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of the United Nations**

**Zambia cassava sector policy: recommendations
in support of strategy implementation**

Nigel Poole

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Disclaimer

The views expressed in this working paper are those of the author and do not necessarily reflect those of the Food and Agriculture Organization of the United Nations or other participating organisations.

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1 Scope and purpose

The objective of this paper is to provide a series of recommendations to the Food and Agriculture Organization of the UN and other interested policy makers in support of the cassava sector strategy development process in Zambia, aimed at a) ensuring smallholder participation in the implementation of activities identified in the strategies, and b) for potential incorporation into sector development plans. It draws on the literature, participation in workshops and field visits in Zambia and Rome (2009-10), small-scale field research in Chongwe District, Lusaka Province (February-April 2010), and reflections on the final draft of the strategy document resulting from work in Zambia under the EU-funded All ACP Agricultural Commodities Programme.

The cassava strategy is close to the frontier of development practice, and implementation plans will require considerable further careful design in Zambia based on detailed contextual knowledge. It is not within the author's competence, nor is it the intention, to pass judgement on the nature and feasibility of every sub-objective and activity, but to provide a commentary, or in other words to hold up a 'mirror' to view and review the strategy particularly in respect of smallholder participation. It will also highlight further work which is required to fill knowledge gaps and to develop the detail of the implementation plan, feasible targets and timescales.

After some introductory comments on the strategy, section 2 outlines the process of cassava sector strategy development and the objectives, and summarises significant challenges for implementation. Section 3 reviews the national context of cassava production and the potential contribution to the Zambian economy. It includes comments on market trends and the challenges for increasing commercialisation.

Section 4 is the longest: it explores the fundamental question of the propensity of smallholders to deliver the increased volumes envisaged in the strategy. Although drawing on insights from comparative experience and from some limited primary research, it is not intended as a definitive statement. On the evidence available, it evaluates the commercial orientation of smallholder producers and draws attention to rural heterogeneity and the likelihood of a differential supply response. Then it highlights aspects of the supply chain linkages that are critical for smallholder inclusion. One important element is the interrelationship between cassava policy and maize policy which influences the incentives for producers and processors alike to engage in the cassava sector. Comments then follow on the organisation and coordination of the sector, on some technical issues and the role of finance in affecting the response of producers, and on current knowledge gaps.

The final section 5 contains concluding comments: a summary view of the strategy, gaps which require further clarification and development, and knowledge barriers that must be overcome in order to enhance implementation.

1.1 Introductory comments on the strategy

Among the arable possibilities, cassava has considerable potential in Zambia as a crop for diversifying farm production, increasing rural food security at the producer household level, as an input into the processed food markets for human consumption, and as an input for domestic industrial development and export markets.

This commentary strongly endorses the argument that 'cassava has the potential to contribute to the achievement of substantial social and economic development opportunities in Zambia' (All ACP Agricultural Commodities Programme 2010: 47). The strategy has been designed to be consistent with Fifth National Development Plan for the period 2006 to 2010, the Ministry of Agriculture and Co-operative's National Agricultural Policy for the period 2004 to 2015, and as an input for the development of the Sixth National Development Plan for 2011-2015. The objectives have been linked to Zambia's Millennium Development Goal Strategy (Annex 1), and the strategy is aligned with the CAADP framework and priorities (All ACP Agricultural Commodities Programme 2010: 33).

The multistakeholder process whereby the strategy has been developed is a significant methodological initiative in development policy design, and to be welcomed and replicated where appropriate.

The strategy has six broad objectives which address the current weaknesses of the sector and target the development potential. Major increases in cassava production in the short-to-medium term are envisaged to supply the potential national and regional market demand.

A key element of the strategy is for activities to be commercially driven. At the same time, the strategy implies sourcing financial resources from outside the sector to be mobilised through leading institutions. Among these the national public sector and a cassava sector coordinating body are strongly represented. Potential implementing partners include a strong representation from national organisations and international donors. The strategy does not identify specific sources of funding.

While the overall financial costings are modest compared to past and current development activities (All ACP Agricultural Commodities Programme 2010: Annex 2), human and other needed resources among leading institutions and potential implementing partners are not specified. Sectoral coordination challenges and interagency coordination costs are likely to be significant.

Implementation has much to do with assigning roles and responsibilities. While some basic principles about the appropriate roles of different sectors have been discussed (Poulton, C. 2009), particular attention should be paid to a number of issues arising throughout:

- The scope and timescale of the strategy
- The potential supply response by farmers
- The potential of horizontal producer-level organisation
- Sectoral vertical organisation
- Financial delivery mechanisms
- Interactions with maize support policy
- The need for further analytical work.

2 Zambia cassava sector strategy development

2.1 The process

The cassava sector in Zambia was identified within the All ACP Agricultural Commodities Programme (with funding from the European Union) at a programme kick-off workshop held in Dar-es-Salaam, Tanzania in June 2008. With substantial endorsement from the Zambian public sector, the vision is to develop a viable cassava industry contributing to wealth creation and food security for improved livelihoods by 2015, at the same time making an effective and coherent contribution towards achieving the Millennium Development Goals.

The multistakeholder forum for strategy formulation

With the support of external organisations such as ITC and FAO, the local stakeholders have formed a remarkable group comprising producers, processors and manufacturers, finance agents, supported by a range of public sector bodies, donors and NGOs. The realisation of the strategy will be enhanced by private sector leadership. GoZ, especially MACO, MCTI and the Zambia Development Agency (ZDA), have demonstrated significant political commitment. Moving towards implementation, there are challenges for both continuity and adequate participation and subsector representation: grassroots involvement from producers and small-scale traders is critical to enhance knowledge of and communication within supply systems. The creation of awareness of business opportunities within the banking and legal sectors, with formulation of innovative financial and organisational arrangements will increase the rate of sector growth.

2.2 The strategy

The strategy is built around 6 key objectives identified through a participatory multistakeholder process of chain diagnosis and strategy development:

- Objective 1: Improve information flow and knowledge management for enhanced decision making
- Objective 2: Improve access to finance to 80% of sector stakeholders by 2015 and ensure necessary funding for the implementation of the strategy
- Objective 3: Build capacity to improve value chain performance and sustainability in responding to the projected demand of 4 Mt by 2015
- Objective 4: Enable strategy implementation by establishing a platform for private public dialogue by 2011
- Objective 5: Improve linkages within the value chain and increase global production, processing and commercialization to respond to a demand of 4 million Mt by 2015
- Objective 6: Strengthen research and development and extension services in order to respond to demand of 4 million Mt by 2015.

2.3 Objectives

Within these broad objectives, 21 sub-objectives have been identified with suggested timescales, each with multiple activities, beneficiaries, leading institutions, potential implementing partners, resources needed, progress indicators and costings. The major

activities are to take place within the first three years of the implementation period 2010-2015.

The total sum envisaged is just over US\$13 million, made up of 83 activities and different budget lines ranging from:

- \$1000 (identification of people to be trained as trainers from relevant institutions (farmers' associations, processors' associations and NGOs), to:
- \$750000 (promotion of participatory approach and integrated crop management models, to improve farmers' knowledge and skills about high technology for cassava production) to:
- \$2.5 million (conduct feasibility studies for the Agro-Business Centres, develop business plans, establish Centres, define roles and services...)

2.4 Moving towards implementation

It is an exceedingly complex undertaking to address the needs of a national sector. The process of strategy development has been novel and participative, and is a remarkable achievement. A participative process of this nature inevitably will face challenges when moving from the consultative design stage through to the planning and devolution of responsibilities and budgets. The outcome is 'bureaucratic' in the sense that it is a thorough identification and analysis of needs and subsequent assignment of responsibilities to multiple players throughout the sector.

Sector needs have been precisely identified and addressed in the 6 objectives. There is a thorough analysis of strengths, weaknesses and opportunities, and the recommended activities are clearly defined throughout the value chain. However, there is potential duplication among the 83 activities (eg activities 3.33 and 3.75, together costing US\$1.05 million).

Design

Improving access to finance is identified as the 'fuel' for driving development of the sector. The balance of initiative between mobilising private sector resources and seeking donor resources is not resolved. Costings are modest compared to previous and current projects (All ACP Agricultural Commodities Programme 2010: Annex 2), but it is not clear if the total costing is a budget for grants from donors, or whether it is a target for industrial funding, or lending by donors – or most likely a balance between different sources and funding modalities. Happily it is expected that donors are willing to support the strategy. However, currently the processing and manufacturing sector is unwilling and risk averse: 'cassava is not yet categorized as a viable sector from a business point of view' (All ACP Agricultural Commodities Programme 2010: 21).

Monitoring activities (4.11-4.15) and engagement with policy makers (4.31-4.34) through a public-private dialogue are significant and welcome inclusions.

Rebalancing policy support for cassava vis-à-vis maize is a critical element in promoting cassava uptake and substitution for maize by industry.

Objective 5 is the core component of the strategy, to *improve linkages within the value chain and increase global production, processing and commercialization to respond to a demand of 4 million Mt by 2015*. Two sub-objectives are to:

- pilot commercially driven collection and distribution centres for cassava to increase volume, quality and consistency of supply, and
- encourage agro-processing of cassava.

Certain details of the plan are novel. For example, the strategy acknowledges that the model, scope and services of agribusiness centres are as yet undefined.

- Agribusiness centres (mainly sub-objectives 5.11-5.23) are an undeveloped and unproven model (costings = US\$3.05 million) to achieve the aims, inter alia, ‘to bulk supply and demand, collect from farmgate and deliver to market with the necessary quantity at the right quality and in a consistent manner’ (All ACP Agricultural Commodities Programme 2010: 71). Other functions are cited throughout the strategy. In the past, state and collective organisations have attempted to fulfil these functions with limited success (Poole, N.D. and de Frece, A. 2010). Creation of new commercial rural enterprises is problematic and requires a long term perspective (Donovan, J., Stoian, D. and Poole, N.D. 2008). The sub-objective to ‘Pilot commercially driven collection and distribution centers for cassava to increase volume, quality and consistency of supply’ is one that needs much further analysis.

While some basic principles about the appropriate roles of different sectors have been deduced (Poulton, C. 2009), the strategy is close to the forefront of development practice, and implementation plans will require further careful design based on detailed contextual knowledge. This should include an awareness of the existing agricultural marketing environment, the role of small traders, the recognition that the new agribusiness centres are likely to be only one of a diversity of channels whereby farmers can access the market, and the desirability of competitive pressures from alternative contractual arrangements.

Implementation

The Implementing Framework suggests certain structures but detail needs to be further provided about the participation of individuals, institutions and mechanisms to link the actions of the multiple players.

In addition, threats to implementation need to be clearly identified and addressed.

- The targets are demanding
- The time frame and projected cassava output increase are ambitious
- Human resources requirements are challenging:
 - It is a new type of development initiative without precedent
 - There are limited human skills and experience in Zambia – and anywhere – for such a scale of development enterprise

- The role, composition, resource base and capacity of the Coordinating Committee and of other leading institutions such as MACO needs to be diagnosed.

Coordination and consistency

The multiple agency involvement requires high levels of management skill and coordination among donors and among implementing organisations. This complexity has been recognised throughout the process: ‘it is important to bear in mind that one of the major challenges highlighted by the value chain actors was the coordination among development partners and the capitalization of synergies whenever programmes were designed with similar components’ (All ACP Agricultural Commodities Programme 2010: 29). Structures and mechanisms are outlined in the Implementation Framework (pp. 25 and 82-4) but these are rudimentary. Further work is needed to bring together donors, potential investors, leading institutions and potential implementing partners leading to a clear assignment of responsibilities. Coordination is required at multiple levels including among the international donors to whom the strategy will be referred.

In the following sections the challenges outlined above are discussed in the context of the Zambian cassava sector and a series of suggestions and recommendations that could be kept in mind as the strategy moves from design to implementation are spelt out

3 Context

3.1 Cassava in the Zambian agricultural economy

Agronomic potential

The cassava sector development strategy has been welcomed by the President of Zambia and other public sector leaders including the Ministries of Agriculture and Cooperatives (MACO) and Commerce, Trade and Industry (MCTI). It is consistent with the report of a recent study by the World Bank on the prospects for commercial agriculture in certain regions of Africa:

‘Zambia ... has considerable agricultural potential, but this potential remains largely unexploited. Of the country’s total land area of around 754,000 square kilometers, approximately 79 percent can be characterized as Guinea Savannah. Of the land considered arable, nearly 420,000 square kilometers are classified as having medium-to-high potential for agriculture, but only about 15 percent of the medium-to-high-potential arable land is currently being utilized, and of this, fewer than 7,000 square kilometers lie in the Guinea Savannah. The population density in most of the productive regions is still very low, ranging from 1 to 11 people per square kilometer. Rainfall ranges between 800 and 1,400 millimeters annually, increasing from south to north. The northern regions receive ample rainfall and are quite sparsely populated. The southern regions are much dryer and suffer from frequent drought. It is here that livestock production is most prevalent. On the plateaus around Lusaka, Livingstone, Kabwe, and Chipata, soils are generally fertile, and rainfall is sufficient to support production of a wide range of crops. Further north, the soils are naturally less productive, but their lack of fertility could be overcome with small investments in fertilizer and lime.’ Source: World Bank (2009).

3.2 Market trends

Supply and demand

Cassava has been growing in importance in Zambia since the era of market liberalisation in the 1990s when support for maize was reduced, as part of a trend towards agricultural diversification (Dorosh, P., Dradri, S. and Haggblade, S. 2009; Govereh, J., Chapoto, A. and Jayne, T.S. 2010). As a staple food crop it is second only in importance to maize, accounting for roughly 15% of national calorie consumption (Simwambana, M. 2005; Barratt, N., Chitundu, D., Dover, O., Elsinga, J., Eriksson, S., Guma, L., Haggblade, M., Haggblade, S., Henn, T.O., Locke, F.R., O'Donnell, C., Smith, C. and Stevens, T. 2006; Dorosh, P. *et al.* 2009). An estimated thirty percent of Zambians - about 4 million people - consume cassava as part of their diet. The majority of these consumers live in the northern part of the country covering Northern, Luapula, Copperbelt, Northwestern and Western Provinces, which are also the main growing areas. Production is almost entirely by smallholder farmers whose average cultivated area is less than 1 hectare. Demand for cassava for both human and industrial consumption has also grown in the urban and industrial centres of Lusaka and Copperbelt provinces. Cassava production has steadily increased from 190,000 MT in 1970 to 640,000 MT in 1990 and about 1.1 million MT in 2007 (Food and Agriculture Organization 2010).

Consumption

The evidence from the literature (eg Chitundu *et al.* (2009); Barratt *et al.* (2006)) and recent small-scale research including the study conducted by Cadoni (2010) confirms that cassava production using traditional, and increasingly improved varieties, currently contributes significantly to food security in the northern and western cassava belt (Luapula, Northern and Western Provinces); according to Chitundu *et al.*, 'in northern Zambia, where drought-tolerant cassava serves as the principal food staple, food aid appeals are rare' (2009). Following sustained interest by GoZ, donors and NGOs in the development and dissemination of improved varieties, there is evidence that cassava is increasingly appreciated within the non-traditional cassava-growing southern and eastern maize belt for its drought tolerance and contribution to food security (Poole, N.D., Chitundu, M., Msoni, R. and Tembo, I. 2010).

Domestic market systems

Domestic market systems currently are rudimentary: major production locations in the north are distant from some important potential buyers, for example around Lusaka and to some extent the Copperbelt also. Producers and potential buyers alike face considerable transaction and transport costs. In other potential supply areas – within the maize belt - the scale of production is small and the level of technical efficiency is low and support services are limited. The intermediary functions requiring transport and processing infrastructure are also undeveloped.

Prices of fresh product of the desired 'sweet' improved varieties are high compared with subsidised maize for human consumption and for industrial processing. Much of the market deficit is attributable to potential domestic demand from Tiger Animal Feeds and other processor-manufacturers. Commercialisation of the sector can only be achieved if significant

increases are made in developing a reliable, competitive supply of product to a better developed market system of traders, processors and manufacturers.

Exports

Estimates exist of significant domestic (and export) markets for cassava products. Cassava has potential as a substitute for maize as an ingredient for human food products and animal feed, but cassava is not currently competitive as an input to these products/markets. This is partly due to unbalanced policies for cassava and maize. Potential also exists for other industrial purposes which require starch and ethanol. Effective demand is currently limited, and research, product development and communication to potential users and to the finance sector are necessary to leverage resources and realise the market potential, and signal to producers and intermediaries what, where and how much to produce.

3.3 Commercialisation challenges

The strategy document recognises various weaknesses in the cassava value chain. From the supply side, lack of sufficient production of the right quality and consistency is one key factor (All ACP Agricultural Commodities Programme 2010: 21); on the demand side, aversion to investment in cassava characterises the processing and financial sectors (All ACP Agricultural Commodities Programme 2010: 22). The role of cassava as a subsistence and food safety crop is also recognised. As the strategy document comments: 'The key question is: if there is no perceived market or demand... why would farmers produce cassava other than for self-consumption?' (All ACP Agricultural Commodities Programme 2010: 22). This is indeed the key question that is raised in section 4.

Marketable surplus

While cassava production contributes to a certain degree to cash incomes, marketable quantities remain low. The projected increases in output and utilisation involve huge challenges within a short space of time in respect of raw material production, processing, manufacturing, human and financial capacity building, knowledge generation and management:

- according to FAO, total production of raw cassava in 2007 was 1.1 million MT (Food and Agriculture Organization 2010)
- from a marketed surplus of 170000 MT in 2009, a threefold increase to 533630 MT marketed raw cassava is anticipated by 2012 to meet domestic industrial demand and export of dry chips to the Great Lakes region
- a fifteen-fold increase to almost 2.7 million MT marketed raw cassava is projected to meet demand by 2015, mostly for processing and substitution of maize flour (All ACP Agricultural Commodities Programme 2010: 49-51)
- 'Altogether, the targeted quantities per year for 2015 sum up to approximately 4 million MT of raw cassava...' (All ACP Agricultural Commodities Programme 2010: 51).

Increasing output

The Strategy recognises two principal sources of increase in output, which are, respectively, to increase the area of land devoted to cassava production, and to raise productivity. As

noted, Zambia has considerable unexploited natural resources and agricultural potential (World Bank 2009), and access to improved varieties of higher agronomic potential (Simwambana, M. 2005). Increasing effective access by farmers to new land and to improved planting materials are key supply-side requirements. Increasing irrigation, better research and extension linkages, better agricultural production and storage practices and above all, access to finance, are specific constraints which have been identified (All ACP Agricultural Commodities Programme 2010: 41-4).

The major unknown is what are the chances that the supply side can deliver the increased output in the near future? This commentary moves on to consider the specific issues associated with smallholder participation in the cassava sector strategy.

4 Smallholder participation: analysis and recommendations

Currently there is not enough evidence available yet to guide policy and to make precise recommendations about how to ensure effective implementation of many of the activities envisaged in the strategy, or the extent to which even well designed activities will be successful. This is particularly relevant to the smallholder supply response. The supply side unknown includes many sub-questions which need further analysis. Resolving these questions requires contextual understanding but also new knowledge about smallholder farmer behaviour:

- What is the smallholder farmers' propensity to grow cassava to enhance food security and to supply agroindustrial demand (Poole, N.D. et al. 2010)?
- Whose should be the responsibility for production and distribution of improved varietal growing materials, and the delivery of agricultural extension and business development services (All ACP Agricultural Commodities Programme 2010: 41-4)?
- What mechanisms can be put in place to achieve representation from smallholder farmers and small-scale traders in sectoral organisation, planning and decision making (Poole, N.D. and de Frece, A. 2010)?
- What are the most likely mechanisms for promoting horizontal producer organisation and representation?
 - Should activities build on existing or create new organisations?
 - What lessons are there from other experience concerning the likely effectiveness of the multiple roles envisaged for the agribusiness centres (All ACP Agricultural Commodities Programme 2010: 71-2 and elsewhere)?
- Should small-scale traders be included in the strategy - or are they economically inefficient and socially undesirable (KIT and IIRR 2008)?
- What are the additional data requirements for accurate policy formulation to boost the sector?

There are also important issues for FAO related to the appropriate allocation of roles and responsibilities between sectoral stakeholders and the diverse public and private players.

Considerations for financing the sector investment will also be of concern to FAO. Novel mechanisms will be required for leveraging private capital investment for processing at the household level and intermediate (small-scale industrial processors and manufacturers) level, as well as improved financing for larger industrial processors and manufacturers. Innovation in financial service delivery can be achieved by participatory action research.

The following section is a broad discussion intended to uncover issues and constraints that will influence the likelihood of smallholder inclusion in commercial cassava, and therefore the success of the overall strategy.

4.1 Commercial orientation

In general, it can be asserted that, *ceteris paribus*, farmers are likely to adapt patterns of production in accordance with new opportunities. Govereh et al (2010) have argued that the adoption of cassava as a food crop by smallholders in the north and west of Zambia was favoured or promoted by policy changes affecting the maize market: a reduction in support reduced the attractiveness of maize vis-à-vis alternative production systems, resulting in a process of agricultural diversification that included cassava production. The concurrent promotion of the sector through research, development and dissemination of new varieties was timely and the effects of these sector programmes are being felt in regions beyond the cassava belt. The agronomic potential of improved varieties has been demonstrated and varieties have been disseminated by diverse organisations and adopted by smallholders (Barratt, N. *et al.* 2006; Poole, N.D., Chitundu, M., Msoni, R. and Tembo, I. 2010). Further growth in cassava can be expected as technological development and dissemination proceeds (Nweke, F., Haggblade, S. and Zulu, B. 2004). The strategy envisages a massive supply response from a host of small-scale producers who grow small quantities primarily for on-farm consumption, with demand signals and product marketing effected through a traditional market system which manifests almost no characteristics of modern supply chain management. Likewise, a massive demand response is expected from the agrifood processing and manufacturing industry.

While the cassava strategy was being finalised, FAO funded small-scale research into the supply side questions. A case study assessment was undertaken of the extent to, and mechanisms through which, smallholder participation in the development of the cassava value chain in Zambia can be assured. Using livelihoods concepts, *inter alia*, the smallholder production patterns and recent interventions by the state and by NGOs and initiatives by the private sector were assessed (Poole, N.D. *et al.* 2010). It is evident that smallholder participation in the cassava value chain will depend not only on the market and policy incentives which they face but also the specific constraints internal and external to the household or productive unit. The attractiveness of the incentives is a function both of policy and organisations, and of the institutional and donor environments. The entrepreneurial predisposition of Zambian smallholders is not in question, but the effective capacity to respond to opportunities and initiatives depends, *inter alia*, on human assets and attitudes:

‘... a shift towards a stronger market orientation among producers will involve a major change of attitude and practice. Changing production patterns would not be a new phenomenon, but stimulating surplus production for the market probably will require major incentives and the provision of complementary services: technical

skills and inputs, managerial training, business and marketing skills, finance, plus logistics and communications technologies. With the current state of knowledge, it cannot be predicted with certainty what will be the most effective intervention mechanisms nor what outcomes will emerge from changing the set of opportunities and constraints.

Furthermore, predicting grower behaviour requires caution for two reasons: firstly the sample used here is small, and is unlikely to be representative; and secondly, even within this small sample, there is a distinctive heterogeneity among farmers. It is surprising to note that – perhaps counter-intuitively - this heterogeneity is not primarily associated with socioeconomic and demographic characteristics and the level and thresholds of livelihood assets such as physical, natural, social, human and financial capitals. Results suggest that the growers of improved varieties are like classical ‘early adopters’: more innovative and more dedicated to farming as an occupation. Non-growers, however, are not necessarily ‘laggards’ but demonstrate characteristics of rural people who are not necessarily committed to agriculture. For whatever reasons – and lack of labour is a contributory factor – they are more integrated into an urban type of economy of paid employment, more credit and loans, lower food (maize) self-sufficiency, lower level of involvement in community and marketing organisations. It is possible to infer that structural characteristics and barriers to entry seem to be relatively unimportant: assets and thresholds play a minor role compared to questions of individual attitudes and personal or family orientation. Further research is necessary to understand the phenomenon of rural heterogeneity before appropriate intervention targeting is possible.’ (Poole, N.D. *et al.* 2010: 14)

While growing conditions for expanding cassava output in the northern and western regions to meet industrial demand are satisfied, transport costs to sites of industrial transformation must be addressed. This requires upgrading of roads and competitive transport systems. Moreover, in production areas, concentration of supplies and quality control through group marketing is necessary for reducing transaction costs of buyers and increasing the competitiveness of cassava. Similarly, investment in local processing units and the necessary power and water supplies, which could be small-scale community or group-based enterprises, will create employment. Co-investments strategies in production – supported by the public sector and NGOs - and marketing – led by the private sector can lead to coordination efficiencies. For example, high levels of efficiency of the market system could also be achieved by the relocation of major processing towards the major production areas. It is possible that current multilateral rural infrastructure (energy and roads) projects can be oriented towards the cassava sector to facilitate smallholder participation in cassava commercialisation (processing and transport).

4.2 Rural heterogeneity

Household characteristics

The strategy document acknowledges that the farming population of Zambia is heterogeneous. Understanding rural heterogeneity and developing an appropriate (efficient and ethical) targeting strategy is essential for developing the supply side. Cassava production

is not spread evenly throughout Zambia. Production is concentrated in the northern and western cassava belt (Luapula, Northern and Western Provinces). Zambia can be divided in three different zones where different cassava versus maize production patterns can be observed (Govereh, J. *et al.* 2010):

- The maize belt (including Agro ecological zones 1 and 2a, the south and along the regions at the border with Zimbabwe and Mozambique), where over 75% of households' grow maize and less than 25% (in fact less than 10%) grow cassava
- The dual staple zone (including agro-ecological zones 2b and 3a the Northern regions of the country), where over 50% of households grow cassava and maize
- The cassava belt (including Agro ecological zone 3b, the northern and northwest corners of AEZ3), where over 90% of households grow cassava, cassava commercialization is most highly developed and cassava prices are lowest.

Differentiation in commercialisation patterns can also be observed. It is reported that on average, only 8–10% of cassava harvested is marketed (Haggblade, S. and Nyembe, M. 2008), but significant differences are found in proportions marketed across household types and by district. About 25% of cassava-growing farmers sell a portion of their cassava crop, but that share changes across zones. Farmers in the maize belt who grow cassava tend to consider cassava not only as a food staple but also as a cash crop. They sell about 10% of their cassava production mostly to the fresh market. This represents a higher marketed share than for maize. In comparison, households in the cassava-producing zone sell only about 7% of their cassava production, on average, three-quarters of it in dried form and the remainder in the local fresh market.

Certain production data are available from the Agricultural Household Survey 2008/09, conducted by the Zambian Central Statistics Office (CSO). Detailed household-level data on production do not exist, but small-scale survey work at the household level suggests that most production is small-scale: in two Districts (Samfya and Mansa) in Luapula Province, Cadoni (2010) found mean cassava areas of 2.6ha and 1.5ha respectively (excluding extreme values).

Chongwe District in the maize belt was targeted for the FAO-funded research into producer characteristics (Poole, N.D. *et al.* 2010) in early 2010 because the region is not typically cassava growing, has a diverse population, and is the sort of region outside the cassava belt and within reasonable proximity of processing and consumption centres to serve as an evaluation of constraints and opportunities for expanding cassava production among smallholders.

In Chongwe, among a stratified random sample of 116 farming households, of whom 88 were growers of either traditional or new varieties, Poole *et al.* (2010) found considerable variation in production structures, especially in relation to cassava production:

- mean farm size - 1.9ha (sd 1.2)
- mean maize area – 1.2ha (sd 0.8)

- mean cassava area – 0.4ha (sd 0.7).

Cassava has been cultivated by some growers in Chongwe since the 1990s, while many growers only adopted cassava in 2007-08. Overall, cropping patterns are diverse, with maize as a principal crop, and cassava as one of a range of additional crops which include groundnuts and sweet potatoes. Households are not involved in full-time arable farming. Households also keep livestock and have other sources of income from off-farm employment, non-farming enterprises and remittances.

While household responses to production interventions and incentives will vary with household circumstances, public sector interventions and private sector initiatives have to take into account the marked regional differentiation of both production and utilisation/consumption. The levels of human and natural assets for cassava production are favourable in the north and west, but remoteness from major markets imposes market information and transport infrastructure requirements. Elsewhere, while available data are limited, the development of new production capacity to meet potential demand will require investment in human capacity building: multiplication and distribution of planting materials, agricultural extension and organisational capacity building.

Determinants of market participation

Rural heterogeneity is an important consideration for targeting interventions and for estimating a supply response, even if it is not possible to assign cause and effect relationships between socio-economic variables and cassava production and marketing. In Chongwe District, not only was there considerable heterogeneity among growers, but considerable dynamism was evident: 65% of growers had increased the area planted to cassava over the past five years, and 21% had reduced the area grown (Poole, N.D. *et al.* 2010). This suggests that farmers' strategies are responsive to incentives and outcomes.

The principal benefit from growing cassava was improved food security. Only a subgroup was willing or able to engage in commercialisation of cassava, either fresh or processed, and the frequency of sales per annum was very low. Of those who were engaged in processing and marketing, the cash benefits were attractive but small income supplements to enable occasional purchases, but overall contributed only a little to the annual household economy, and almost nothing to investment in longer term assets.

It is worth noting here that the potential is limited to turn a current annual market deficit of 100000 tonnes into a commercialised volume of 4 million tonnes in a four or five year period. Growth and development of the production sector is likely to take longer than envisaged in the strategy targets because of the constraints to the expansion of primary production, as well as the need to develop the whole downstream value chain.

Constraints to adoption of cassava production

In the survey, barriers to entry were found to be limited (Poole, N.D. *et al.* 2010): the District is land-abundant. The principal constraints to participation were that interventions such as the distribution of planting materials and training in production and processing techniques, and in organisation and group management, were not widely available, or through targeted interventions (such as gender-based programmes) effectively excluded some growers. The non-availability of planting materials to non-beneficiaries of interventions were noted,

especially of improved varieties resistant to cassava mosaic virus, but were generally rated by growers as only slight problems.

For the Chongwe sample, labour constraints were cited by a small minority (about 10%), and among the growers who had withdrawn from cassava production, disease and competition from livestock were cited as significant reasons. Increased risks from exposure to weather and production risks and market risks were considered to be of little importance. Barriers to markets were also not rated as significant: most grower-sellers of cassava lived further from roads and markets than those who did not engage in commercialisation, and managed the physical access to markets without major difficulty. However, the quantities and frequency of sales were low in this type of farming, and the weaknesses in production and marketing infrastructure are likely to become more significant if the level of production in such areas increases to meet the supply aspirations of the sector strategy.

Production propensity and rural heterogeneity

On the basis of this study, it seems that fundamental socio-economic asset and infrastructure thresholds, other than on-farm labour, are unlikely to influence the supply response. Attitudes rather than assets may be significant factors in the adoption of cassava, especially improved varieties, and its commercialisation. However, this conclusion is surprising and should not be generalised without further study.

The results of this exploratory work suggest that non-growers of cassava resembled growers in the socio-economic fundamentals of household structure, gender, and assets such as provision of electricity, potable water, irrigation and access to credit. It is likely that unobservable characteristics such as personal attitudes and aptitudes of rural people, rather than more measurable socio-economic asset thresholds, will influence household propensity to adopt cassava production for commercial purposes. An hypothesis that emerged is that non-growers were integrated to a greater degree – either by choice or compulsion – in the cash economy, for example a lower level of maize self-sufficiency, having greater reliance on employment and having more outstanding credit – and to a lesser degree in community and agricultural marketing organisations. A potential predisposition against farming among some rural households is possible, therefore, and the expected supply response to interventions and initiatives is likely to be heterogeneous.

‘Much more needs to be understood about the smallholder cassava farming sector. The limitations of this research have already been acknowledged. It is known that significant differences exist between the traditional growing regions of Luapula, Western, Northern Provinces and the non-traditional growing regions eg around Lusaka in respect of a range of important factors:

- cassava production
- agricultural productivity
- markets, marketing and marketers
- knowledge, information, communications and logistics
- consumption patterns.

‘Consideration should be given to exploring secondary data: it is assumed that there are national farm household survey data within Zambia that will enable researchers and

stakeholders to address some of our basic questions about smallholder potential. Given such baseline resources, primary data collection can be directed to other areas of Zambia to enable the generalisations and policy formulation at which this report can only hint:

- participation in the process of strategy development and implementation
- propensity of smallholders to respond to sectoral initiatives
- smallholder-level organisation to meet the demands of commercialisation
- possible financial mechanisms.

‘Attitudinal issues, and what have come to be referred to as ‘unobservables’, which are not normally captured in socioeconomic research need further investigation, probably through qualitative approaches. Besides household socioeconomic data such as resources or livelihood assets and the external opportunity and constraint set, more knowledge is needed concerning personal attitudes, aptitudes and attributes which may be important in determining farmers’ responses to new incentives (Poole, N.D. 2000). Fundamentally, do farmers want to grow cassava? At whom should interventions be targeted?’ (Poole, N.D. *et al.* 2010: 20-1).

Therefore, more than basic socioeconomic variables, behavioural characteristics would serve as indicators of a propensity to commercial agriculture. These characteristics are factors such as willingness to invest, or specifically to take loans to increase production, to improve productivity through better agricultural practices, and to develop a local processing capacity. However, this process would be likely to exclude the poorest producers who not only will have fewer opportunities but are also likely to face other constraints. It is the targeting of interventions that is likely to influence the outcomes of development initiatives in the cassava sector. At the same time, consideration needs to be given to the ethical issues associated with the targeting of interventions, which is normally justified by economic criteria rather than other moral criteria. This topic is very much under-researched.

4.3 Intersectoral and supply chain linkages

Inferences that can be reliably drawn are that significant investment is needed in capacity building among producers in order to respond to favourable market signals. Basic extension services are needed to address the lack of planting materials of the appropriate varieties, and the limited skills in new production practices. Supporting investments are needed in technologies and services such as mechanisation for the large expansion of farm scale to meet the projected demand. Concentration of supply through local bulking is essential to reduce transaction costs and the transport costs faced by external logistics players.

Supply chain linkages need to be formed with buyers to ensure reliable and timely delivery of adequate volumes of the right quality and variety of cassava. Local producer group organisation is one effective means which will also require the development and extension of appropriate organisational models, as well as investment in group organisation and management skills. Local group organisation is common, but once again there are real challenges in creating an efficient and sustainable collective enterprise sector.

Role of small-scale traders

As noted, development of the value chain requires not only increased output but a massive increase in marketing capacity: bulking currently depends on small-scale entrepreneurship, and transport facilities in respect of roads and carrying capacity are again limited. An important issue not tackled in studies to date is the role of local traders and their potential to link producers and markets both economically and physically. It is both the exchange function in linking markets and also the transport and information functions that are as yet poorly understood.

Competing channels

Production for household consumption is currently estimated to account for 85-90% of all fresh cassava utilisation. Food security has been noted above and below as the primary purpose and benefit of cassava consumption, at least in areas for expansion outside the cassava belt. Moving towards a marketable surplus of 4 million tonnes will require a massive shift not only in production but also in producer orientation towards commercialisation.

Beyond the farm gate, four market channels have been identified for cassava, which are interrelated by complex price relationships for which very limited data are available:

- farm households selling surplus into local markets for human consumption to traders and direct to Lusaka (study area)
- farmers & intermediaries process into flour for products for human consumption
- processed cassava for livestock feed
- utilisation of cassava for starch for glue, paper, wood, plus ethanol, including export opportunities.

In the first instance, cassava is grown for on-farm consumption and to enhance food security. Commercialisation in the cassava belt is low because of limited local market opportunities and the high transport distance and transaction costs of commercialising cassava in the major (potential) consuming regions of the Copperbelt (agroindustrial processing) and Lusaka (agroindustrial processing and direct human consumption). As noted, co-locating production and processing initiatives has potential to create cassava clusters which enjoy logistics and coordination efficiencies, with potential for more sophisticated supply chain management than exists within traditional marketing systems. In this context, 'co-location' means the coordinated targeting of development activities: ensuring that a) national and international public financial and infrastructural investments, b) national public and NGO development interventions and c) private sector investments and initiatives are directed to areas with natural and human comparative advantage for cassava production, processing and consumption.

Whereas for rural populations outside the cassava belt, consumption of fresh cassava is a relative novelty, fresh cassava is something of a luxury good in Lusaka and realises high prices. Similarly, cassava flour for human consumption appears to be a premium product attracting much higher prices than cassava for industrial processing. Farmers within reach of the urban markets are therefore attracted by the fresh market and not the processing

industry. However, because of the high transport costs and perishability of the fresh product, the northern and western cassava-growing provinces are unable to supply the urban market.

Competition with maize policy

One of the principal constraints to developing the commercial potential of the cassava sector is the attractiveness of prices in relation to maize. In particular, there is a significant relationship between the supportive maize policy and very limited support for cassava. Although the level of support has been reducing, maize policy is still highly regulated and includes price support, public sector purchase and input subsidies, enjoys a well-developed distribution system for inputs by seed firms, and has a dedicated public sector agency, the Food Reserve Agency (FRA) as a buyer of last resort (Govereh et al, 2010). While the maize sector is thus subsidised and privileged, it will be difficult to increase the level of cassava utilisation by industry and investment by the private sector in new processing infrastructure and new product development will be risky and unrewarding.

Two more issues affect the relative prices of maize and cassava:

- millers and grain traders are able to undercut the subsidised maize floor price by 10-20% by buying from maize from smallholders who need to sell maize for immediate cash needs
- because maize has a higher protein content, processors have to supplement cassava as an ingredient with protein-rich ingredients in order to maintain the same nutritional value, and therefore can only afford to pay 60-70% of the maize price per kilo of cassava.

Finally, a fundamental review of the role of the Food Reserve Agency is timely: the scope of the current activities represents a significant expansion after the reduction in intervention undertaken in the 1990s: 'the FRA, [which] now buys at least half of the marketed maize surplus produced by smallholder farmers at prices well above market levels (Govereh et al, 2010: 383). The need is, not least, to reduce the effect of intervention in 'squeezing out' private enterprise.

Absent supply chain management

It is partly because of the unfavourable price scenario confronted by the processing industry that firms are not only unwilling to invest in processing capacity, but also unwilling to invest in supply chain management practices that involve direct engagement with producers: the private processors are unwilling to provide planting materials and organise and train producers. Cadoni's interviews among industry players in the north showed a complete absence of contractual arrangements between suppliers and buyers (2010: 17); and Poole et al (2010) found no evidence of institutional linkages between the private processing industry and cassava promoting organisations and growers. One firm was the exception, Authentic Foods, which had business arrangements with a producer- processing group in Chongwe, the Kanakantapa Women Cassava Processors (KWCP) (see below).

Firms want a clear commitment from producers to supply and deliver cassava to processing plants. Because of unfavourable prices, the complexities of sourcing and the supply chain weaknesses, firms such as Tiger Animal Feeds and National Milling are as yet unwilling to

adopt cassava in animal feedstuffs. Uptake by flour miller/manufacturers such as Chico Biscuits for human consumption is also limited by substitutability constraints and the current extent of the market for cassava-based manufactured food products.

4.4 Solutions to market failure

The formation of the multistakeholder platform has been a fundamental step in identifying weaknesses and in coordinating a sector response to the market, policy and support service failures in the cassava sector. The cassava sector strategy identifies numerous interventions and initiatives, as well as a need for additional data, to put policies into effect that will boost supplies to reach projected demand. The strategy group is a remarkable achievement, but further specific investments in sectoral collective organisation are needed. Ultimately, ownership of the strategy is complicated and responsibility for implementing the proposals – project management - is unclear. Further development of sectoral organisation is required to enable the new ways of organising producers, firms and markets, donors and policy makers to work for the poor (Poole and de Frece, 2010).

Sectoral organisation

In the first instance, further development of the multistakeholder platform to become an effective and representative organisation is necessary. System-wide, comprehensive and inclusive, rather than ‘point’ type interventions in the supply chain require planning considerable coordination (Poole and de Frece, 2010). The French ‘interprofessional’ model can be adapted to assist in the formation of an industry ‘umbrella association’ to boost the efficiency of functions such as sharing of information, participatory problem diagnosis, making joint investments, ensuring contractual clarity between buyers and sellers and emplacing informal remedial mechanisms (Poole and de Frece, 2010). The strategy group currently has little representation from the grassroots farming sector, nor from traders and transporters.

A cassava sector organisation needs a formal constitution, appropriate democratic structures and transparent decision making powers. Coordination within the sector needs to reach down towards the grassroots District-level farmers’ associations, and develop a cassava commodity association. Local chairmen and cassava commodity representatives may be members of the Zambia National Farmers’ Union and such a structure has the potential to meet the requirements. Special provision should be made for the participation of women, who are the farmers and on-farm processors, as well as men, who are the principal grassroots actors in commercial producer initiatives.

Attention must be given to the development and management of linkages from the major cassava sector stakeholders to policy makers and donors and other related and supporting sectors, for example transport, knowledge management and communications (see intersectoral coordination below). There are few if any examples of initiatives and interventions of the necessary breadth and depth to meet the range of objectives of the cassava sector strategy. Probably this is new territory for agricultural development, beyond the scope of the cassava sector coordinating committee. Indeed, the coordination challenges probably exceed the capacity of any single organisation other than a purposely-created parastatal such as the Food Reserve Agency in the maize sector. Such a solution should be viewed with caution.

While incorporating many stakeholders in the strategy formulation platform has been a considerable strength, one weakness is that it is not a body that is strongly led by the private sector. Experience suggests that articulation of demand and supply chain organisation is likely to be most effective through private sector firm leadership.

Beyond sectoral organisation: intersectoral coordination

The strategy Implementation Framework recognises the need for coordination but does not suggest a precise plan or mechanisms for linking the diverse organisations and firms within the cassava sector or how to link with other economic sectors.

The supportive environment created by the attitudes of and investment by the Ministry of Agriculture, major donors and NGOs have propelled the cassava sector into the limelight and into the focus of this project. Such support has been necessary but is not sufficient: while a multistakeholder platform and umbrella-type sectoral organisation includes direct stakeholders and increases the chances of sectoral coordination, there is a need to address the linkages between the sector and other stakeholders outside the sector. These have to do with infrastructure and communications, business development services especially from the private sector, nutrition and health, and universities and private laboratories in the knowledge sector, *inter alia*.

There are significant linkages between cassava commercialisation and other sectors, notably logistics and information management. The costliness of transport of cassava, which is of a low bulk/value ratio, requires updated infrastructure through appropriate public investment: improved roads and bridges. As noted, co-location of investments should introduce efficiencies in business coordination. While the elimination of internal transport controls would facilitate the operations of transporters, the possibility of recouping public investments by using tolls may be desirable. Another intervention that will help maximise efficiency is an information exchange for transporters of cassava and other goods in order to improve bulking and access to 'backloads'. The Zambia Agricultural Commodities Exchange (ZAMACE) launched in 2009, which trades principally maize, wheat, soya and fertiliser, could be encouraged to diversify into information brokerage on supply, delivery and demand, and cassava trading. ZAMACE expertise can also help in determining contract design and standards to reduce transaction costs and provide an example or potential framework for remedial action. It is technologically and socially feasible for electronic information linkages to be put in place – say linking producer organisations to the 'centre' such as ZAMACE - in order to improve information management (Matthee, K.W., Mweeba, G., Pais, A.V., van Stam, G. and Rijken, M. 2007).

Coordination of the cassava strategy with other agencies must extend to the international donors and other agencies which have supported initiatives undertaken so far (eg JICA, Italian Development Cooperation, UN agencies) and others which have participated in the strategy development (ILO, ITC, IITA) – and those that might be invited to finance the individual activities.

In the small enterprise funding arena, Regmifa Microfinance Fund for Africa is a potential partner. Regional Micro, Small and Medium Enterprises (MSME) Investment Fund for Sub-Saharan Africa (REGMIFA) has been envisaged as a specialised investment fund established

in Mauritius, promoted by a donor consortium composed of leading Donors/DFIs and IFIs and led by German Financial Cooperation (KfW), in order to enhance long and medium financial needs of local financial intermediaries providing funding to Micro, Small and Medium Enterprises in Sub-Saharan Africa. This operation aims to meet the objectives of the Cotonou Agreement for the eradication of poverty by supporting the improvement in the quality, availability and accessibility of financial services and the development of modern financial institutions and sustainable microfinance operations.

Coordination mechanisms?

We have noted that the implementation stage will need to address precisely many practical questions of 'how to...?' Regarding approaches and initiatives to form linkages between different players in the value chain, considerable experience has been gained by (I)NGOs and research organisations in terms of 'making markets work for the poor' (MMW4P) (Poole, N.D. 2009). The principal elements of MMW4P are analysis of the market context, design of appropriate frameworks and interventions, with multistakeholder participation – which obviously are consistent with the cassava sector strategy:

‘The approach stresses the process of creating opportunities through increasing access to markets, achieving equitable and remunerative prices for goods and services, and reducing risk. Importance is also attached to monitoring the wider economic environment to take account of the trends in political and institutional change. Analysis should have a temporal dimension, anticipating that as markets in an ‘infant economy’ evolve from a rudimentary status towards ‘maturity’, forms of intervention also mature: that is, small firms which initially need a protective business environment should grow and be weaned off support mechanisms such as favourable fiscal and financial treatment, and be exposed gradually to the rigours of competitive markets’ (Poole, N.D. 2009: 42).

Another coordination approach is Participative Market Chain Assessment (PMCA), one of the new methodologies that has emerged from the shift towards a multistakeholder ‘systems’ process involving international donors and researchers, national researchers and development agencies, and agricultural sector players (Poole, N.D. 2010). Developed in Ecuador, Peru and Bolivia, PMCA is described as a ‘new form of collective action’ (Devaux, A., Horton, D., Velasco, C., Thiele, G., López, G., Bernet, T., Reinoso, I. and Ordinola, M. 2009: 32). In Africa, INGOs and donors have collaborated with the Regional Potato and Sweetpotato Improvement Network in Eastern and Central Africa (PRAPACE) and several local public research and development organisations to implement PMCA in Uganda. The key elements of the process are:

- Participation: planning, decision-making, and evaluation must involve local actors
- capacity building: a comprehensive training strategy including formal training workshops, practical hands-on work with commodity groups
- communications and knowledge sharing; and
- learning-oriented evaluation.

It will be important to make use of such experiences when designing the precise sectoral coordination mechanisms. Whereas MMW4P and PMCA have tended to work at a local scale, the Zambian cassava sector is a much larger target, which not only explains the novelty of the strategy formulation process but also underlines the scale of the challenges in progressing beyond conceptualisation and pilot interventions to national implementation. Moreover, for PMCA at least, questions remain about the potential for uptake and upscaling the process. At first sight, the input of resources is high: both time and the financial demands are high and likely to limit the extension of the model. Sustainability is yet to be proven, either of the individual innovations, which need further study, or of the process, that is to say, the permanence of partnerships and stakeholder platforms (Poole, N.D. 2010). Linking the willing intermediary firms with a disparate, dispersed and un- or disorganised national supplier base of smallholder farmers – such as Zambian cassava growers - is one of the principal scale challenges to value chain management.

Producer-level organisation

The strategy says very little about farmer organisations and how to engage smallholder producers collectively. The novel concept of agribusiness centres is proposed but evidently is not considered to be a substitute for existing producer organisations. Nevertheless the linkages between existing forms of collective organisation and the new organisations envisaged will need to be clear before such organizations are promoted. Much has been learnt over the years about how producer organisations develop – and fail (Poole, N.D. and de Frece, A. 2010) – and should be reflected in clear implementation plans for sectoral horizontal and vertical organisation.

Specific investments in human and social capital and business and organisation are needed to enable new ways of organising people and markets to work for the poor - including agricultural smallholder collective enterprise. A workable model for smallholder collective involvement in processing and marketing is the Kanakantapa Women Cassava Processors (KWCP). KWCP is an interesting case that has evolved over time from a combination of grassroots initiatives and donor support (PAM and JICA). In its origins and innovative structure, internal organisation and constructive partnerships with donor organisations, KWCP exhibits the characteristics of a viable smallholder organisation. At the same time it faces the challenges of growth and development into maturity and sustainability (Poole and de Frece, 2010). What is clear from reviews of the performance of producer organisations in Africa and more widely is that the development of sustainable community or collective business organisations needs substantial support in terms of the range of business development services, of coordination among the agencies which provide services and a commitment to a long-term process of learning by doing.

Zambia has a tradition of cooperative organisation that, like many Sub-Saharan African countries, is at best mixed. In general, failures in collective enterprise outnumber the cases of viable and sustainable business organisations. Experience shows that there is no single success factor, model or process to create sustainable producer organisations: there is no 'one-size-fits-all'. Successful organisations may be new initiatives or be based on pre-existing organisations. They may be external or grassroots initiatives. To grow in scale and organisational complexity, external resources are usually required. The basic question is

whether such firms can be created by policy initiatives, or do they grow out of local opportunities: agribusiness centres or local initiatives?

The development path is often uneven, sometimes with failure and rebirth from the ashes of incompetence, corruption and bad luck ('phoenix' organisations: Kachule, Poole and Dorward, 2005; Donovan, Stoian and Poole, 2007; Poole and de Frece, 2010). External donors and support organisations need to recognise that growth of producer organisations and rural enterprises to maturity is slow, and that accompaniment is necessary for years rather than months. KWCP is at a relatively early stage of development but is a model of a small-scale local producer-processing organisation developed with external support that PAM is willing to try to replicate elsewhere.

The KWCP model depends on outside support targeted at a specific local context, probably with an input sustained over some years. Donor funding can pass through an NGO working in a specific area for infrastructure development, technical training and organisational capacity building. What remains to be developed are the supply chain linkages with downstream enterprises.

Admittedly it is small-scale, replicable, but different from the scale and mode of enterprise development envisaged in the cassava sector strategy. The strategy recognises that support is needed at a large-scale for the development of production, processing and trading capacities. It is envisaged that donor funding and training resources for development of the production and processing sectors be channelled through a new network of local agribusiness centres. This is an elaborate and costly cassava-specific programme that is additional to existing agricultural development activities, and therefore it is appropriate to question whether integrating new initiatives within existing structures is better than supplanting existing training, organisational development and commercial activities.

At the producer level, KWCP shows that it is advantageous to work with a pre-existing organisation and make such organisations effective. The alternative is to set up new community organisations. While this can be effective, there are also various consequences that might be negative. Setting up new organisations could lead to duplication and confusion, wasted efforts, disempowerment of existing local initiatives, lack of community ownership of new initiatives, disillusionment, and conflict.

New organisations also face problems of (self-)selection of new members that will tend to exclude certain groups. The question of targeting and (self-)selection (of members) introduces ethical questions that development policies do not usually tackle. For example, it was evident from interviews conducted in Chongwe that men felt excluded from the KWCP initiative. The ethical nature of such 'positive discrimination' needs to be examined, just as much as biases towards the 'not-so-poor'.

4.5 Public goods and market failures

Processing technologies and product development

The cassava sector strategy contains substantial detail about the knowledge requirements and dissemination pathways for appropriate processing technologies and new product

development. Strategies in these areas identify multistakeholder partnerships from all levels of the value chain (farmers, processors, researchers, industry).

Extension: technical training and distribution of planting materials

The cassava sector strategy does not directly address the problem of the production and distribution of planting materials in detail: 'Establish a decentralised and participatory cassava cuttings production system (three tier system). The limited evidence available from Chongwe District in the cassava belt suggests that access to appropriate planting materials will be a significant constraint to expansion of the sector and is likely to limit progress towards the ambitious production targets.

The sustained support from the public sector and the NGO sector through research, development and extension of planting materials has built the potential of the sector. More remains to be done in terms of the multiplication and dissemination of improved varieties best adapted to the local agroecological conditions.

While possibly not representative of the extension programmes, the promotion of the *manyokola* variety in Chongwe District has not provided planting materials of the right quality (in respect of variety and disease resistance) and quantity (to meet all smallholder demands). MACO should delegate to private initiative, local NGOs and civil society organisations the responsibility to deliver the necessary services. For the production of planting materials, two complementary approaches can be taken, building on previous policies for the extension of cassava production into new growing regions:

- local communities to identify sites and growers responsible for production; these would be local community nurseries. Limited human and financial resources are necessary for this modality
- In addition, planting materials can also be disseminated over a large scale by collection and/or by purchase (using public funds) of planting materials from major growing areas by private firms and/or local NGOs. Delivery of materials requires private contractors funded out of public and/or donor funds. Supply of inputs by private sector product buyers, would have the benefit of developing contractual linkages as in many other commercial supply chains.

Timing of collection and distribution of planting materials is critical, but previous experience of distribution projects in recent years can be drawn upon. Geographical coverage of distribution needs to be coordinated and managed, probably by MACO in association with participating NGOs.

Research into the industrial utilisation of cassava and its incorporation into the food and feedstuffs industry is an activity that has been partially addressed, but the private sector manufacturers and financiers are not yet aware or convinced of the business potential of industrial cassava. Arguably the development and provision of information to the financial sector to encourage lending to processors and manufacturers is a case of market failure that the public sector research organisations can address.

The absence of clear national standards in respect of product quality and varietal characteristics specific to industrial processing is a weakness that can be addressed by the Zambia Bureau of Standards, another strategy group member.

Finance delivery

The international evidence base for designing and implementing public-private partnerships in agricultural value chain development is limited. Working examples are a novelty, and appropriate lending mechanisms to large private sector firms and to smaller-scale processors are a challenge when lenders consider the enterprise to be high risk and low potential reward. Innovative systems of financing can be employed to channel development funds to lending organisations through competitive tendering. Similarly, firms and organisations within the sector can engage in competitive tendering for grants and loans for enterprise development, maybe in partnership with supply chain stakeholders, as has been practised in recent years by UK DFID (Poulton, 2009).

IFAD have experience of competitive tendering for finance. New funding mechanisms are also contingent on two other elements: adoption by producer organisations – like KWCP – of a business structure that exploits the potential of new generation cooperative organisation; and innovative means of leveraging private sector investment into collective (probably community-based) organisations (Poole, 2010).

New forms of delivery are needed, and the lack of interest from the private sector so far, notwithstanding the public sector support for cassava, suggests that the conditions of market failure are present to justify carefully designed intervention and innovation. There is scope for further research in delivery mechanisms for this level of micro-finance: new knowledge and evidence is needed to design appropriate financing mechanism, particularly for delivery of small-scale funds to grassroots organisations: micro-funding maybe up to \$10000 for infrastructure for an individual processing plant. Private sector business service firms (such as accountants) can be invited by national banks and international financial organisations to design and implement models of competitive tendering and challenge fund approaches for micro-enterprise development. Similarly, private investors can be invited to participate in micro-equity funds willing to invest in such enterprises – which are most likely to be community-based, or founded around some other collective entity like local faith organisations.

4.6 Private and public sector roles?

There is a question of who should be responsible for new activities. Facilitating private sector initiatives and investment in situations of market failure is problematic, and experience is limited. 'Whilst there has been plenty of talk in recent years about innovative public-private partnerships [PPPs] to leverage private investment in poorly functioning agricultural value chains, in practice there has been relatively little action. Many interventions are still at proof-of-concept stage and there have been few formal evaluations' (Poulton, C. 2009: 5). Poulton suggests that existing mechanisms are 'pioneering' because much still needs to be learnt in order to design successful private-public partnerships in African agriculture.

First and foremost, the state must provide a stable, coherent and transparent policy environment within which entrepreneurship can flourish.

Thereafter, innovative collaborative arrangements in the cassava sector will require that individual needs be carefully evaluated, 'binding constraints' identified (Poulton, C. 2009) and initiatives designed on a case-by-case basis. The strategy has begun to address these issues and greater clarity will emerge as implementation proceeds. For example, among alternative mechanisms, the public sector can:

- Deliver agricultural extension services (eg Ministry of Agriculture and Cooperatives)
- institutionalise product standards and quality controls (eg Zambia Bureau of Standards)
- conduct national and international market research and feasibility studies (eg Zambia Development Agency)
- conduct technical research (eg Zambia Research Institute, Root and Tuber Improvement Programme).

Nevertheless, some of these, and many other functions can also be devolved by the public sector to others. The public sector can:

- Contract private firms to deliver goods (eg planting materials) to smallholder farmers
- contract third sector organisations to deliver services (eg technical and managerial advice) to smallholder farmers
- provide loan guarantees to financial and marketing intermediaries.

Other pointers to such novel approaches are the following:

- Such private-public partnerships need multistakeholder design
- international donors and organisations with previous experience can design innovation and challenge funds to channel finance to private sector value chain partnerships for investment in processing and manufacturing
- the chances of success will be increased with clear local ownership, for which the multistakeholder strategy platform has been an essential foundation
- ombudsmen' or third party organisations will be important in monitoring and auditing such mechanisms.

However, success will be path-breaking and caution is necessary: 'PPPs do not overcome state failure: even where market failures are the presenting problem, state capacity to design and administer effective PPP mechanisms may remain a constraint to private investment' (Poulton, C. 2009: 51).

4.7 Implications

Household production

Much more needs to be understood about the smallholder cassava farming sector. It is known that significant differences exist between the traditional growing regions of Luapula, Western, Northern Provinces and the non-traditional growing regions, eg around Lusaka, in respect of a range of important factors:

- cassava production
- agricultural productivity
- markets, marketing and marketers
- knowledge, information, communications and logistics
- consumption patterns

Primary data collection can be directed to other areas of Zambia to enable the generalisations and policy formulation about the propensity of smallholders to respond to sectoral initiatives and smallholder-level organisation to meet the demands of commercialisation. Besides household socioeconomic data such as resources or livelihood assets and the external opportunity and constraint set, more knowledge is needed concerning attitudinal issues, aptitudes and attributes which may be important in determining farmers' responses to new incentives. Fundamentally, do farmers want to grow cassava? At whom should interventions be targeted?

Market organisation and linkages

Commercial development of the cassava sector requires effective smallholder representation in strategy development. Attention must be given also to the development and management of linkages from the major cassava sector stakeholders to policy makers and donors and other related and supporting sectors, for example transport, knowledge management and communications.

Collective enterprise is necessary but viable producer organisations alone are not sufficient. Given increased cassava output, there also needs to be an increase in marketing capacity: bulking currently depends on small-scale entrepreneurship, and transport facilities in respect of roads and carrying capacity are again limited; pricing and other quality information signals are rudimentary. Investment is needed along at least two dimensions in order to create genuine business partnerships:

- improved client relationships between cassava sellers and buyers (who may be individuals, collective organisations and private 'corporate' enterprises) are necessary to build trust and reduce the significant transaction costs associated with spot trading (Poole, N.D. and de Frece, A. 2010);
- improved specification of transactions to cope with more complex demand characteristics can be achieved by using standards for cassava varieties, protocols for cassava production and product processing, grading, standardisation and packaging of

cassava products, quality control, price transparency, payment and delivery terms (Poole, N.D., Seini, A.W. and Heh, V. 2003).

For implementing a cassava sector investment and development strategy, much more needs to be learnt, *inter alia*, about the role of small-scale traders who are much maligned but also act as such important players in traditional African market systems in linking farmers to both urban food and industrial/feed markets. Small-scale traders must not be squeezed out and are likely to have an important role in bulking and delivery of cassava to intermediary processors and manufacturers (Poole, N.D. *et al.* 2010). Traders can also be channels of inputs, market and technical information and finance to producers, and can be influential in propagating and upholding standards and grading systems and product quality control that are essential for the successful commercialisation of agriculture.

5 Concluding comments

The process and product of strategy development has been a considerable achievement to which multiple stakeholders have contributed. The next phase of implementation poses equal challenges, with final success likely to be dependent on the precise definition of many details. It will be obvious that a 'blueprint' approach will be inappropriate, and that there will be iterative stages of problem identification and resolution throughout implementation. Throughout, experiences from other contexts in Southern Africa and other regions can be drawn upon. Although in problem solving there is 'no one size which fits all', the considered assessment of past approaches can be used to adapt existing sectoral development activities and models, and also to find novel solutions to hitherto intractable development problems.

While these recommendations are more suggestions as to what needs to be borne in mind than solid modalities for moving forward, the proximate prize is a growing cassava sector in Zambia that can provide insights for other sectoral development strategies:

- Realistic targets
- private sector leadership
- multistakeholder coordination
- coherence with other national policies
- entrepreneurship driving all stages of the value chain
- novel organisational and financial mechanisms embedded within existing institutions

The ultimate prize is, of course, a viable industry that includes smallholder farmers on terms that assure wider development objectives: returns which enhance rural livelihoods, foster equitable social and economic development, enable sustainable resource management and achieve international competitiveness.

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