small areas that require manual operation; seeds are often reproduced and exchanged locally

Appendix III: Health and Nutrition data

Source: WHO

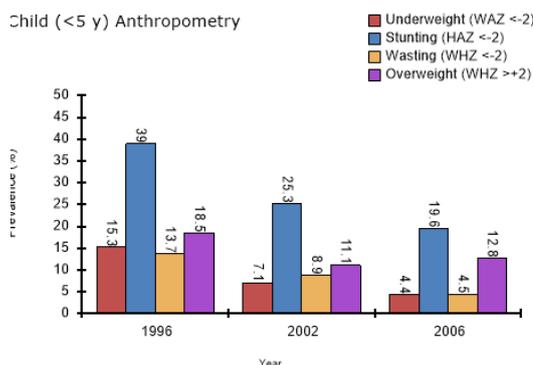
Under 5 Mortality



Vitamin and Mineral Deficiencies

Indicator	Year	Value
% Anaemia children <5 y (Hb <110 g/L)		no data
% Anaemia pregnant women (Hb <110 g/L)		no data
% Clinical vitamin A deficiency in women (history of night blindness during most recent pregnancy)		no data
% Subclinical vitamin A deficiency in preschool-age children (serum/plasma retinol <0.70 µmol/L)		no data
Median urinary iodine concentration (µg/L) in children 6-12 y	2005	141.2

Child (<5 y) Anthropometry



Health Services

Indicator	Year	Value
% Births attended by skilled health personnel	2006	99.6
% Children 6-59 months receiving vitamin A supplements (dose 1)	2013	99.0
% Children 6-59 months receiving vitamin A supplements (dose 2)	2013	99.0
% Children aged 1 y immunized against measles	2013	97.0
% Children with diarrhoea who received zinc		no data
% Population using an improved sanitation facility	2012	100.0
% Population using improved drinking water sources	2012	87.0
% Women receiving iron and folate supplements during pregnancy		no data

Indicator	Year	Value
General government expenditure on health as % of total government expenditure	2012	9.7
Total expenditure on health as % of gross domestic product	2012	5.9
Per capita total expenditure on health (US\$)	2012	220.8
Nutrition component of the United Nations Development Assistance Framework (UNDAF)		no data
Nutrition component of Poverty Reduction Strategy Paper (PRSP)		no data
Nutrition Governance		no data
Maternity leave	2009	126 days

Food Security

Indicator	Year	Value
% Population below \$1 per day	2003	46.3
% Population below minimum level of dietary energy consumption	2011	6.1
Iodised salt consumption (% households consuming adequately iodised salt - 15 parts per million or more)	2006	53.0

Nursing and midwifery personnel density per 1,000 population	2012	12.0
GDP per capita (PPP US\$)	2011	3,310
GDP per capita annual growth rate (%)	2011	5.4
Official development assistance (ODA) received (net disbursements) (% of GNI)	2010	0.6
Low-Income Food-Deficit Country (LIFDC)	2012	Yes

Appendix IV: Farmer survey questionnaire in Uzbek and English

So`rovnoma Samarqand viloyati (Farmer xo`jaliklari) Farm questionnaire Samarkand

	Question- Savol	Answer- Javob
	/ Aqida / Lorena / abdu same	
1	bugungi sana, hozirgi vaqt s date and time	
2	District - (QFY) Qishloq Fuqarolar Yig'ini	
3	So`raluvchining F.I.Sh. va tel: Name of respondent (farmer) F.I.O	
4	So`raluvchi jinsi Xo`jalik rahbari:	Erkak Male <input type="checkbox"/> Ayol female <input type="checkbox"/>
5	Age Yoshi (rahbar)	-----
6	xo`jaligini tashkil etilgan vaqti Farm establishment date	-----
7	Ma`lumoti (ta`limi) tugatgan Education	9-sinfni tamomlagan <input type="checkbox"/> 11 sinfni tam. <input type="checkbox"/> Kollej, tehnikum <input type="checkbox"/> Oliy O`quv yurti (o`qiydi) tamomlagan <input type="checkbox"/>
8	Uyda o`z bolalaringizdan tashqari yana kimlar birga yashaydi? Besides spouses and own children, who else lives with you at home	Pare <input type="checkbox"/> - Ota-onasi <input type="checkbox"/> Cousins- Jiyanlari <input type="checkbox"/> Brothers- Aka-ukalari <input type="checkbox"/> Sisters- Opa-singillari <input type="checkbox"/> Total: number
9	So`nggi 12 oyda so`raluvchi bajargan faoliyat turlaridan olgan barcha daromadlarini (naqd va shunga o`xshash) belgilang List ALL of the REMUNERATED/INCOME GENERATING activities (cash or in kind) that the respondent has worked on over the past 12 months. Husband Wife Son/doughters	1) <input type="checkbox"/> Vaqtinchalik (kundalik) qishloq xo`jaligi ishchisining ish haqi daily- Temporary /farm wage worker: (contract workers) on call 2) <input type="checkbox"/> Mavsumiy ishchining ish haqi Seasonal farm wage worker:: 3) <input type="checkbox"/> Doimiy ishchining ish haqi Permanent farm wage worker: 4) <input type="checkbox"/> xo`jalik egasi farmer owner 5) <input type="checkbox"/> Oziq-ovqat va alkogolsiz ichimliklar ishlab chiqarish Food or beverage processing/production: 6) <input type="checkbox"/> Qurilish ishlari Construction work 7) <input type="checkbox"/> Ulgurji, chakana savdo, restoran, kafe yoki remont ishlari Wholesale or retail trade, restaurant, café or repairs 8) <input type="checkbox"/> Uy hayvonlari boqish Herding livestock: 9) <input type="checkbox"/> Ijtimoiy soha, o`qituvchi, hamshira Public sector teacher, nurse 10) <input type="checkbox"/> Huquqshunos yoki boshqa davlat ishchisi law enforcement or Other government employee-- 11) <input type="checkbox"/> xususiy sector o`qituchisi, instructor yoki repetitor (tutorship) instructor or tutor: 12) <input type="checkbox"/> haydovchi bilan birga Transportation, including taxi:

		13) <input type="checkbox"/> servis (kir yuvish, etikdo`z, sartarosh) services (laundry, hairdress, shoes repair, haircutting) – 14) <input type="checkbox"/> Duradgor, mebel yasovchi, sangtarosh Wood processing, furniture production, stone quarrying/crushing – 15) <input type="checkbox"/> tikuvchilar, to`quvchilar 1 Textile workers, tailors 16) <input type="checkbox"/> Qorovul, qo`riqchi Security guard <input type="checkbox"/> 17) Yig`uvchi (masalan, meva), musor yig`uvchi, musorni qayta ishlovchi 18) <input type="checkbox"/> Talaba Student - 19) <input type="checkbox"/> Pensioner
10	(agar birdan katta bo`lsa)Shulardan asosiy daromad manbai qaysi ish ? Which job is the main source of income?	
11	(agar birdan katta bo`lsa)Vaqtning qancha foizi In which percentage of time (If more than one)-	
12	narxi qancha? Siz uy a`zolaringizdan bo`lmagan biron kishidan pul o`tkazmalari qabul qilasizmi Do you receive remittances? If yes, how much	Yo`q <input type="checkbox"/> Ha <input type="checkbox"/> -----M.So`M
13	Qishloq xo`jaligi (korxonasi) turi type of farming	Fermer xo`jaligi <input type="checkbox"/> Dekhon Xo` Jaligi <input type="checkbox"/>
14	Xo`jaligingizning yer maydini qancha How many hectares is your farm? –	-----GA
15	Xo`jalikda haftasiga qancha kun/soat mehnat qilasiz How many days/hours per week you work in the farm	Har Kuni <input type="checkbox"/> <input type="checkbox"/> Dam olish Kunlari Boshqa <input type="checkbox"/>
16	Siz ko`proq davlat mahsulotlari (kugzi bug`doy, paxta) yetishtirasizmi yoki boshqa ekinlarmi? Do you spend more time on state crop (cotton/wheat) or other crops? –	bug`doy, <input type="checkbox"/> paxta <input type="checkbox"/> Boshqa <input type="checkbox"/>- <input type="checkbox"/> Sabzavotlar Meva <input type="checkbox"/> Chorva <input type="checkbox"/>
17	Davlatan yerni ijaraga olgonmisiz Do you lease this plot from the government? Yerni vagtincha ijaraga olganmisiz? Do you rent the land?-	Ha <input type="checkbox"/> Yo`q <input type="checkbox"/> Ha <input type="checkbox"/> Yo`q <input type="checkbox"/>
18	Bonitiet bal yer solig'i (land tax)	

19	<p>Siz yeringizda qanday ekinlar yetishtirasiz?</p> <p>Ularni keltiring</p> <p>Which crops do you cultivate in your land, in hectares</p>	<p>Bug`doy – Wheatga <input type="checkbox"/></p> <p>Paxta- cottonga <input type="checkbox"/></p> <p>Sabzavotlar - vegetables <input type="checkbox"/></p> <p>.....gaga.</p> <p>.....gaga</p> <p>Mevalar- Fruits <input type="checkbox"/></p> <p>.....gaga</p> <p>.....gaga</p> <p>ga.....</p> <p>Oziqa ekinlari</p> <p>(.....ga.)</p>
25	<p>Yalpi mahsulot / Hosil tonna</p> <p>(Gross product/ harvest ton)</p>	<p>.....ga <input type="checkbox"/></p> <p>Bug`doyga <input type="checkbox"/></p> <p>Paxta.....ga <input type="checkbox"/></p> <p>Sabzavotlar <input type="checkbox"/></p> <p>.....gaga.</p> <p>.....gaga</p> <p>Mevalar <input type="checkbox"/></p>
20	Almashlab ekish mydoni	
21	<p>Moliyaviy jihatdan qaysi ekin eng muhim hisoblanadi</p> <p>What is the most important crop in financial terms</p>	
a21	Nima uchun ? WHY?	
22	<p>Agar ayni paytda boshga bir sabzavot yoki ekin etishtirish xohlaysizmi?</p> <p>Would you cultivate some vegetables or crop that you are not producing at the moment?</p>	<p><input type="checkbox"/>Ha</p> <p><input type="checkbox"/>Yo`q</p> <p>-----</p>
23	<p>Agar bo`lsa bu sotishgami yoki ist`molgami ?</p> <p>If yes, to sell it or to consume it?</p>	<p>istem <input type="checkbox"/>ga</p> <p>sotishg <input type="checkbox"/></p>
24	<p>Agar bo`lsa , Nima uchun yetishtirmadingiz?</p> <p>Why dont ' you produce it?</p>	<p>Yer (soil condition) <input type="checkbox"/></p> <p>state contract <input type="checkbox"/></p> <p>sug`orish (irrigation) <input type="checkbox"/></p> <p>Agrotexnikasini bilmayan skills <input type="checkbox"/></p>
26	<p>Sug`orish turi</p> <p>type of irrigation</p>	<p>Kanaldan canal <input type="checkbox"/></p> <p>Tomchilatib drip irrigation <input type="checkbox"/></p> <p>Nasos orqali pumping <input type="checkbox"/></p> <p>Kachlka</p> <p>Yo k</p>
27	<p>Siz mahalliy hokimiyatdan biron yordam olasizmi?</p> <p>Do you receive any kind of support from the local administration?</p>	<p>- Traktorlar tractor <input type="checkbox"/></p> <p>- Urug`lik seeds <input type="checkbox"/></p> <p>Minarel o`g`it fertilisers <input type="checkbox"/></p> <p>Suv irrigation <input type="checkbox"/></p>

		Kredit <input type="checkbox"/> Qishloq Xojalik (extension services) <input type="checkbox"/>
28	Siz xo`jaligingizda yollanma mehnat jalb qilasizmi? Do you hire labour to help you with the farm?	Ha-yes <input type="checkbox"/> Y`ok -no <input type="checkbox"/> :SONI number
a 28	Qancha muddat ? How many	
29	If yes, Salary of employee – Agar bo`lsa ishchilarga qanday haq to`laysiz?	Oylik monthly <input type="checkbox"/> Kunlik- Daily <input type="checkbox"/> natura In kind <input type="checkbox"/>
29a	Qancha siz ularga to`laysiz WORKERS SALARYm. som`s
	commercialisation Tijoratlashtirish- Taqsimot	
30	Siz mahsulotingizni qaerga sotasiz? Where do you sell your crops?	<input type="checkbox"/> Dehqon bozori (chakana) bazar <input type="checkbox"/> Ulgurji -Wholesale <input type="checkbox"/> Qayta ishlash korxonalari - Processing companies <input type="checkbox"/> Own- consumption for family Ishchilarga natural ish haqi - As in kind to employee <input type="checkbox"/> Davlat xaridlari - Public procurement
31	Agar mahsulotlaringizni ikki va undan ortiq joyga sotsangiz ulushi qanday va bahosi If more than one destination, in which %	<input type="checkbox"/> Mevalar Bozorga % va bahosi Ulgurji, % va bahosi Qayta ishlash korxonasi, % va bahosi..... Ish haqi % va kg <input type="checkbox"/> Sabzavotlar Bozorga % va bahosi Ulgurji, % va bahosi Qayta ishlash korxonasi, % va bahosi..... Ish haqi % va kg
32	Agar bozorda sotsangiz , mahsulotni kim sotadi? (If yes bazaar) Who goes to sell it at the bazar	Xotinim- Wife <input type="checkbox"/> Qarindoshlarim- Relatives – <input type="checkbox"/> O`zim - My self <input type="checkbox"/> friends <input type="checkbox"/>
33	KM: Bozorgacha masofa Distance in km from bazar Qancha Muddat?	
34	Oila uchun oziq-ovqatlarni kim xarid qiladi? Who goes to buy food in your family?-	Dadan <input type="checkbox"/> Onan <input type="checkbox"/> Xotinim <input type="checkbox"/> O`zim <input type="checkbox"/>

35	Kim oilangizda ovqat tayyorlash ? Who prepare the meals in your family? (father, mother, wife, myself)	Dadan <input type="checkbox"/> Onan <input type="checkbox"/> Xotinim <input type="checkbox"/> O'zim <input type="checkbox"/>
36	Siz konservalangan tayyor mahsulotlar sotib olasizmi (chips, pecheniyi, kolbasa, sosiska,)? qancha vaqtda? How often Aynan nima? Do your buy prepared food or canned food	Ha <input type="checkbox"/> Yo`q <input type="checkbox"/>
37	Xotiningiz/ onangiz ishlaydimi? Does your wife/mother work outside home	Ha <input type="checkbox"/> Yo`q <input type="checkbox"/>
38	Xotiningiz/ Onan fermer xo'jaligi sizga yordam beradimi?	Ha <input type="checkbox"/> <input type="checkbox"/> -
ASSET INDEX – Shaxsiy indeks So`raluvchining vositalardan foydalanish imkoniyatlari		
39	<input type="checkbox"/> Elektr (davlat ta'minoti) <input type="checkbox"/> Elektr (xususiy generator) <input type="checkbox"/> Davlat jo'mrakdan quvur suv <input type="checkbox"/> Shaxsiy Suv yaxshi sifatli <input type="checkbox"/> Quduq suvi (burovaia) <input type="checkbox"/> Daryo , soy , ko'l suvi <input type="checkbox"/> Yomg'ir suvini yig'ish <input type="checkbox"/> Qadoqlangan suv <input type="checkbox"/> Ko'mirda isitish <input type="checkbox"/> go'ngda isitish <input type="checkbox"/> o`tinda isitish gaz balonda <input type="checkbox"/>	Electricity (public supply) Electricity (private generator) Piped water from public tap Water from private protected well Water from borehole (burovaia) Water from a river, stream, lake Water from rain water collection Bottled water Coal hitting Manure hitting Wood hitting Gaz tank
40/4 1	OSHXONA <input type="checkbox"/> Elektr choynak (tefal) <input type="checkbox"/> elektr plita (stove) <input type="checkbox"/> ko'mir pechka (cooker) <input type="checkbox"/> xolodilnik (fridge) <input type="checkbox"/> Kreslolar (boiler) <input type="checkbox"/> Tova/ skovorodka (pans) <input type="checkbox"/> kir yuvish mashinasi (sewing mashin) <input type="checkbox"/> idish-tovoq yuvish mashinasi (washing machine) <input type="checkbox"/> Ovqat pishirish tashqarida (ochiq joyda) amalga oshiriladi (hitting system) <input type="checkbox"/> Ovqat pishirish oshxonada amalga oshiriladi (hitting system)	DEVOR material (walls) <input type="checkbox"/> taxta <input type="checkbox"/> loy <input type="checkbox"/> fanera, <input type="checkbox"/> tosh <input type="checkbox"/> tsement <input type="checkbox"/> G'isht Cooking is done in a separate kitchen house Cooking is done outside Cooking is done in a kitchen room
42/4 3	UY POLINING TURLARI (floor) <input type="checkbox"/> yog'och plitalari,(wood) <input type="checkbox"/> Vinil oboylar <input type="checkbox"/> Sopol plitkalar, (ceramic tiles) <input type="checkbox"/> tsement (cement) <input type="checkbox"/> g'isht (bricks) <input type="checkbox"/> gila (carpet)	Tomning Tashqi tomoni (roof) <input type="checkbox"/> plastik <input type="checkbox"/> yog'och (wood) <input type="checkbox"/> tunika <input type="checkbox"/> shefir <input type="checkbox"/> beton <input type="checkbox"/> cherepitsa

44	<p>Possessions and assets</p> <input type="checkbox"/> Ekinlar uchun omborxonalar <input type="checkbox"/> Konditsioner <input type="checkbox"/> kompyuter <input type="checkbox"/> Internet <input type="checkbox"/> Mototsikl / Skuter <input type="checkbox"/> Arava <input type="checkbox"/> barana <input type="checkbox"/> Avtomobil <input type="checkbox"/> Radio - kassetali - CD player <input type="checkbox"/> TV <input type="checkbox"/> petrol/gas <input type="checkbox"/> DVD player , VCR <input type="checkbox"/> Sun'iy yo'ldosh piyola / box , DSTV <input type="checkbox"/> tikuv mashinasi <input type="checkbox"/> Bank Hisob <input type="checkbox"/> tractor <input type="checkbox"/> metall yoki yog'och karavot <input type="checkbox"/> divan <input type="checkbox"/> Ruxsat etilgan telefon liniyasi	<p>Storage facilities for crops AIR conditioner Computer Internet Motorcycle/Scooter/Bajaj Animal-drawn Cart Ox plough Car/ Radio-cassette-CD player TV Kerosene Dvd player, VCR Satellite dish/box, DSTV Sewing machine Bank Account Mattress metal or wood bed Sofa Fixed telephone line</p>
45	cows sigirlar	
b	Волы / быки Oxen / bulls/ buqa	
c	ЛошадиHorse/ OT	
d	Donkeys / mules Ослы / мулов / eshak	
f	CamelsВерблюды / Tuya	
g	Овца Sheep / qo'ylar	
h	Goatsкозел / echki	
i	ChickensКурь / tovuq	
l	Beehives Ульи / Asalari gutisi	

(FANTA FAO module) FOOD CONSUMPTION – Oziq-ovqat iste`moli

46	<p>O`tgan oyda barcha turdagi oziq-ovqatlarga jami daromadingizning qanchasini sarfladingiz? Over the PAST MONTH, what was the proportion of your TOTAL expenditure that you spent on ALL TYPES OF FOOD?-</p>	<p>dan kam 50%- <input type="checkbox"/> orasida 50% and 75% <input type="checkbox"/> More than -75%- dan ko`p <input type="checkbox"/> don't know- bilmayman <input type="checkbox"/></p>
47	<p>Siz iste`mol qiladigan oziq-ovqatlarning qancha qismini tashqaridan sotib olasiz? What is the part of the meal you are obliged to buy because you don` t produce?</p>	

48	<p>Agar siz qo`shimcha daromadga ega bo`lsangiz oilangiz uchun yana nima sotib olardingiz?</p> <p>faqat bir tanladi</p> <p>In case of extra income, what would you buy for your family?</p>	<input type="checkbox"/> Qo`shimcha go'sht <input type="checkbox"/> baliq <input type="checkbox"/> Qoshimcha ichimliklar <input type="checkbox"/> Qishloq xo'jaligi resurslari (TRAKTOR yoki suv) <input type="checkbox"/> Ta'lim <input type="checkbox"/> Uy uskunalari <input type="checkbox"/> avtomobil <input type="checkbox"/> Dam olish
49	<p>Oxirgi to`rt haftada/30 kunda siz yoki oila a`zolaringizdan birontasi mablag` yetishmasligi oqibatida hohish yuqori bo`lgan biron mahsulotlarni iste`mol qilmagan holat bo`ldimi?</p> <p>In the past four weeks/30 days, were you or any household member not able to eat the kinds of foods you would have preferred</p>	Ha <input type="checkbox"/> Yo`k <input type="checkbox"/>
50	<p>Agar bo`lsa</p> <p>If yes How oftarn (number of times)</p>	Kam (1-2 -marta) Ba`zan (3-10 marta) Tez-tez (ortiq 10 marta-)
51	<p>Oxirgi to`rt haftada/30 kunda siz yoki oila a`zolaringizdan birontasi oziq-ovqat yetishmasligi natijasida keragidan kamroq ovqat edimi?</p> <p>In the past four weeks/30 days, did you or any household member had to eat a smaller meal than needed because there was not enough food? -</p>	Ha <input type="checkbox"/> Yo`k <input type="checkbox"/>
52	<p>Agar bo`lsa</p>	Kam (1-2 -marta) - Ba`zan (3-10 marta) Tez-tez (ortiq 10 marta-)
53	<p>Oxirgi to`rt haftada/ 30 kunda (1 oyda) siz yoki oila a`zolaringizda oziq-ovqat yetishmasligi natijasida kamgina ovqat yeyishi holatlari kuzatildimi? So`nggi 3 oydachi? So`nggi 12 oydachi?</p> <p>In the past four weeks/30 days (1 months), did it happen that you or any household member had to eat fewer meals in a day because there was not enough food? What in the past three months?</p>	Ha – Yes - Yo`q- No -
54	<p>If yes:- Agar bo`lsa</p>	Kam (1-2 -marta) Ba`zan (3-10 marta) Tez-tez (ortiq 10 marta-)
55	<p>So`nggi to`rt haftada/ 30 kunda (3 oyda) siz yoki oila a`zolaringizdan birontasi ovqat tayyorlashga vaqtlaringiz bo`lmaganligi uchun ovqatlanmay qolgan holatlaringiz bo`ldimi?</p> <p>In the past four weeks/30 days (3 months), did it happen that you or any household member skipped a meal due to lack of time to prepare it?-</p>	Ha – Yes - Yo`q- No -
56	<p>If yes:- Agar bo`lsa</p>	Kam (1-2 -marta) - Ba`zan (3-10 marta) Tez-tez (ortiq 10 marta-)
57	<p>So`nggi to`rt haftada/30 kunda siz yoki oila a`zolaringizda og`aynilar va qo`shnilardan oziq-ovqatlarni qarzga olish holatlari bo`ldimi?</p>	Ha – Yes - Yo`q- No -

	In the past four weeks/30 days, did it happen that you or any household member had to borrow food from relatives or neighbours	
58	If yes:- Agar bo`lsa	Kam (1-2 -marta) Ba`zan (3-10 marta) Tez-tez
59	In the past four weeks/30 days, did it happen that you or any household member had to get food on credit from a shop or trader? - So`nggi to`rt haftada/30 kunda siz yoki oila a`zolaringizda magazine yoki savdogardan oziq-ovqatlarni kreditga olish holatlari bo`ldimi?	Ha – Yes - Yo`q- No -
60	If yes:- Agar bo`lsa	Kam (1-2 times-marta) - Ba`zan (3-10 times-marta) Tez-tez (more than 10 times- ortiq)
61	Oziq-ovqat siz salomatligi uchun juda yaxshi , deb o`ylayman ? WHICH FOOD you think is very good for your health?	-
62	Which food you think is the most expensive at the market? – Sizning fikringizcha, bozordagi eng qimmat oziq-ovqat turi qaysi?	G`osht - Meat Fruit- Meva Some particular vegetables- Sabzavotlarning ayrim turlari Bread- Non Milk- Sut
63	So you do not buy it? If above – Buning natijasida siz quyidagilardan qaysi birlarini sotib ololmayapsiz?	G`osht - Meat - Fruit- Meva Some particular vegetables- Sabzavotlarning ayrim turlari Bread- Non Milk- Sut

DIETARY DIVERSITY QUESTIONNAIRE (24 H recall) – Oziq-ovqat iste`moli sorovnomasi (24 soat ichida)

Iltimos, kecha kun davomida va kechqurun uyda va tashqarida iste`mol qilg gazaklaringiz haqida ma`lumot bersangiz. Ertalab yegan birinchi oziq-ovqat

Breakfast Nonushta	Gazak snack	Lunch tushlik	Gazak Snack	Dinner Kechki ovqat	Gazak Snack

Quyidagi jadvalda so`raluvchi eslagan barcha oziq-ovqat va ichimliklarni yozing. So`raluvchi aytib bo`lgandan keyin undan yana bir marta eslashi haqida iltimos qiling

Question number	Food group- Oziq-ovqat guruhi	Categories – Toifasi	-Ha- YES=1 – Yo`q-NO=0
64	CEREALS- Don	Rice Buckweath Bread Pasta Maize Pizza oatmeal	Guruch Grichka non makaron Makkajo`xori pizza suli yormasi

65	VITAMIN A RICH VEGETABLES AND TUBERS	pumpkin, carrots squash sweet pepper	qovoq sabzi skoush shirin qalampir, balgarski
66	WHITE TUBERS	white potatoes	kartoshka
67	DARK GREEN LEAFY VEGETABLES vit A	Kale spinach cabbage broccoli	Qal'aning ismaloq karam brokoli
68	OTHER VEGETABLES	Cucumbers Onion Aubergine Mushrooms Courgettes Asparagus lettuce	bodring Piyoz baklajan Qo'ziqorinlar Qovoq Sarsabil Letuce - Sutcho'p
69	VITAMIN A RICH FRUITS	cherry tomato watermelon apricots (fresh /dry) peaches granat, plums	olcha pomidor tarvuz o'rik shaftoli Anor , olxo'ri
70	OTHER FRUITS (vitamin C)	berries melon banan, oranges, limon kiwi	Reza, buta mevasi, qulupnay, maymujon qovun banan , apelsin limon kiwi
71	ORGAN MEAT (IRON- RICH)	liver kidney heart	jigar , buyrak , qorin
72	MEATS	beef, sheep lamb goat rabbit wild game chicken duck birds	mol go'shti , qo'ylar qo'zichoq, echki quyon, yovvoyi o'yin , tovuq, o'rdak, qushlar
73	EGGS	tuxum	tuxum
74	FISH(vitamin D)	fresh or dried fish or shellfish tuna, salmon	yangi yoki quritilgan baliq yoki qisqichbaqasimonlar Tuna , salmon
75	LEGUMES, NUTS AND SEEDS (vitamin E)	beans chickpeas peas, green lentils, nuts seed	loviya no'xat yashil yasmiq yong'oq urug'lar
76	MILK AND MILK PRODUCTS	Milk (nestle or domashie) Cheese susma smetana kefir	Sut pishloq tinmay Smetana kefir

78	OILS AND FATS	Cotton oil Sunflower oil Butter Margarine Olive oil	paxta moyi bandi yog'i yog ' Margarin zaytun moyi
79	SWEETS	sugar, honey, pops (coca cola, pepsi, Fanta,) chocolates, candies, cookies	shakar , asal , pop (Coca-Cola , Pepsi , Fanta , shokolad , konfet, kurabiye va kek
80	SPICES, CONDIMENTS, BEVERAGES	Vodka Whiskey Ketchup Grounded coffee (nescafe) Green tea Black tea Tetrapack juice	Aroq Whiskey ketchup Tuproqli qahva (nescafe) yashil choy qora choy Sharbat
			-Ha- YES=1 – Yo`q-NO=0
81	Siz kech uydan tashqarida (restoran yoki choyxona) ovqatlandingizmi? Did you eat anything (meal or snack) outside of the home yesterday? –		HA YOK

Ochiq fikrlaringiz uchun rahmat! End of the questionnaire – Thanks!

Comments: - Izohlar

Tugash Vagti:

Appendix V: Guideline questions for semi-structured interviews to food processing company

- What are the main primary products you process?
- Is this a public private partnership company?
- Are the product directed to national or international market (export), and in which proportion?
- Is the current national trade policy on tariffs supporting the business?
- Do you have any direct national competitors?
- Which kind of investments did you do on machineries and storage? How?
- How many people are employed here? What are the geographical origin and gender of unskilled force labour employed? Is it seasonal? Salary? More female or male?
- Do you rely on contract based local procurement of fruits and veg. ? Are the contracts stipulated through hokimiat? How the farmers know about you?
- What is the biggest challenge/ problem to face in your business/ work?
- Specifically how easy or difficult it is to secure supply of fruit and vegetables?
- Who are the biggest local suppliers?
- How easy or difficult is to recruit labour? What are main labour problems?
- What is the average salary?

Appendix VI: Prices observed in Tashkent bazar in different seasons

No	Name of product	Measure unit	Price in Sums – summer sept 2015	Price in Sums fall
1	High grade flour	Kilogram	3100	3100
2	Low grade flour	Kilogram	2400	2400
3	'Brick' bread	600 grams	750	750
4.1	Obi-non (common round loaf of bread) 100-150 gr	Gram	750	850
4.2	Patyr-non (round loaf 'patyr') 250-300gr	Gram	1200-2000	300
5	Wheat grain	Kilogram	2800	2900
6	Other grains	Kilogram	3000	
7	Rice	Kilogram	12000 (plov)	13000
8	Pasta	Kilogram	6690	6690
9	Onions	Kilogram	1500	1500
10	Garlic	Kilogram	1000	1200
11	Potatoes	Kilogram	1200	2000
12	Tomatoes	Kilogram	1500	2500
13	Carrots	Kilogram	2500-3000	3000
14	Beans, kidney beans, etc.	Kilogram	7500	7500
15	Apples	Kilogram	4000	5000
16	Citrus fruit	Kilogram	16000 (orange Egypt) 1000 lemon local	n/a 1200 lemon local
17	Grapes	Kilogram	3000 (black) 15000 (big red)	5000 and 15000
18	Dried fruits	Kilogram	20000-40000	20000-40000
19	Nuts (walnuts)	Kilogram	45000	45000
20	Beef	Kilogram	35690 (fillet)	36000 (fillet)
21	Chicken meat	Kilogram	15000	15000
22	Animal-origin fat, lard	Kilogram	10000	
23	Lamb	Kilogram	39990	n/a
24	Fresh fish	Kilogram	15000 (silver carp)	16000
25	Eggs	10 pieces	6000	6000
26	Fresh milk	Liter	2500 (street) 5000 (packed)	2500 (street)

				5000 (packed)
27	Vegetable oil	Liter	9000	9000
28	Butter	Kilogram	9990 (local) 39000 "president")	9990 (local) 39000 "president")
29	Margarine	Kilogram	4290	
30	Sour milk (kaimak)	Kilogram	15000	15000
31	Salt	Kilogram	2000	2000
32	Green tea	Kilogram	14000 6590(packed)	
33	Instant coffee	100 grams	33390 (Jacobs)	35000
34	Sugar	Kilogram	3200	3500
35	Coal	Ton	600000	n/a
36	Local beer	Liter	4000	5000
37	Coca-cola	Jar	2000	2300
38	Local vodka	0.5 liter	8000-15000	9000- 19000
42	Toilet soap	Palmolive Bar	2500	3000
44	Local bus fare	ticket	500	700

Appendix VII: Principle Component Analysis (PCA) for Asset index

In order to identify the level of wealth among the farmers interviewed during the survey, to then scan it in relation to other indicators related to commercialisation and nutritional outcomes, the current section will look at how ownership of assets has been used as a 'proxy' of economic status. As explained in Chapter 5, such consideration has been made in light of the contextual contingency which is characterised by a non-monetary market where barter and informal exchange play a key role.

The method used to create then the asset index is the PCA which is a method for reducing the dimensionality of a set of correlated continuous variables-A variable that is not restricted to particular values - (Bartholomew et al. 2008:118). The component 1j is then interpreted as a measure of asset index.

Out of 30 assets measured I have selected the 12 assets which were the most meaningful in terms of variance among the observations. For each farmer i , the value of s_j corresponds to the sum of eleven asset scores:

Eleven are categorical, (expressed as categorical binary variables: 1 if owned 0 if not) Gas hittings, fridge, chairs, washing machine, car, tractors, bed, bank account, air conditioner , dvd and sweing machines, bed and one scale, namely number of cows.

Table 1: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.869
	Approx. Chi-Square	582.140
Bartlett's Test of Sphericity	df	78
	Sig.	.000

Table 1 provides the results of the two standard tests used to test the quality of the data in the context of principal component analysis. According to KMO result, the adequacy of the sample size is very good being more than 0.6 (.869) and statistically correlated for the Barlett's test.

The Kaiser-Meyer-Olkin Measure of Sampling Adequacy indicates in fact how large the partial correlations among the variables are. It varies between 0 and 1, and our value of 0.869 is considered as indicative of "strong" common variance (>0.9 would be "very strong"), which is a condition for PCA to be appropriate. In turn, Bartlett's Test of Sphericity is based on the Chi-Square statistic, and the resulting p-value indicates the probability that the variables are in fact uncorrelated (which, again, would render the PCA model inappropriate). In this case, the p-value is 0.000, which means that we may feel secure in the use of PCA.

Table 2: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.077	39.056	39.056	5.077	39.056	39.056
2	1.436	11.048	50.104			
3	1.062	8.168	58.272			
4	.856	6.583	64.855			
5	.801	6.161	71.016			
6	.704	5.414	76.430			
7	.663	5.104	81.533			
8	.636	4.895	86.428			
9	.488	3.753	90.182			
10	.455	3.497	93.679			
11	.345	2.651	96.330			
12	.323	2.481	98.810			
13	.155	1.190	100.000			

Extraction Method: Principal Component Analysis.

Table 2 above expresses that the principal component account for the 39% of the variance in the dataset, in other words that the other components all together account for the 61% of the variance. In this case, observation can be raised whether the component account for all the variance of the asset ownership. However, in this exercise the assumption is that the single factor accounts for the largest share of the variance which in the literature is considered to be acceptable even around 30% (see Filmer and Pritchett, 2001).

Table 3 Component Matrix^a

	Component
	1
fridge	.838
bank account	.829
tractor	.795
car	.790
Chairs	.721
computer laptop	.638
DVD	.616
washing machine	.515
bed	.497
air conditioner	.488
sewing machine	.415
gas hitting	.375
number of cows	.247

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

The component matrix shows the correlation coefficients between the variables and the component (farm assets endowments) .The assets with correspondent coefficients >0.7 are highly correlated with the underlying principal component (Abreu, 2012). In this data set fridge, bank account, tractor, car and chairs are the assets whose variation is mostly explained by farmers' wealth. The other assets, besides cows, sewing machine and gas hitting which have a score of less then .450, are also strongly correlated with household wealth.

		assetPCA		
		Mean	Median	Mode
Type of farm	Wheat F&V farm manager and tomarqua	7.85	7.18	7.13
	farm wage worker	2.40	2.09	.25
	DEKHAN tomarqua	2.50	2.21	.00
	cotton farm manager and tomarqua	7.32	6.89	6.89

Appendix VIII: Principle Component Analysis (PCA) for Input index

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.795
Bartlett's Test of Sphericity	Approx. Chi-Square	262.421
	df	21
	Sig.	.000

The first component contain the 46% of the variation of the variable

component	initial eigenvalues			Extraction Sums of Squared Loadings		
	total	% of variance	cumulative %	Total	% of Variance	Cumulative %
1	3.267	46.668	46.668	3.267	46.668	46.668
2	1.053	15.041	61.709			
3	.818	11.686	73.394			
4	.689	9.838	83.233			
5	.509	7.268	90.501			
6	.405	5.786	96.287			
7	.260	3.713	100.000			

extraction method: principal component analysis.

Seeds and fertilizers have higher loading

Table 3: Component Matrix ^a	
input - SEEDS	.844
input - FERTILIZER	.798
input - WATER	.675
input - CREDIT	.674
input- state TRACTOR	.618
permanent binary	.608
input - EXTENSION SERVICE	.506
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

		inputPCA			
		Mean	Median	Mode	Percentile 25
Type of farm	Wheat F&V farm manager	4.23	3.27	3.44	1.44
	farm wage worker	.23	.39	.39	.00
	DEKHAN tomarqua	.05	.00	.00	.00
	cotton farm manager	3.44	3.09	3.62	1.62

Appendix IX: Principle Component Analysis (PCA) for Output index

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.681
Bartlett's Test of Sphericity	Approx. Chi-Square	153.041
	df	15
	Sig.	.000

The first component contain the 41% of the variation of the variable:

Table 2: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.512	41.868	41.868	2.512	41.868	41.868
2	1.047	17.456	59.324			
3	.905	15.091	74.415			
4	.759	12.647	87.062			
5	.438	7.302	94.364			
6	.338	5.636	100.000			

Extraction Method: Principal Component Analysis.

Table 3: Component Matrix^a

	Component
	1
processing company	.791
wholesale	.782
export	.751
own consumption	-.613
public procurement	.573
- bazar	.077

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

	outputPCA			
	Mean	Median	Mode	Percentile 25
Wheat F&V farm manager	1.13	.83	.83	.83
farm wage worker	-.53	-.54	-.54	-.54
DEKHAN tomarqua	-.54	-.54	-.54	-.54
cotton farm manager	.01	.04	.04	-.04

Appendix X: Principle Component Analysis (PCA) for Individual Dietary Diversity Index

Table1: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.544
	Approx. Chi-Square	199.728
Bartlett's Test of Sphericity	df	91
	Sig.	.000

Table 2: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.368	16.917	16.917	2.368	16.917	16.917
2	1.588	11.342	28.259			
3	1.383	9.879	38.139			
4	1.239	8.847	46.985			
5	1.184	8.455	55.441			
6	1.109	7.922	63.363			
7	.948	6.773	70.136			
8	.797	5.690	75.825			
9	.784	5.598	81.424			
10	.717	5.125	86.548			
11	.564	4.029	90.577			
12	.505	3.607	94.184			
13	.419	2.995	97.179			
14	.395	2.821	100.000			

Extraction Method: Principal Component Analysis.

The cereal and oil have the biggest loading among the 15 variables. However, everything greater than .500 is significant.

Table 3: Component Matrix^a

	Component
	1
CEREALTOT	.635
oilfatToT	.568
pulsenutsTot	.513
milkTot	.504
tubertot	.467
meatot	.464
TOTdarkgreen	.398

sweetstot	.363
vegtot	.357
FISH(vitamin D) baliq	-.341
organic meat (iron rich) - liver/kidney	-.338
vitCfruitstot	.209
vitAfruitstot	.029
Eggs	.008

Extraction Method: Principal Component analysis.

a. 1 component extracted.

		dietPCA			
		Mean	Median	Mode	Percentile 25
Type of farm	Wheat F&V farm manager and tomarqua	5.23	5.06	5.49	4.67
	farm wage worker	3.80	3.98	4.11	3.25
	DEKHAN (tomarqua)	3.64	3.66	2.70	3.00
	cotton farm manager and tomarqua	5.31	5.47	2.87	4.10

Appendix XI: farmers' diet by food type (in percentage)

FOOD TYPES	Wheat F&V farm manager and tomarqua	farm wage worker	DEKHAN tomarqua	cotton farm manager and tomarqua
WHITE TUBERS potato	90	70	93.3	86.7
WHITE TUBERS beetroot	0	0	0.0	13.3
onion	93.3	90	90.0	96.7
CEREALS – rice	83.3	66.7	26.7	76.7
CEREALS - bread	100.0	93.3	100.0	100.0
CEREALS – maize	3.3	3.3	3.3	0.0
CEREALS – buckwheat	3.3	0.0	0.0	3.3
CEREALS – oatmeal	0.0	0.0	0.0	3.3
MEATS, sheep	3.3	6.7	0.0	3.3
MEATS, chicken	6.7	6.7	6.7	3.3
MEATS, goat	0.0	0.0	0.0	6.7
MEATS, beef	86.7	66.7	76.7	83.3
MEATS, lamb	0.0	0.0	0.0	13.3
oil cotton	80.0	73.3	70.0	93.3
oil -sunflower	10.0	3.3	0.0	3.3
oil - butter	40.0	30.0	10.0	33.3
PULSE beans	3.3	6.7	3.3	6.7
Pulse chickpeas	46.7	20.0	36.7	50.0
Pulse lentils	0.0	0.0	0.0	0.0
nuts	0.0	0.0	0.0	3.3
seeds	3.3	0.0	0.0	0.0
DAIRY MILK	43.3	50.0	26.7	60.0
DAIRY CHEESE				
DAIRY PRODUCTS CREAM	6.7	20.0	10.0	10.0
DAIRY Yoghurt	30.0	3.3	3.3	23.3
VITAMIN A VEGETABLES pumpkin	13.3	3.3	10.0	3.3
VITAMIN A VEGETABLES -carrot	93.3	80.0	90.0	86.7
VITAMIN A VEGETABLES - squash	3.3	0.0	0.0	0.0
VITAMIN A RICH VEGETABLES - sweet peppers	20.0	3.3	0.0	6.7
other vegetables - tomato	80.0	33.3	36.7	70.0
other vegetables - cucumber	43.3	16.7	10.0	33.3
other vegetables - aubergine	10.0	0.0	0.0	0.0
other vegetables - mushroom	0.0	0.0	0.0	0.0
other vegetables - zuchini	0.0	0.0	0.0	0.0
DARK GREEN LEAFY VEGETABLES kale	0.0	0.0	0.0	0.0
DARK GREEN LEAFY VEGETABLES spinach	0.0	0.0	6.7	0.0

DARK GREEN LEAFY VEGETABLES cabbage	50.0	40.0	23.3	30.0
DARK GREEN LEAFY VEGETABLES brocoli	0.0	0.0	0.0	0.0
sweets - Sugar	53.3	60.0	53.3	40.0
sweets - Honey	3.3	3.3	0.0	20.0
sweets - chocolates and sweets	3.3	0.0	0.0	10.0
sweets - pops	6.7	0.0	0.0	3.3
cherry	10.0	0.0	0.0	3.3
vitamin A rich fruits - apricot	0.0	0.0	0.0	3.3
vitamin rich fruits- peaches	0.0	0.0	0.0	0.0
vitamin rich fruits - kiwi	0.0	0.0	0.0	0.0
vitamin A rich fruits - grapes	6.7	10.0	16.7	10.0
vitamin rich fruits - plums	3.3	0.0	0.0	0.0
OTHER FRUITS (vitamin C) - apple	33.3	36.7	66.7	60.0
OTHER FRUITS (vitamin C) - lemon oranges	13.3	0.0	3.3	6.7
OTHER FRUITS (vitamin C) banana	6.7	0.0	0.0	0.0
OTHER FRUITS (vitamin C) watermelon	20.0	6.7	0.0	13.3
OTHER FRUITS (vitamin C) berries	0.0	0.0	0.0	0.0
vitamin C rich fruits - melon	23.3	0.0	6.7	16.7
Alcohol	10.0	0.0	0.0	20.0
organic meat flesh	3.3	6.7	0.0	3.3
Fish	10.0	3.3	3.3	6.7
Eggs	40.0	20.0	20.0	23.3

Appendix XII: Additional correlations

Correlation asset index and input

		assetPCA	inputPCA
assetPCA	Pearson Correlation	1	.490**
	Sig. (2-tailed)		.000
	N	120	120
inputPCA	Pearson Correlation	.490**	1
	Sig. (2-tailed)	.000	
	N	120	120

** . Correlation is significant at the 0.01 level (2-tailed).

Correlation inputs and output index

		inputPCA	outputPCA
inputPCA	Pearson Correlation	1	.476**
	Sig. (2-tailed)		.000
	N	120	120
outputPCA	Pearson Correlation	.476**	1
	Sig. (2-tailed)	.000	
	N	120	120

** . Correlation is significant at the 0.01 level (2-tailed).

<u>Correlation asset index and output index</u>		outputPCA	assetPCA
outputPCA	Pearson Correlation	1	.652**
	Sig. (2-tailed)		.000
	N	120	120
assetPCA	Pearson Correlation	.652**	1
	Sig. (2-tailed)	.000	
	N	120	120

** . Correlation is significant at the 0.01 level (2-tailed).

<u>Correlation asset index and output inputs index</u>		assetPCA	outputinputPCA
assetPCA	Pearson Correlation	1	.583**
	Sig. (2-tailed)		.000
	N	120	120
outputinputPCA	Pearson Correlation	.583**	1
	Sig. (2-tailed)	.000	
	N	120	120

** . Correlation is significant at the 0.01 level (2-tailed).

Appendix XIII: PhD Timeline	Year 1												Year 2												Year 3-4											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12-15
Political and economic desk review of the context of the proposed research: finding the research question.	█	█	█	█	█	█																														
research literature review	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Review of nutrition-cash crops friction and labour time use	█	█	█	█	█	█	█	█	█	█	█																									
Analysis of the commercialisation process in Post Soviet countries	█	█	█	█	█	█	█	█	█	█	█																									
Conceptual framework and contact with fieldwork partners				█	█	█	█	█																												
Plan, methodology preparation and first fieldwork mission							█	█	█	█	█	█	█	█	█																					
fieldwork													█	█	█	█																				
Answering research questions																									█	█	█	█	█	█	█	█	█	█	█	█
Searching for determinants of Hypothesis to test																																				

