

**FOOD AND AGRICULTURE
ORGANIZATION
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CASSAVA

Value Chain Analysis of the Cassava Sub-Sector in Zambia

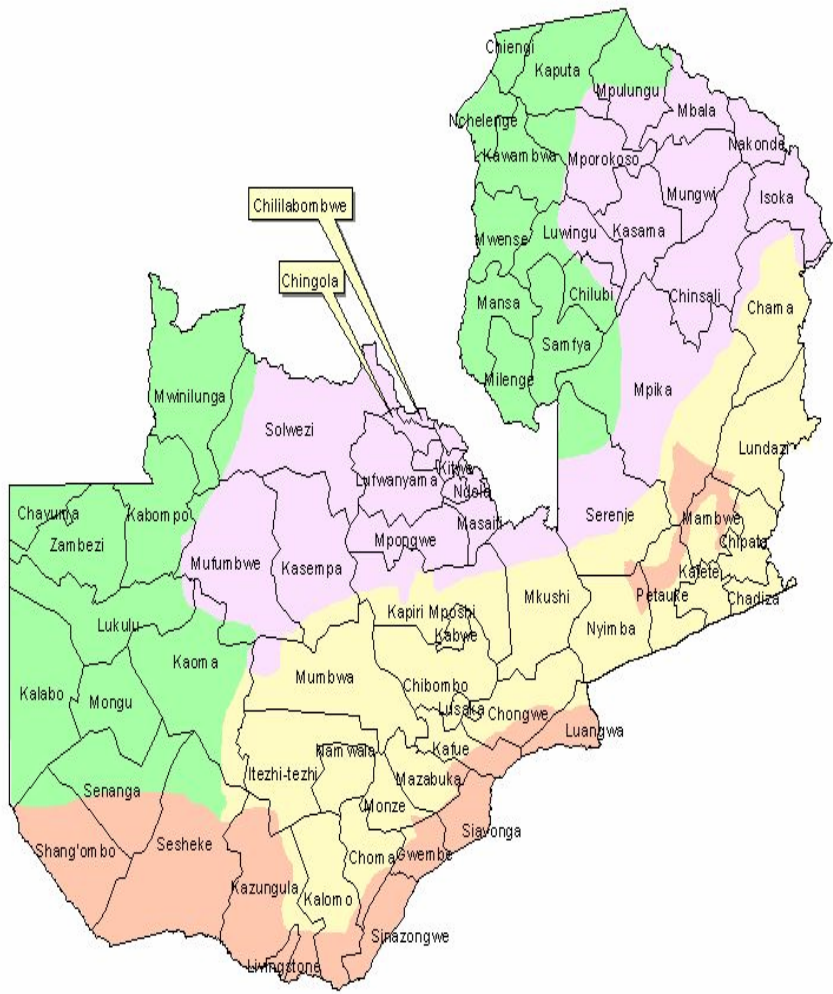
Part II: Value Chains Analysis Final Report

GTFS/RAF/364/ITA

Food and Agriculture Organisation of the United Nations

April, 2008

Cereal and Cassava Belts in Zambia



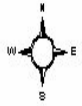
Crop Belts

- Cassava
- Cassava/Maize
- Maize
- Maize Drought
- District Boundaries

Data Source:
ZVAC April 2003 Food Security
Assessment.

Desktop Mapping and Map Design
by WFP, VAM UNIT.

Produced in April 2003



Acronyms

ACF	Agricultural Consultative Forum
ACU	Acceleration of Cassava Utilisation
AIDS	Acquired Immunity Deficiency Syndrome
CAADP	Comprehensive African Agriculture Development Programme
CLUSA	Cooperative League of the USA
DFID	Department for International Development
DRC	Democratic Republic of Congo
FAO	Food and Agriculture Organisation of the United Nations
FBS	Food Balance Sheet
FEWSNET	Famine Early Warning Systems Network
FEZ	Food Economy Zones
FOB	Free On Board
FRA	Food Reserve Agency
HIV	Human Immune Virus
HVCF	High Value Cassava Flour
IFAD	International Fund for Agriculture Development
IITA	International Institute for Tropical Agriculture
JICA	Japanese International Cooperation Agency
MACO	Ministry of Agriculture and Cooperatives
mt	Metric Tonnes
NEPAD	New Partnership for African Development
NFNC	National Food and Nutrition Commission
NGOs	Non Governmental Organisations
PAM	Programme Against Malnutrition
RTIP	Roots and Tubers Improvement Programme
SARRNET	Southern Africa Root Crops Research Network
SHEMP	Smallholder Enterprise and Marketing Programme
SWOT	Strengths, Weaknesses, Opportunities and Threats
ZAMSEED	Zambia Seed Company
ZATAC	Zambia Trade and Agribusiness Company
ZNFU	Zambia National Farmers' Union

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Executive Summary

1. Cassava (*Manihot esculentus*) was introduced from the Amazonian Basin to Zambia around 1700 by Portuguese traders and explorers. Cassava has since taken root in many areas of Zambia, especially the high and medium rainfall areas. Over 4 million people, representing about 30% of Zambia's population now directly depend on cassava as a staple food.
2. Cassava is worthy promoting as a food and cash crop because of its adaptability, low labour requirement, good ground storage, multiple by-products and high energy output per unit area and labour compared to cereals. This renders it as a suitable and cheaper substitute for cereals in starch and feed manufacture. Cassava can be processed into many domestic and industrial by-products including flour, pellets, feed, bakery and starch.
3. In Zambia, recent improvements in national statistics have revealed an increasing trend in cassava contribution to the Food Balance Sheet explained by unreliability of maize as food secure crop during adverse weather conditions. The notion that cassava is nutritionally rich food is filtering to consumers and that, when processed properly, it can be a rich source of energy, crude fibre, calcium, iron, thiamine and nicotinic acid. The cassava leaf has more protein and energy, protein, fats, calcium, phosphorus, iron, vitamin A, B1, B2 and C content than most green leafy vegetables.
4. In Zambia, the growing urban market for cassava products is a promising avenue for the development and commercialisation of the cassava industry. Four main value chains offer much potential for commercialisation: Animal feeds, Bakery products, Starch industry and Food staple and relish.
5. This report examines the status quo regarding how cassava farmers in Zambia link in with markets and how different players at various stages of the cassava value chains benefit from value adding initiatives. It examines, at various stages, the value adding practices and returns to them, constraints faced and how they respond to the linking or promotional efforts or supportive organisations as well as the enabling environment prevailing.
6. The main objective of the cassava value chains study on which this report is based was to identify priority cassava value chains and reveal indicative patterns and trends, assess capacities and identify key constraints at various stages with a view to inform the cassava commercialisation programme.
7. The study was conducted in the FAO project area (Serenje, Samfya and Mansa), targeting farmers, traders and processors, as well as in urban Lusaka targeting traders, retailers, processors and consumers. The cassava farmers and traders were purposively selected as typical case studies to collect detailed data on each to enable the calculation of gross margins and to build profiles describing their activities, inputs, outputs, profitability, marketing, constraints and opportunities. A total of 82 respondents including case study producers and traders from the three target districts and in Lusaka were selected using simple random sampling.

8. In view of the richness of prior work and studies on the subject of cassava, the study was divided into two parts: Part 1: Literature Review (Report available) for identification of data gaps for information required for value chain analysis. This informed and influenced the size and methods of Part 2: Field survey for value chains analysis.
9. Analysis based on national level production of 1,056,000mt of flour (equivalent to 4,224,000 mt fresh weight), shows the dominance of subsistence consumption for cassava in Zambia and the huge gap between production and traded volumes. Over 70% is consumed locally within the communities.
10. The 30 percent of cassava traded enters the market as fresh tubers (10%) targeted at local exchange or barter, roadside sales and urban consumer markets where is consumed it as snacks. The other 20% traded is processed as chips and targeted at urban domestic and industrial consumers for flour, stock feeds and high value cassava flour (HVCF) and starch. This is a new and emerging channel that requires expansion.
11. The average yields in the project area, at 9,992 kg/ha is in line with national estimates. Cassava is a low input enterprise with only family labour, hired labour and stem cuttings as main inputs. Gross margin analysis revealed a return to family labour of K66, 075 way above prevailing rural wage rate of K10, 000.00. Return to capital ranged from 25 to 35%, above prevailing bank interest rates of about 20 percent.
12. Based on the analysis trader case studies, the average market margin in cassava trading is 96%. However, this figure was skewed by the high return from the Congo DR market. Removing the Congo DR market dropped the return to 36.5%. The farm return on capital investment in cassava was estimated a 29% for flour. Even though the market margin is higher, one cannot conclude that this is exploitative.
13. It is apparent that traders have a close relationship with producers and many of them intersect as both farmers and traders. Many are experienced and are skilled in negotiations and price monitoring. They have knowledge of cassava production, grading and standards. But in their present state, traders remain too weak and disorganised to form a good basis for strengthening value chain linkages to industry in urban areas.
14. The proportion of processing cost to marketing cost was 25 percent and was as high as 38 percent for some traders. Transport cost was next a 24%. Milling and transport formed a significant part of the total marketing cost. One encouraging factor is however, that there is a flourishing expansion of commercial millers specially packaging branded cassava flour. This cassava is being well displayed and stocked in major supermarkets as branded, graded and well packaged cassava flour. Almost all major supermarkets and retail shops now stock cassava flour.
15. Grading, sorting and packaging of cassava flour are still developing aspects of cassava marketing in Zambia. ACU together with Zambia Bureau of Standards (ZABS) have been developing standards for cassava marketing. By the existing laws, processed food like cassava must be labelled and should give the following information: Brand or trade name, common name of the food, net contents in terms of weight, volume or number, ingredients, in descending order of their proportions, coding and date marking, name and address of manufacturer, packer, distributor, importer, exporter or seller, sell-by date and special storage conditions. Some sellers are no meeting these requirements.

16. Interviews with various restaurants and hotels revealed a less than encouraging scenario of cassava flour consumption. Many of them mentioned the lack of international appeal of cassava as food as the reason for not including it on their menus. Others bemoaned the erratic supplies. But a few are willing to experiment. Most restaurants simply have not tried it because they are not sure of customer base. The lack of information on customer preferences, nutrient value and diversity of dishes makes these institutions prefer established foods.
17. There is a high level of apathy concerning industrial application of cassava into high value cassava starch, baking flour, and animal feed (millers). Some experimentation has been done but, little progress has been made to integrate cassava into industrial products.
18. Some felt that cassava bread would not sell, but that suitable mixtures should be tested. Others specifically asked for samples of cassava based bread and confectioneries. They were concerned about how people would respond to such products. They recommended a consumer-wide survey with testing of samples of different mixtures. But optimists like Silva Food Solutions think intensive and sustained media campaigns on Radio and TV coupled with workshops on the benefits of cassava are required. A food policy that recognises cassava is required urgently to back up promotional efforts. There is need for more investments and possibly subsidies to promote cassava as an industrial raw material. Allow industry to experiment. There is need to train producers on quality and standards, removing sand particles.
19. The urban consumers who did not eat or consume cassava at all mentioned that they did not like cassava meal taste. Those that ate cassava flour normally mixed cassava meal with maize meal to improve texture and flavour. Cassava meal should be promoted as a mixture rather than a 100% product in all the value chains.
20. An estimate of current urban demand for cassava flour in Lusaka was made based on 20% of urban consumers in Lusaka (population 3.5 million) consuming cassava at 5kg per month, at 42,500mt per year, translating into 168,000mt of raw cassava. If the cassava campaign managed to raise urban consumption to 40% of urban dwellers, then demand would be 85,000mt or 336,000mt of raw cassava. This is 8-10% of the current national production for Lusaka alone.
21. Domestic use of cassava as an animal feed is the least developed of domestic markets. The main constraints in integrating cassava into the stock feed are lack of know-how, technology and machinery for processing, lack of constant supply of the raw materials and lack of market for the product.
22. With respect to milling, Government and promoters need to educate and develop relevant formulae to integrate cassava in stock feed. Intensive adverts to inform consumers about possibilities and impact of cassava based stock feeds on growth rate of livestock is required.
23. The Table below summarises the prioritised interventions. The implication is that short-term interventions should be addressed by the project while laying a foundation for long-term resolution of other longer term challenges.

Prioritised Recommendations to Improve Cassava Value Chains

Action	Justification (see Table 12, 13 and 14)	Priority Weight ¹ (1,2,3)	Stakeholders Responsible	Potential Source of Funds	Timeframe ² (s,m,l)
Intervention Priority One: Market Development and Demand Stimulation	Weakest link in the chain based on lack of information and biased attitude towards cassava as a consumable or industrial product. Lack of assembly points, bad roads, lack of financing, lack of trust among players, low marketing skills, weak market information, lack of consumer interest and low media coverage	1			
• Conduct media campaigns on benefits of cassava as a commercial product.		1	MACO-FAO-ACU	FAO, JICA, WFP	S
• Conduct consumer-wide surveys on different cassava chains products.		1	MACO-ACU	FAO, JICA	M
• Highlight diversity of the end use products of cassava at world level.		1	FAO-ACU	FAO	M
• Link traders and retailers to restaurants, hotels, schools and health institutions		1	ACU	FAO	S
• Support cross border trade through training and market research.		1	MACO-ACU	FAO, WFP	M
• Extend SMS market information system to cassava		1	MACO-ACU-ZNFU	FAO	S
• Improve patenting, branding and quality assurance for on-shelf products.		1	ACU-ZBS-PACRO		S
• Facilitate formation of an association for traders, processors and retailers.		2	ACU	FAO	S
• Link chain players to sources of capital loans and operational credit.		2	MACO-ACU	FAO	S,M
• Support establishment of assembly points and market centres	2	MACO	MACO-FAO	S,M	
Intervention Priority Two: Process and Product Development	Low diversity of products, lack of skills and capital, plant machinery not adapted to cassava, lack of consumer understanding, seasonality of supplies, high energy cost, low grading capacity				
• Improve technical and business skills for processors.		2	MACO-FAO	FAO	M
• Support and provide grants to new product development and research.		1	MACO	Donors, Banks	S,M
• Improve access to capital loans for processors.		1	MACO	Donors, banks	S,M
• Provide technical training for staff in cassava industry.		1	MACO-ACU	FAO	S
• Provide information on the variety and feasibility to use cassava as raw material.		1	MACO-ACU	FAO	S
• Improve business skills for processors.	2	MACO-ACU	Donors	M	
Intervention Priority Three: Improved Production Systems	Farmers know production but: labour constraints, dominance of local varieties, low yield, late planting, Crop disease & pests, inappropriate varieties				
• Provide planting materials for improved cassava varieties desired by industry.		1	MACO-ZARI-PAM	FAO, JICA	M
• Promote early planting of cassava.		2	MACO	MACO	S
• Produce extension packages and promote good management practices.		2	MACO-FAO	FAO	S
• Introduce labour saving implements.		2	Private sector	Banks	M
• Train extension staff in cassava management.	2	MACO-FAO	FAO	S	
Priority Intervention Four: Institutional Support and Cross Cutting Principles	No incentives for cassava industry Bias against traders and processors, weak information base, biased policies, weak resources, weak business skills, players not organised, duplication of efforts by stakeholders				
• Provide coordination forum through the ACU.		1	ACF-ACU	Donors	S
• Lobby for tax incentives for industries that integrate cassava as raw material.		1	ACF-ACU	Government	S
• Lobby for the declaration of cassava as a national supplementary staple		1	ACF-ACU	Government	M
• Facilitate group formation for producers and legalised trader networks		2	ACU	FAO	S
• Promote outgrower schemes for cassava.		2	MACO	GRZ-Donors	M
• Organise Buyer-Producer matching fora and events;		2	ACU-MACO	Donors	M
• Reduce or avoid direct subsidies to the cassava chains or competing product chains.	2	MACO	-	m	

1. where 1=high, 2=medium and 3=low: 2. where s=short-term, m=medium-term and l=long-term

1.0 INTRODUCTION

1.1 Adaptation of Cassava to Zambian Conditions

This report will not dwell much on describing the agronomic aspects of cassava as this has been extensively reviewed in the literature highlighted in Part 1 of the Value Chain Study. Cassava (*Manihot esculentus*; *syn. utilissima* Pohl) originates from North-East Brazil in the Amazonian region of South America. It was

Scientific Classification

Kingdom:	Plantae
Family:	Euphorbiaceae
Species:	<i>Manihot esculentus</i>

introduced to Africa and Zambia around 1700 by Portuguese traders and explorers. As early as 1932, Trapnell and Clothier (1996) indicated that cassava was well known in Northern, Luapula, North-Western, Copperbelt, Eastern, Western, Central and Southern parts of Zambia. Trade in cassava has happened in late 1800 and early 1900 in northern Zambia. Around the 1930s the flow of cassava flour from Luapula into the Copperbelt increased, with the movement of miners to Copperbelt. This trade has continued to day and increasing even more. Over 200 million people in Africa now depend on cassava.

Maize has been the most visibly recognised staple food for most Zambians in rural and urban areas in the last 40 to 50 years. Food security policies and strategies in Zambia have therefore, remained tilted towards ensuring maize self sufficiency. Traditional food crops like cassava, sorghums and millets that are well adapted to Zambian agro-ecological conditions and whose consumption was widely accepted in pre-colonial times are in danger of extinction. Recent policy statements on diversification are rooted in this fear, seeing that maize based national food security has become increasingly vulnerable to droughts and adverse weather conditions as well as economic factors such as the cost of chemical inputs. Experience of food and industrial systems in Asia, the Pacific, Latin America, the Caribbean, Central and Western Africa as well as other tropical countries has demonstrated that with political will, good institutions and the right market signals, and that when properly promoted cassava can be a reliable staple food and industrial raw material.

Cassava has since taken root in many areas of Zambia, especially the high and medium rainfall areas. This spread is also reflected in Table 1 that indicates the range of names by which cassava was locally known. Over 4 million people, representing about 30% of Zambia's population now directly depend on cassava as a staple food.

Part 1 of this study has reviewed detailed literature covering the botanical and agronomic characteristics of cassava. Cassava grows well in warm lowland tropics with moist

climate. Suitable temperature conditions are from 25 to 30°C. Optimal rainfall ranges from 1,000 to 1,500mm annual rainfall even though it can thrive under 1,000mm semi-arid conditions. Well drained light and sandy loam soil types are best for cassava under medium to high fertility. Cassava can be harvested from 12 to 36 months, but optimal yield is between 18 and 24 months. The average yield for mature cassava in Zambia is estimated between 8 and 10tons/ha.

Table 1: Local names of Cassava in Zambia

Tribes	Province	Local Names
Lala	Central	Tute
Lamba, Lima	Copperbelt	Tute
Kunda	Eastern	Tute
Tumbuka	Eastern	Mayawo
Senga	Eastern	Vikau, Muhongo, Chinangwa, Vinangwa
Chewa	Eastern	Vikau, Muhongo, Chinangwa, Vinangwa
Ngoni	Eastern	Nyumbula
Tabwa	Luapula	Kalundwe, Tute
Chishinga	Luapula	Kalundwe, Tute
Bemba	Northern	Kalundwe, Tute
Bisa	Northern	Kalundwe, Tute
Mambwe	Northern	Kalya
Namwanga	Northern	Mayawo
Kaonde	North-Western	Makamba
Lunda, Ndembo	North-Western	Makamba
Luvale	North-Western	Mwanja, Lupa
Ila, Tonga	Southern	Makamba, Mwanja
Nkoya	Western	Makamba
Lozi, Kololo, Luyi	Western	Mwamja

Source: C.G. Trapnell and J.N. Clothier (Ecological Survey, 1932-42)

These botanic and agronomic characteristics of cassava make it widely adaptable to conditions prevailing in northern and western Zambia and among subsistence and smallholder farmers. Even though cassava is a crop of the higher rainfall zones, it is grown almost throughout Zambia for varying purposes. This is because cassava:

- i. Is adaptable to conditions of low soil fertility, high acidity and drought and produces reasonable yields under these conditions. Cassava is highly resistant to common pests and diseases, even though mosaic virus and mealy bug have posed persistent threats in Zambia.
- ii. Requires low labour compared to other crops and can therefore be suitable for labor-depleted households, including HIV/AIDS affected. Cassava is planted over a lengthy period of time, from July to April, spreading the farm labour. Cassava is highly adaptable to mixed and intercropping systems.
- iii. The lengthy harvesting period and ability to remain stored underground renders cassava a food security crop. It can remain underground from optimum maturity

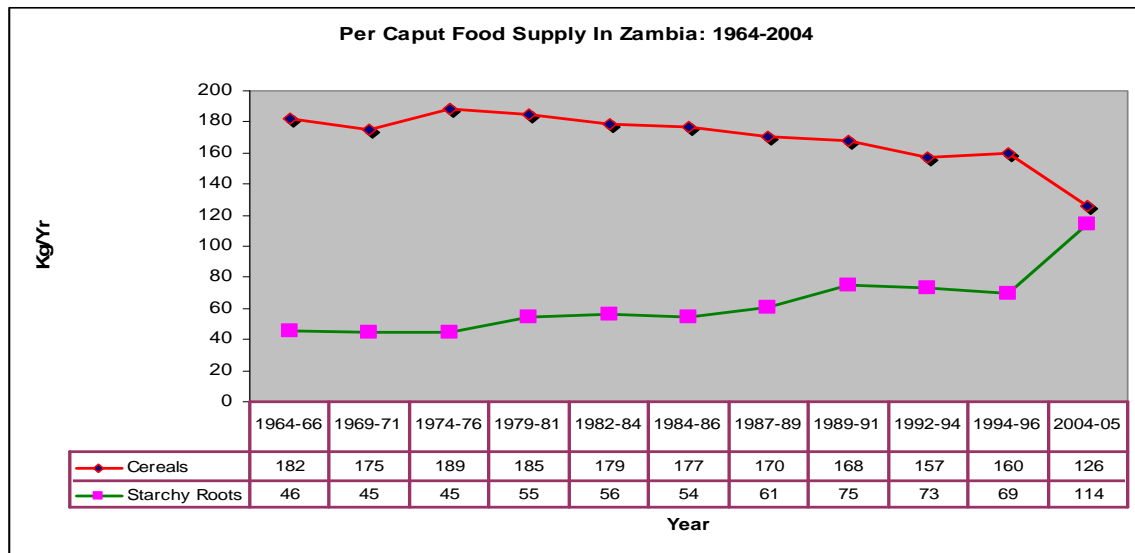
at 15 months to 36 months until required for harvest. It can be harvested at any time of the year.

- iv. Cassava has multiple by-products of value: tubers, leaves and stems are all useful for utilisation and consumption as human, livestock and industrial products.
- v. Cassava is the highest producer of energy per unit area and labour compared to cereals. This renders it as a suitable and cheaper substitute for cereals in starch and feed manufacture. Cassava can be processed into many domestic and industrial by-products including flour, pellets, feed, bakery and starch.

1.2 Trends and Patterns in Cassava Production in Zambia

In Zambia, with improved political focus and the painstakingly slow institutional re-orientation towards neglected crops, recent improvements in national statistics have revealed a trend that shows a declining pattern of cereal (maize, rice, wheat and sorghum/millet) production per capita in Zambia compared to starchy root crops (Figure1).

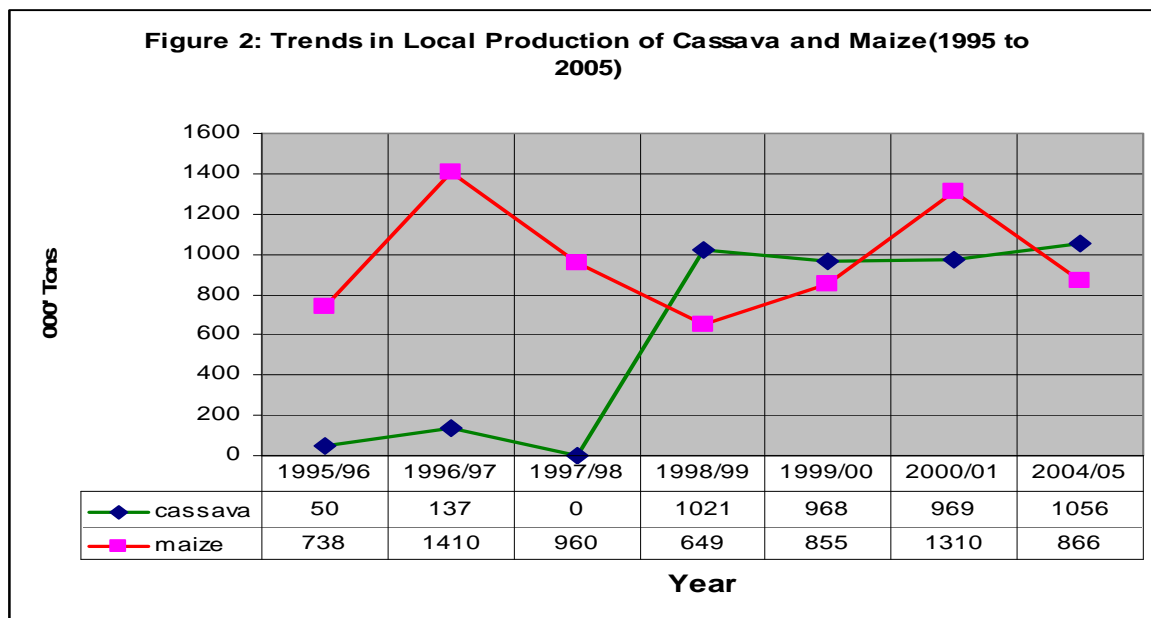
Figure 1: Per Capita Food Supply in Zambia: 1964 - 2004



Source: FAO Food Balance Sheet 1994-96

In support of this observation, **Jayne, T.S. et.al (2005)** observed that “*gradually shrinking landholding sizes over the past decade have led to shifts in cultivation towards crops that provide greater calorific value per unit of land such as cassava and higher value crops, cassava and sweet potato now account for about half of the value of maize production in Zambia*”.

Figures 2 draws on recent MACO statistics that indicate that from 1996 to 2005, the maize equivalent contribution of cassava to the Food Balance Sheet increased tremendously within that decade. An In-depth Vulnerability Assessment Report covering the flood prone season of 2006/7 noted as follows, “Among major crops produced, maize and cassava continue to rank high in terms of output. However, the estimated maize output for 2006/07 dropped marginally by 4% with respect to the previous season, but remained 30% above the preceding five year average. Cassava output significant exceeded the previous year’s output and was 17% above average the preceding five year average. The total area planted for cassava increased by 8 percent in the 2006/7 season with respect to the previous season”. The report therefore concluded flood impact on cassava fields was insignificant in the major cassava producing areas of northern Zambia”.



Source: MACO Agricultural Statistics Bulletin, 1999/2000, Crop Forecasting Survey, 2005/6

It worthy noting that cassava production has remained well entrenched within the high to medium rainfall zone covering Northern, Luapula, Western and North-Western provinces that together accounted for 96% of production and 95% of the area cultivated in 2006/7 season (Table 2). As the table shows, however, Northern, Copperbelt and Luapula Provinces recorded the highest growth rate in production. It is also worthy noting and probably concluding that the massive drought-driven promotion of cassava in the drier southern half of Zambia has failed to stimulate any significant increases in cassava area and production in those areas.

Annual Growth rate: 2001-2004		
Indicator	Annual Growth rate (%)	
	Cassava	Maize
Area	1.6	0.2
Yield	1.7	0.5
Production	3.3	0.6
Sales	5.2	-1.8

Govere, et. al., (2006) using data from the Post Harvest Surveys estimated annual growth rates between 2001 and 2004 for cassava area at 1.6%, cassava yield at 1.7%, production at 3.3% and sales at 5.2%. This indicates that cassava is becoming not only a food security crop but also a reliable cash source. There are several reasons advanced for the apparent rise in the importance and growth of cassava in Zambia.

Table 2: Trends in Cassava Area and Production by Province – 2000-2006

Province	Area (ha)		% change	Tons		% change
	2000/1	2006/7		2000/1	2006/7	
Northern	124,197	146,351	18	259,749	428,077	65
Copperbelt	3,852	4,328	12	8,491	12,658	49
Luapula	92,382	90,882	(2)	282,338	352,179	25
N\Western	29,299	35,966	23	96,929	105,199	9
Central	13,574	10,586	(22)	22,722	20,964	(8)
Western	39,523	40,409	2	129,458	118,196	(9)
Eastern	5,926	2,396	(60)	14,252	7,007	(51)
Southern	251	114	(55)	1,309	335	(74)
Lusaka	-	474	-	-	1,386	-
Zambia	309,004	331,032	(10)	815,248	1,044,615	1

Simply by improving collection of production and yield statistics, Government has taken the first steps towards improving the profile and status of cassava in food security.

One plausible explanation is that no significant change has occurred except that the collection of statistics has improved, revealing better figures over the years (FAO, 2001). Simply by improving collection of production and yield statistics, Government has taken the first steps towards improving the profile and status of cassava in food security. FAO has been developing guidelines and methodology for collecting statistics on roots and tuber crops. Another explanation is that the above cited reason may be true but may not explain the whole picture. Unfavourable weather patterns over the years, coupled with high cost of maize inputs has driven most small-scale farmers towards growing drought resistant and low input crops like cassava. In Luapula, Copperbelt and Northern Provinces, where growth has been highest, improved consumer market opportunities for cassava in urban areas and in Congo D.R. can also explain the increase. FEWSNET (2001) estimated up to 40 % of national production was expected to be off loaded onto the market countrywide in 2001.

1.3 Global Utilisation of Cassava

Cassava flour is a cheap source of energy comparable to maize and rice. The cassava leaf has more protein and energy than the commonly consumed rape. Most rural people will prepare cassava leaves in combination with pounded groundnuts.

The notion that cassava is nutritionally inferior food is being dispelled with more information filtering to consumers that even though cassava is deficient in proteins and fats, and high levels of Hydrocyanic Acid (HCN), and other anti-nutritional characteristics, when processed

well and prepared properly to reduce water content, reduce levels of toxins, stabilise its by-products, improve taste, nutritional content and physical appeal to consumers, it can be a rich source of energy, especially in combination with other sources of protein, like maize and beans, cassava-based meals can provide balanced diets. Bitter cassava contains high levels of hydrocyanic acids and cyanogenic glucoside which are poisonous and can induce iodine deficiency, malnutrition and paralysis of lower limbs. Proper processing of bitter varieties, including soaking reduces the levels of these substances.

Cassava flour is a cheap source of energy comparable to maize and rice. Cassava flour is also quite rich in crude fibre, calcium, iron, thiamine and nicotinic acid. The cassava leaf has more protein and energy than the commonly consumed rape. Cassava leaves are superior to most other popular green leafy vegetables, in protein, fats, calcium, phosphorus, iron, vitamin A; B₁, B₂ and C content (Table 3). Most rural people in Zambia will prepare cassava leaves in combination with pounded groundnuts. This is becoming trendy in many restaurants in Zambia today. In order to benefit from high energy and carbohydrates from cassava-based diets, it should be consumed in combination with other foods rich in protein, minerals and vitamins such as maize, meats, legumes and green leafy vegetables. FAO and WFP are trying to build on this knowledge to fortify cassava meal with additional nutrients. The National Food and Nutrition Commission (NFNC) needs to create more awareness about better ways in which more people can benefit from cassava based diets.

Table 3: Nutrient Composition of cassava compared to other foods

Food source	Water (%)	Protein (g)	Energy (Kcal)	Fats (g)
Crop	Water (%)	Protein (g)	Energy (Kcal)	Fats (g)
Rice	118.0	6.4	366.0	0.8
Maize	11.6	9.4	357.0	4.2
Cassava flour	12.0	1.5	342.0	0.0
Cassava tuber	62.0	1.2	149.0	0.2
Cassava leaf	72.5	8.6	112.6	1.9
Potatoes	77.7	1.7	82.0	0.1
Rape	93.0	2.7	27.0	0.0
Source: MACO, 2000 and FAO, 2003				

Cassava production mainly occurs in West Africa and Congo Basin, Tropical South America and South-East Asia. Nigeria, Brazil, Thailand, Zaire and Indonesia are the leading producers. Globally, cassava is the most frequently processed of major food crops and processed forms are diverse (Table 4). The tuber is carefully and quickly processed using both traditional and improved methods to generate a range of products including chips, flour, starch, *tapioca*, *gari*, *farinha*, *fufu* and pellets. *Gari* in West Africa and *Farinha* in Brazil are examples of processed and acceptable products that have been adapted to trendy urban consumers. The chips and starch are the main raw materials for industrial use. Cassava tuber, leaves, branches and peels provide good meal for livestock, especially cattle, sheep, goats and pigs. Most international trade in cassava comes from Thailand, China and Indonesia, targeting the European stock feed market.

Table 4: Global Utilisation of Cassava

Product	Process	Consumer	Conditions
Fresh Tuber	Raw as salad or snack Boiled or roasted Roasted chips Boiled and pasted – Fufu Peels	Humans	Sweet varieties
		Livestock	Supplements
Meal and Flour	<i>Gari</i> <i>Farinha</i> Retted cassava <i>Nshima</i> Refined Flour for Baking	Human	Processed
Chips, Pellets and Starch	Industrial raw materials Glucose Grocery tapioca Textiles Confectionery Glues	Industrial	Industrial and consumer adaptation
		Livestock	
Leaves	<i>Pondu</i> <i>Katapa</i>	Human Livestock	Processed

1.4 Cassava Value Chains in Zambia

“Domestic markets offered greatest opportunities for business than export markets”

The Global Cassava Market Study (FAO/IFAD, 2004), concluded that domestic markets offered greatest opportunities for business than export markets. The market for cassava as a food

provides greatest potential with import substitution for wheat and other cereal products creating additional cassava demand for cassava. The Minister of Agriculture and Cooperatives, Hon. Ben Kapita, has often stated his wish to support (and even compel) the adaptation of existing industries to substitute a proportion of their raw materials, especially maize and wheat for cassava. Proactively, the National Taskforce on the Acceleration of Cassava Utilisation (ACU) has initiated trials with Tiger Animal Feeds to establish what proportion of maize can be substituted for cassava without compromising quality. Such work deserves the support of FAO through the Cassava Project.

In Zambia, the growing urban market for cassava products is a promising avenue for the development and commercialisation of the cassava industry. This development is premised on market development and delivery of appropriate quality and price of the product to the consumer. Quality and standards will play a critical role as emphasised by the ACU, and this is another area in which FAO can build capacity. Much will be said on this in chapter 3. In Zambia, analyses of opportunities to adapt, diversify and promote cassava have been analysed and four main value chains offer much potential for commercialisation:

- i. **Animal feeds**, raw cassava tuber, peels, leaves and pellets and processed chips can be incorporated into industrial stock feeds, replacing a proportion of established raw materials like maize.
- ii. **Bakery products** utilising varieties with high flour or dry matter content, to incorporate into industrial baking, replacing a proportion of established raw materials like wheat.
- iii. **Starch industry** using large tuber varieties with high carbohydrate content, to manufacture industrial starches, glue and other industrial products like glucose.
- iv. **Food staple and relish** utilising both raw sweet varieties and processed varieties offering flour and edible tops as cheap sources of carbohydrates and protein, replacing a proportion of established maize meal and vegetables.

1.5 Challenges to the Development and Commercialisation of Cassava Value Chains in Zambia

Zambia has through the Root and Tuber Improvement Programme (RTIP), developed improved varieties, such as *Bangweulu*, *Nalumino*, *Kapumba*, *Mweru*, *Chila*, *Tanganika*, *Kampolombo*, with potential to yield more than 30 t/ha. Despite this, the national average on-farm yield is estimated below 10 t/ha. The major reason is attributed to the lack of any policy support and concerted institutional efforts to commercialise the crop. A SWOT analysis of the cassava sector is made in Chapter 3. The main challenges include:

- a. **Markets Opportunities and Access to Markets:** the pull effect for increased investment in improved cassava varieties, integrated production and protection management (IPPM), and processing technology, comes from widening market opportunities. Despite the availability of potential demand for domestic and industrial consumers, cassava farmers remain detached from potential consumers due to lack of market linkages, knowledge and information flow. Assemblage of reasonable and commercially viable volumes, low capacity and suspicion of trader practices, and lack of knowledge and appropriate technology among industries on the technical and market aspects of cassava products poses serious challenges. Even though the demand for cassava products is rising, the market systems remain undeveloped.
- b. **Low Diversification of Cassava Uses:** currently, main cassava products are mostly used for direct human consumption at farm level. The inability to diversify the use of the cassava as a basic raw material for industrial and urban consumer use remains a major challenge. With changing focus from food to market diversification, such as the use of cassava in the livestock feed industry and bakery products, there is need to explore more opportunities to diversify cassava markets. This requires private-public partnerships, with the private sector investing in market development and procuring needed machinery, while the public sector provides the needed policy environment and physical infrastructure. The market diversification will also require strengthening the presently weak link between industrial processors and producers of cassava products.
- c. **Lack of access by farmers to quality planting materials for the improved cassava:** The yield stability and environmental development of cassava is highly dependent on the quality of planting materials, and the initial use of healthy cuttings is proven to be a very important factor in the subsequent attainment of good yields. Timely availability of large quantities of high quality planting material is a major factor in the effort to commercialize and industrialize the cassava commodity. Despite the release and availability of improved varieties, many are yet to be multiplied on a large scale and made available to farmers. JICA has commissioned a project to improve the flow and availability of improved cuttings.
- d. **Lack of an Integrated Production and Protection Management (IPPM):** As cropping intensification occurs, with more continued cropping of cassava on the same areas of land, the likelihood of soil fertility problems and new pests and diseases becomes more prevalent and can cause substantial yield losses. There is at the

moment an absence of a comprehensive IPPM package that would provide a good basis improved enterprise management.

- e. **Lack of improved Processing and Storage Technology:** Cassava products have rapid perishability and should be consumed or marketed soon after harvest or processed into "more stable" products (chips, flour, starch, gari), which can be safely stored for longer periods. These later, need to be further processed or transformed into commercially appealing products. Cassava drying poses the greatest challenge as it take long to complete, and is a key process for making virtually all cassava products. Other constraints to cassava processing include absence of efficient dryers, peeling machines and pelletisers. Lack of industrial processing facilities limits the potential to use cassava as industrial raw material. Momentum is gaining in that direction and needs to be supported.

2.0 THE CASSAVA VALUE CHAINS STUDY

2.1 Introduction

Supply chains are changing rapidly, tilting towards transactions that increasingly involve coordinated links between farmers, traders, processors and retailers. Traditional marketing channels with adhoc sales are being replaced by coordinated links in the marketing chain. Consumers are becoming choosier and enlightened as well as more demanding in terms of safety and quality of products. Linking organisations have realised this and are working towards improved linkages of farmers to markets. The approach advocates linking farmers to markets and development of long term business relationships rather than adhoc sales.

This report examines the status quo regarding how cassava farmers in Zambia link in with markets and how different players at various stages of the cassava value chains benefit from value adding initiatives. It examines, at various stages, the value adding practices and returns to them, constraints faced and how they respond to the linking or promotional efforts or supportive organisations as well as the enabling environment prevailing.

The preceding sections indicate that cassava is an important food and cash crop not only worldwide, but also locally. It is a significant source of calories in Zambia, and increasingly among urban consumers in Zambia. Even though it is well established within the private sector market chains, the market links are often not well defined with frequent cases of market failure. The critical gap for Zambia, especially, has been the lack of a comprehensive results-oriented and market driven commercialization strategy that mobilizes scarce human, material and financial resources to systematically address the constraints to increased competitiveness of various cassava utilizing value chains.

Commercialization calls for effective public-private partnerships that would quickly expand access to market-desired high yielding varieties, propagate labour-saving production and processing technologies and mechanization, enhance technology transfers, develop efficient well-integrated production and marketing systems, motivate market-oriented investments in continuing Research & Development, and provide efficient and sustainable technical assistance and extension services. All these respond to the growing market demand for cassava-based products, whether for food or industry.

Commercializing cassava and integrating smallholder producers and traders into commercial value chains is a surmountable though challenging and slow proposition, especially in Zambia. It is realistic to expect that with the right approach and leadership, stakeholders could be sufficiently mobilized and capacitated to harness the right value-chain focus, mobilize the necessary results-driven partnerships, and forge market linkages and promote effective institutional frameworks for sustainable commercialization of cassava in Zambia.

In this regard, the Zambia office of the Food and Agriculture Organisation (FAO) has prioritised the cassava as a sub-sector for commercialisation interventions. FAO is providing advisory services to the Ministry of Agriculture and Cooperatives (MACO) through partners such as Programme Against Malnutrition (PAM) and others, in conjunction with like minded agencies like World Food Programme, Programme for Livelihood Advancement and Rural Development (PLARD) and Agriculture Consultative Forum (ACF), to strengthen their joint interventions in the different targeted cassava value chains.

In order to achieve meaningful results and benefits, there is need to identify and address some of the key bottlenecks faced by various players at the different levels of the different cassava value chains with respect to in the mobilisation of resources for the production, processing, marketing and utilisation of cassava. FAO in Zambia sanctioned this study to provide an input into the stakeholder dialogue processes and project implementation pinpointing challenges and opportunities within the identified and prioritised cassava value chains.

2.2 Concept and Process of Value Chains Analysis

2.2.1 A Paradigm Shift and Chain Reversals

A strategic collaboration of organizations for the purpose of meeting specific market objectives over the long term and for the mutual benefits of all 'links' of the chain

Agri-food value chains increase competitive advantage by linking producers, processors, marketers, food service companies, retailers and supporting groups such as transporters,

research groups and suppliers. Companies link their field production practices with supermarket sales to form value chains with key suppliers of various agricultural products. They work with their suppliers over the long-term to improve quality, consistency and safety of its food supply.

A value chain is a market focused collaboration that works through the chain, perhaps linking farmers with processors and marketers; different business enterprises working together to produce and market products and services in an effective and efficient manner. The value chain is also an extended enterprise based on the premise that when

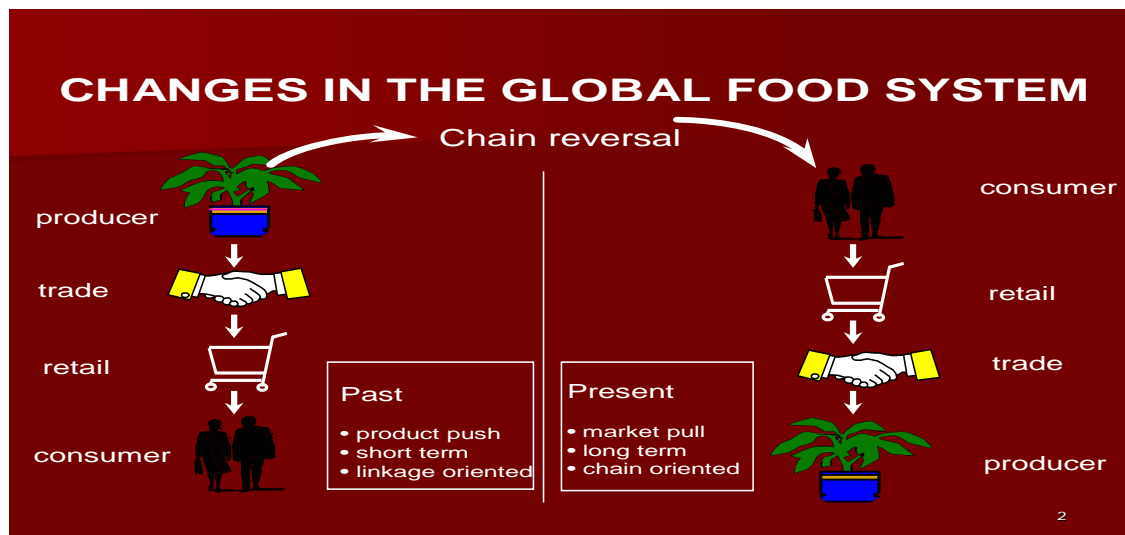
the chains products and processes are difficult for others to copy, the value chain has a competitive edge. Value chains provide a unique way to manage risk by all players. Buyers are assured a supply of desired products and are able to trace the food back to the

Value chain relationships are based on extensive information sharing, primary focus on value and quality rather than cost, differentiated product, demand pull power relationships, interdependent organizational structure and a philosophy of chain optimization.

farm of origin, while suppliers are more assured of a market. Value chains can improve access to a market and reduce the time it takes to respond to changing customer demands.

As vertical alliance of enterprises, allowing for collaboration to achieve a more rewarding position in the market, businesses are connected from one end of the production process through processing and marketing, allowing consumers to purchase a desired finished product. The businesses, while still legally independent operations, become interdependent, collaborating or discussing issues and problems together. Chains are developed to respond to the demands of the marketplace. Interaction with the marketplace provides information to decision makers for every link in the chain. A well-functioning value chain provides the means to effectively link production activities to market demands. In this new market culture, the paradigm shift from an emphasis on producers to focusing on consumer needs drives decision making. Long-term chain oriented market pull forces outweigh short-term product push.

Figure 3: Changes in the Global Food System



Source: FAO-AGSF, 2007

Traditional business relationships have been characterized by little or no information sharing, a primary focus on cost, a commodity orientation, supply push power relations, independent organizational structure and a self optimization philosophy. In contrast, value chain relationships are based on extensive information sharing, primary focus on

value and quality rather than cost, differentiated product, demand pull power relationships, interdependent organizational structure and a philosophy of chain optimization.

It is increasingly being recognized and advocated that agri-food producers, processors and retailers should no longer compete as individual entities, rather, they should collaborate as strategic value chains and compete with other value chains in the market place. Value chain has recently emerged as a popular business term. Given the difficulty in creating and maintaining value in an intensely competitive world of changing markets and technologies, businesses are now forming value chains to meet new demands and remain viable. Companies find it difficult to *go it alone* in these circumstances. They find strength and security in a customer-focused chain that might begin in a farmer's field and end in the supermarket.

2.2.2 Value Chain Analytical Model

Sub-sector analysis identifies the different channels within the overall sub-sector (cassava) and then looks at the competitive relationships between those channels. Always get the whole picture first (sub-sector analysis), then decide on specific value chain(s) and implement value chain analysis. Value chain analysis looks at one market channel only. In Zambia's cassava sub-sector, the main value chains are flour, stock feeds and baking.

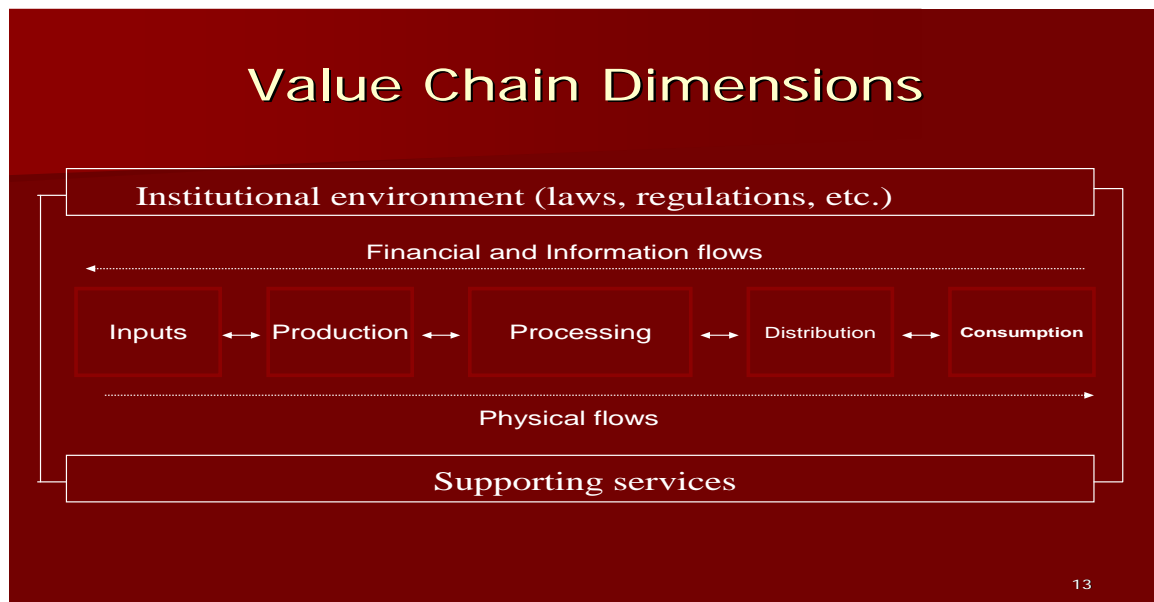
An analysis of value chains should examine what keeps the chain bound together: markets, contracts, strategic alliances, joint ventures, franchising, networks, cooperatives and vertical ownership. An analysis of value addition processes can be broken into various perspectives:

- **Value Creation:** Generating something that someone else is willing to pay for.
- **Value Capture:** Retaining a portion of the added value.
- **Value Decay:** Reduction in the added value over time
- **Value Sharing** in a value chain: Arrangements used to share added value between the value creator and user.

Players can capture margins by reducing the cost of an activity or shrinking the cost of the plate. They can also capture margins by creating value through better products, providing more services or lowering the cost to the customer. Value can also be created by better linkages with customers; joint creation of more value for downstream customers, sharing the increased margin and establishing tighter linkages that are more sustainable.

Of late, there has been an increase in use of value chain analysis to design programs that integrate small enterprises into markets and develop a clearer understanding of the value chain dimensions (Figure 4).

Figure 4: Value Chain Dimensions



Source: FAO-AGSF, 2007

2.2.2 Sub-Sector Selection and Value Chains Prioritization

This study selected the cassava sub-sector to target as given, given the potential importance of cassava in Zambia's livelihood systems as discussed in Chapter 1. This is further consolidated or supported by various studies as reviewed in Part 1 that highlighted the importance of the cassava sub-sector. Cassava offers promising opportunities for small enterprise development and its selection is validated as follows: (i) Cassava offers a great business opportunity and potential to create markets for various specific value chain products with rising demand; (ii) Cassava is important in the livelihood systems of 30% of Zambians, especially the northern and western parts that have competitive advantage. These observations have been noted in various reports, policy documents and forums of stakeholders.

The identification of specific value chains of interest from a potential range of globally accepted chains is the next step. Section 1.4 listed the value chains of much interest in Zambia. But in a realistic assessment of attempts to incorporate small enterprises and the poor into cassava value chains, and based on dialogue with stakeholders, high potential

cassava value chains to pursue and analyse for possible promotion include: (i) **Animal feeds** and (ii) **Flour** for bakery products and human food. Their selection is based on familiarity and simplicity of technology and institutions for promotion, potential viability and political will for support. Analysis of these chains follows in this report. The next section describes the objectives and methodology employed in this study.

2.3 Study Objectives and Methodology

2.3.1 Objectives of the Study

The main objective of the cassava value chains study was to identify priority cassava value chains and reveal indicative patterns and trends, assess capacities and identify key constraints at various stages with a view to inform the cassava commercialisation programme.

The study will focus on assessing the performance of the chain in terms of value added at each stage, the level of returns to chain participants and whether these are exploitative compared to primary producers, the level of competitiveness in the chain at each stage and the major challenges and constraints faced. The approach to this assessment of the chain performance aspects is described in Table 5 and as outlined in steps 1 to 4 below.

2.3.2 Methods Used

The study was conducted in the project area (Serenje, Samfya and Mansa), targeting farmers, traders and processors, as well as in urban Lusaka targeting traders, retailers, processors and consumers.

The analytical framework and the matrix presented in Table 5 informed the process of data and information collection. Based on the identification and targeting of various players and their roles, practices and capacities and opportunities, needs and constraints as well as viable solutions, a step-wise analytical framework was developed:

Step 1: Sub-Sector Selection – As highlighted above, cassava was already prioritised as a sub-sector with potential to stimulate growth for increased smallholder farmer and SME income and employment. In order to verify the viability of the sub-sector, the research team collected data and analysed the gross margins at farm level based on current market conditions. It also analysed through market margins, the impact on traders and processors. Data on production at household and community levels was collected using questionnaires for producers and traders/processors.

Table 5: Analysis in the Cassava Sub-Sector and Value Chains

PARTNERS/ RESPONDENTS	IDENTIFY THEM	DESCRIBE THEIR PRACTICES/ROLES/CAPACITIES	IDENTIFY THEIR NEEDS AND OPPORTUNITIES	VIABLE SOLUTIONS AND INTERVENTIONS
Institutional Environment		Checklist	Checklist	Checklist
Laws, bye-laws and regulations; Macro economic and trade policies; Incentives for investment; Development plans for production and market infrastructure				
Supporting Services		Checklist	Checklist	Checklist
Inputs suppliers (seed and chemicals); Credit and financing suppliers; Extension providers; Research services;				
Cassava producers		Questionnaire	Questionnaire	Questionnaire
Smallholders				
Procurement, Processors, Distributors, Wholesalers, Retailers and Exporters		Questionnaire	Questionnaire	Questionnaire
Buyers and traders; Processors				
Consumers		Questionnaire	Questionnaire	Questionnaire
Restaurants; Retail shops; Urban consumers; Industrial consumers				

Step 2: Sub-Sector Operations and Performance – In order to gain a greater understanding of the operating context of SMEs, the market players involved, their roles, and interrelationships were examined. Through this analysis, the roles, conduct, capacities and constraints of supportive institutions was brought out.

Step 3: Identification of Constraints and Opportunities – In order to determine key issues hindering growth and competitiveness in the sub-sector and each value chain, column 4 analysed and summarised the key constraints and opportunities of each player in the value chain. This data was captured through the questionnaires and checklists for each value chain stage.

Step 4: Identification of (Potential) Commercially Viable Solutions – Following the determination of which constraints, it was then determined and analysed as to which solutions were required to address the priority constraints identified in Step 3 at each stage of the cassava value chain. The analysis in Column 5, lead to the identification of potential interventions and viable and practical solutions. These formed the basis for recommendations.

2.3.3 Sampling

The cassava farmers and traders were purposively selected as typical case studies to collect detailed data on each to enable the calculation of gross margins and to build profiles describing their activities, inputs, outputs, profitability, marketing, constraints

and opportunities. A total of 82 respondents including case study producers and traders from the three target districts and in Lusaka were selected using simple random sampling.

Purposive and random sampling was used to select other respondents in the value chains such as traders, wholesalers, processors and consumers to provide data to enable calculation of marketing margins and build profiles on their practices, constraints and opportunities.

2.3.4 Data Collection and Analysis Methods

In view of the richness of prior work and studies on the subject of cassava, the study was divided into two parts: **Part 1: Literature Review (Report available)** for identification of data gaps for information required for value chain analysis. This informed and influenced the size and methods of **Part 2: Field survey for value chains analysis**. Full questionnaires and checklists were developed as indicated in Table 5. Data collection was done using a research assistant in urban survey and three assistants who are project based to collect data at district level.

Data analysis focussed on describing the system patterns and trends and analysing constraints and opportunities. The performance of the cassava production system was measured using **gross margin analysis**, while that of the intermediaries used **market margin (value addition) analysis**. Consumer trends, patterns and preferences were also analysed. The Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis was used to analyse each value chain. The research assistants were trained and supervised by the principal researcher. The Team is very grateful for the able assistance and facilitation rendered by **Mr. Ronald Msoni, project Manager** and the FAO Representation team for their support.

2.3.5 Main Weaknesses and Study Limitations

Due to resource and time limitations, the study relied on case study approach to data collection and no systematic sample survey was possible. Data was also collected through literature review and secondary data sources. Due to the sensitivity of issues of business, there was a high rate of refusals among some traders and processors, failing to provide data or respond to interviews. Urban traders were wary of possible police harassment. There was also a lot of ignorance expressed about the role of cassava in their enterprises. As a result, the Team made some anonymous visits to various shops, markets and trading outlets in Lusaka, Samfya, Serenje, Mansa and to observe patterns of negotiations, pricing and obtain market intelligence data. There was a lack of reliable and latest data on cassava production, trade and marketing from MACO and CSO.

The Team collected data from the provinces and Lusaka between December 2007 and January, 2008. Despite the weaknesses cited above, the Team considers the data collected from 82 respondents was of sufficient quality to allow both quantitative and qualitative analysis.

2.3.6 Literature Review: What information is available?

The analysis of gaps in available information on cassava value chains and market channels was reported in Part I of this survey and a report has been produced. There is quite a rich base of information and studies conducted both globally and locally. This information allows for analyses and computation of general enterprise budgets, and to derive gross margin analyses. However, availability of localised information to the project area is still patchy, worsened by lack of official statistics and studies at district level. The literature reviewed did allude to and identified some priority value chains worthy of promotion, but in most cases, an analysis of main constraints and identification of potential interventions at each market stage of the identified value chains is not fully elaborated. The argument and conclusion of the gap analysis phase is, therefore, that even though a wealth of data and information already exists to enable the comprehensive analysis of the priority cassava value chains, specific deficiencies in these data required localised field verification with farmers, traders and supportive institutions.

There exists a rich volume of information on global and national policies affecting cassava. The IFAD-FAO initiated Global Cassava Development Strategy, forms the global framework for cassava promotion and advocates mainly the expansion area planted and increased productivity, including the use of biotechnology. The African Ministers of Agriculture have recognised the role of cassava, based on success stories of improved cassava productivity emerging from West Africa. Nigeria recently replaced Brazil as the world's leading cassava producer with recent research contributions from the International Institute for Tropical Agriculture (IITA). They note that Africa's cassava transformation has proven to be its most important poverty fighter to date. Extending this success to additional African countries is the objective of the NEPAD/CAADP Pan Africa Cassava Initiative. The case of Thailand on transformation of cassava into a money spinning industry is also provided. The basic tenet is that a competitive marketplace (local, regional and international levels) is rapidly changing cassava's roles in development. In reviewing the role of cassava as a catalyst for development, three main pillars of intervention are advocated in order of priority, but in a complementary manner:

1. Market Development: Stimulating higher demand for cassava products.
2. Process and Product Development: Adding post-harvest value.
3. Improved Production Systems: Increasing efficiency and profitability for farmers.
4. Institutional Support.

Like-minded stakeholders have established a Taskforce for Acceleration of Cassava Utilisation (ACU) that is working on cassava value chain development, with emphasis on livestock feeds, processed foods and trading standards, as well as trying to resolve issues that affect commercialisation of cassava.

3.0 FINDINGS OF THE STUDY

3.1 Cassava Production and Distribution Channels

The analysis that follows is based on national level production of 1,056,000mt of flour (equivalent to 4,224,000 mt fresh weight at a conversion factor of 25% extraction rate). The existing flow and transformation (value adding) of these volumes from the farm level market to the consumer is traced out in **Figure 5** based on a model developed by the ACU/ACF. The upper level estimates of consumption volumes are not very reliable due to lack of comprehensive data and response from the industry. Subsistence consumption estimates include inter-household trade, barter and exchange within communities. The figures on exports do include informally traded cassava across borders.

Figure 5: Cassava Market flow Channels

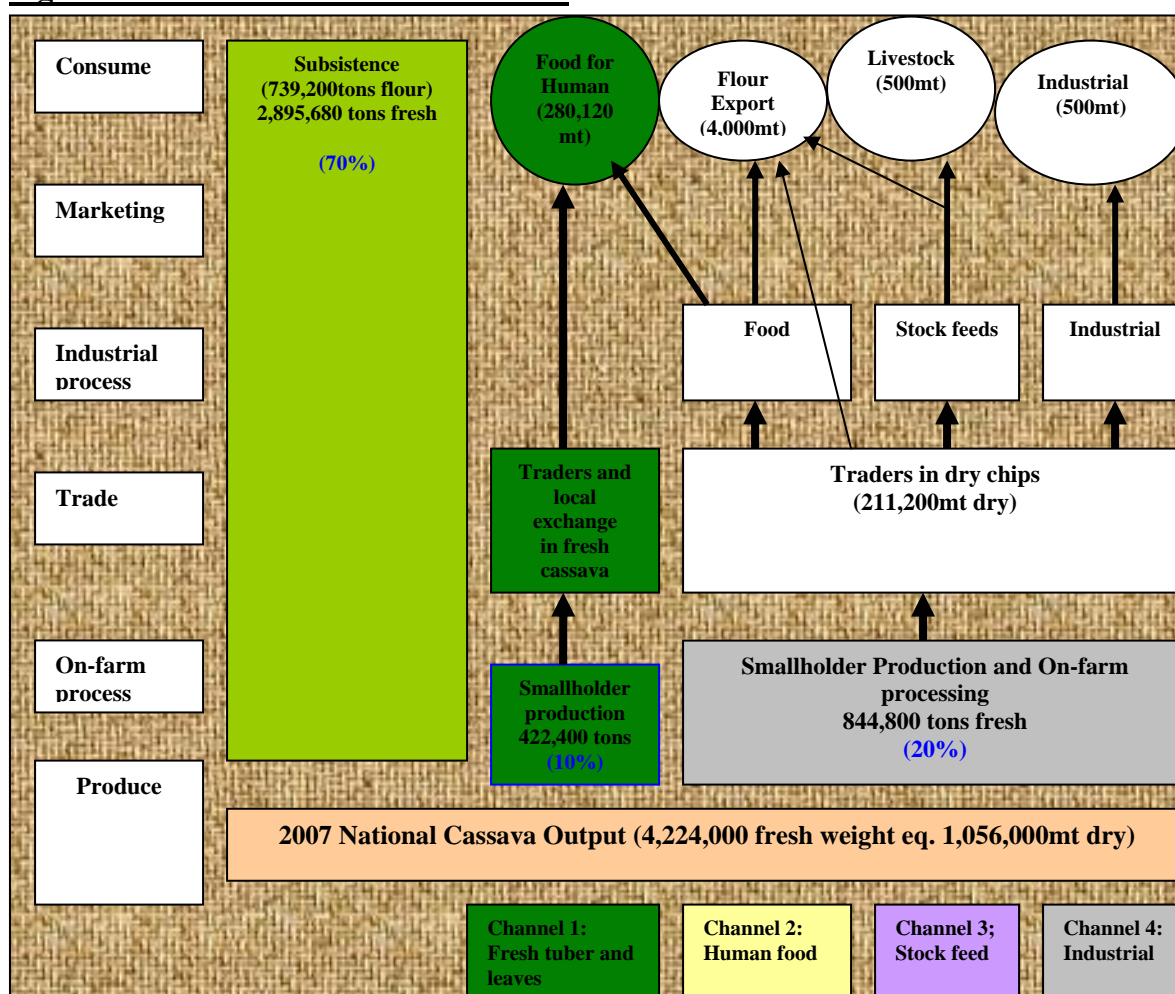


Figure 5 indicates that cassava produced is retained for subsistence consumption on the farm. There is a huge gap between produced and traded volumes, highlighting the high potential to commercialise. Over 70% is estimated to be consumed locally within the communities. This also includes wastage and spoiled cassava in-situ (quality loss in ground), peeling, soaking and processing. This study estimates based on farm-level data that 30 percent of cassava produced is traded.

Channel 1: Fresh Tubers: This enters the market as fresh tubers (10%) targeted at local exchange or barter, roadside sales and urban consumer markets where is consumed it as snacks. The main varieties are sweet varieties that are either boiled and sold as snack or roasted. Farmers and traders bring the fresh roots to urban markets and sell them to urban consumers and middlemen.

Industrial Processing: the other 20% traded cassava enters the market channels as processed as chips and flour, targeted at urban domestic consumers (**Channel 2**) and industrial consumers for stock feeds (**Channel 3**) as well as high value cassava flour (HVCF) and starch (**Channel 4**). It is very difficult at this stage to disaggregate the volumes by each of these channels due to lack of feedback data. But these channels are the main focus for any efforts to commercialise cassava through capacity building. Expansion of these channels and value chains is the main focus of commercialisation.

The analysis that follows will be structured to trace the flow of cassava through the various market channels from the farm level in the project target areas to the consumers in urban areas, focussing on the two main cassava value chains; i.e. flour and stock feeds. Local consumption at farm level is not analysed as it is not the focus of the value chain analysis. However, increased consumption of cassava in non-cassava producing areas such as Southern, Central, Eastern and Lusaka provinces can go a long way in expanding demand and commercialisation and should form part of commercialisation strategies.

3.2 Cassava Production and Productivity in the Target Areas (On-farm)

In the section below, the target districts are profiled based on formal CSO data and interviews with key stakeholders in the field. This information is important to estimate the volumes of cassava produced and marketable from the target area. The proportion of households selling is important to estimate the volumes entering the market chain are important as a basis for calculating marketable amounts. Table 6 shows some basic district level parameters. Annex III shows a district-based profiling of cassava production practices among the farmers and stakeholders interviewed.

Table 6: District Distribution of Cassava Production Parameters – 2005/6

District	Area Harvested (Ha)	Production (MT)	Cassava Farmers	Yield Mt/ha	% HH selling
Serenje	6,500	16,250	6,135	10.0	30

Samfya	22,032	79,899	11,635	11.7	70
Mansa	18,312	71,862	35,000	11.7	50

Source: MACO Interviews and CSO, 2007

Table 7 summarises the case study farmers interviewed in the districts visited into a farmer profile. Farmers cultivate sizeable pieces of land averaging four hectares. This is skewed by high figures from Samfya. At any one time, about half of the cassava fields are ready for harvest. The average yield at 9,992 kg/ha is in line with national estimates.

Table 7: Cassava Productivity

District	Serenje	Samfya	Mansa	Total
Case studies	8	8	9	25
Km from Town Centre	82	93	98	91
Mean Hectares cultivated (ha)	1.6	6.0	4.3	4.0
Mean Hectares read to harvest	0.7	2.1	2.1	1.7
Percent mature to all cassava	42	44	49	45
Mean yield/ha	17,787	4,915	7,576	9,992
National mean yield				12,000
World Average				20,000
Research yield				35,000
Chip/Flour equivalent kg	4,447	1,229	1,894	2,498
Leaves harvested – kg	255	880	388	503
Farm-gate Price /kg Fresh tubers	296	1,798	1,439	1,125
Farm-gate Price /kg Flour/Chips	544	2,122	1,447	1,446

The key production inputs are family labour, hired labour, stem cuttings and packaging. No farmer applied either fertilizer or chemicals. MACO estimates ha 150 man days are required to cultivate a hectare of cassava.

The performance of the cassava enterprise at farm level was assessed using gross margin analysis. This is the difference between the gross incomes or revenues from cassava as a farm activity and its variable costs, estimating the returns above variable costs. The gross margin analysis in a simple and practical way helps to assess profitability of cassava enterprise in Zambia (Table 8).

Table 8: Cassava Gross Margin per hectare

District	Serenje	Samfya	Mansa	Total	Raw Tubers
Quantity of flour produced (Kg)	2,801	2,539	9,295	5,055	9,992
Price (K/Kg)	545	2,122	1,447	1,446	1,125
Gross Income (K)	8,005,731	17,277,089	8,108,121	11,405,058	11,241,000
Variable Costs (K/Ha)	304,250	473,950	243,444	336,664	304,250
Gross Margin (K/Ha)	7,701,481	16,803,139	7,864,621	9,911,333	10,936,750
Return to Labour (150 man days)	51,343	112,020	52,430	66,075	72,912
Return to Capital (%)	25	35	32	29	36

The return to family labour at K66,075 means that cassava farming pays the farmer daily wage rate way above prevailing wage rate of K10,000.00. Investments into cassava production for flour gave returns ranging from 25 to 35% compared to prevailing bank interest rates of about 20 percent. These computations are based on average parameters

from the case studies. This is quite attractive and indicates that cassava is a viable enterprise.

Since the main products sold are chips and flour that are already processed on-farm, value addition at the farm has taken root. This is opposed to selling raw tubers at the farm level which seemed to pay more as opposed to adding value. This is because the relative price of raw tubers is higher than processed cassava. However, raw cassava has more risks of loss due to perishability and weight.

In conclusion, even though cassava growing and selling shows attractive returns, the markets remain undeveloped and price discovery is poor. Gross margin returns are therefore vague and as they are not competitive while marketing remains largely opportunistic and localised. The main constraints to expanded cassava production are that compared to other cash crops, its markets are very restricted and localised in characters and returns.

Because of poorly undeveloped markets for cassava, late planting is practiced and this leads to low yield. As long as markets can only accommodate 30% of produced volumes, farmers will put priority on planting more important cash crops before cassava. This calls for promotion of early planting and adoption of improved varieties. Other constraints are distant markets and lack improved processing technology.

3.3 Analysis of Cassava Marketing and Trade (from Farm to Retailer)

3.3.1 Profile of Cassava Traders

3.3.1.1 Fresh Cassava

The bulk of the fresh tubers sold were for further processing and drying into chips and flour mostly within the community. Some is sold as snacks on roadside markets. Only a very insignificant amount of fresh cassava leaves the target area to urban areas. This can be explained by high perishability and bulk. This chain remains insignificant and very limited in scope for farmers in Serenje and Luapula, especially in relation to urban markets.

3.3.1.2 Chips and Flour

An analysis of the characteristics of the seven traders indicates that they are middle-aged males most of them with a long history and experience in trading. All the traders interviewed were male with average age of 44 years, youngest was 33 and oldest was 67 years. Profiling of case studies of the traders is done Annex II. Some are farmers resident in their local areas, while others are full time traders. The only female traders were detected selling end products in Lusaka. The case studies in Table 9 reveal that the marketing channels for flour and chips is quite advanced and relatively well developed.

Whether it is competitive is in doubt given the low volumes bought in relation to the produced cassava. The main players in trading are the farmers, small and medium scale traders as well as roadside motorists who buy, process and transport with a view to supply urban markets. The level of competitiveness and profitability as influenced by various cost items is indicated in the analytical section below.

The data on cassava prices is unreliable and both FRA and MACO figures do not reflect seasonal price fluctuations with changes in demand. Farm-gate prices seemed to be quite uniform at about K30,000 per 50kg bag of dry chips or flour. The selling price in the market was also quite comparable in different markets, i.e. fishing camps, Mansa and Lusaka/Copperbelt at about K55,000 to K60,000 per 50kg bag of dry chips. This fact disadvantages selling in Lusaka considering the high marketing costs and this was reflected in the low return for the Lusaka market. On the other hand, the Congo D.R. market was very lucrative with returns over 200 percent. This is on account of good market price despite high marketing costs. The seasonal price fluctuations at farm and market level were not monitored due to lack of data. However, it is probable that in the fishing camps, prices change drastically during rainy season when supplies are low. FRA has faced difficulties offloading its procured supplies at any reasonable price. No graphical analysis of price was possible due to lack of reliable data.

Table 9: Analysis of Traders Practices

Aspect	Case Study							Mean
	1	2	3	4	5	6	7	
sex	m	m	m	m	m	m	m	
Age (yr)	42	62	33	40	38	38	56	44.14
Experience(yr)	10	10	15	4	7	12	13	10.14
Residence status(local or outsider)	l	l	o	o	o	l	l	
Is trader a Farmer	no	yes	no	no	no	yes	yes	
Product bought	chips	Fresh, chips	Fresh, chips, flour	Chips, flour	Flour, chips	Chips	Fresh, chips	
Volume per trip(50kg bags)	20	40	3,750	1,500	1,000	15,000	7,500	4,115.71
Farm-gate price (K'000) per 50kg	30	30	30	30	30	15	30	27.86
Trips per year	2-3	2-3	continuous	12	2-3	2	1	
Target market	Fish villages	Fish villages	Mansa/Samfya	Fish villages	Fish villages	Congo D.R.	Urban Zambia	
Capital ('000k)	400	1,200	1430	7,490	1,500	3,000	3,750	
Price sold (50kg flour)	50	60	60	60	65	150	55	71.43
Gross Income(K'000)	-	2,400	5,625	7,500	3,500	30,000	9,000	9,670.83
Transport (K'000)	100	90	400	400	300	5,000	375	952.14
Fare (K'000)	30	40	0	14	40	60	125	44.14
Process and package ('000)	105	700	1300	1440	520	400	2,250	959.29
Taxes(K'000)	15	20	20	30	50	50	300	69.29
Security (K'000)	15	0	50	0	0	300	30	56.43
Loading(K'000)	30	0	80	30	0	500	40	97.14
Living expenses(K'000)	50	20	100	70	100	200	200	105.71
Total Costs(K'000)	745	2,070	3,380	4,234	2,510	9,510	7,070	4,217
Net (K'000)	255	330	2,245	3,266	990	20,490	1,930	4,215.14
Return(%)	34	16	66	77	39	215	27	67.71

Most traders (83%) obtained their supplies direct from producers while the others (17%) bought from farmers and sold from their own produce (Table 8). The main forms of cassava supplied from farmers is dry chips, processed flour and raw. Sometimes traders buy the whole field, harvest and process themselves. But once, bought, traders transform the cassava mainly into processed flour and sell it into that form. The main buyers from traders are consumers within local communities, fishermen in fishing areas and consumers in Lusaka and Copperbelt provinces.

The transformation from primary cassava to flour is a valued adding process on the part of traders, including the transportation to consumption areas. The seven traders interviewed handled a total of 72 mt per year of dry chips/flour and only 5 mt of fresh cassava. The main marketing costs are procurement capital, transport, packaging, food, processing, levies and axes, loading and offloading.

Based on the case studies above, the average market margin in cassava trading is 96% (Table 9). This is the traders return on his investment. However, this figure is skewed by the high return from the Congo DR market. Removing the Congo DR market drops the return to 36.5%. The farm return on capital investment in cassava was estimated a 29% for flour and 36% on raw cassava. Even though the market margin is higher, one cannot conclude that this is exploitative. This means the cassava trader is not necessarily exploiting the farmer. Evidence of localise non-competitive behaviours is often exhibited by traders depending on how desperate the farmer's situation is. Traders will use barter to exchange cassava chips for industrial consumer goods at unfavourable terms of trade to the farmer. In some cases, thefts have occurred where the trader collected goods promising to pay for them later. Conditions prevailing at urban markets also tend to raise the cost of trading as urban market Kaponyas do not allow farmers to sell to consumers directly and often ask for commissions for offloading and selling.

The main constraints and challenges facing traders are numerous: high transport costs, packing, lack of proper market infrastructure and storage sheds, low retail prices, lack of established bulk buyers, poor roads to production areas, limited capital and lack of security. Apparently lucrative markets like the Congo DR are difficult to access. Judging from the market margin level, the urban market is not attractive enough. This is why the local fisher folk market remains the most viable and dominant. Table 10 and Figure 6 show the proportion of different cost components as a proportion of marketing cost.

All traders were interested to join a traders Association through which he could access beer access to he means transport, soft loans for working capital, common and improved market infrastructure, linkages to organised markets and lobbying for beer trade conditions.

It is apparent that traders have a close relationship with producers and many of them intersect as both farmers and traders. Many are experienced and are skilled in negotiations and price monitoring. They have knowledge of cassava production, grading

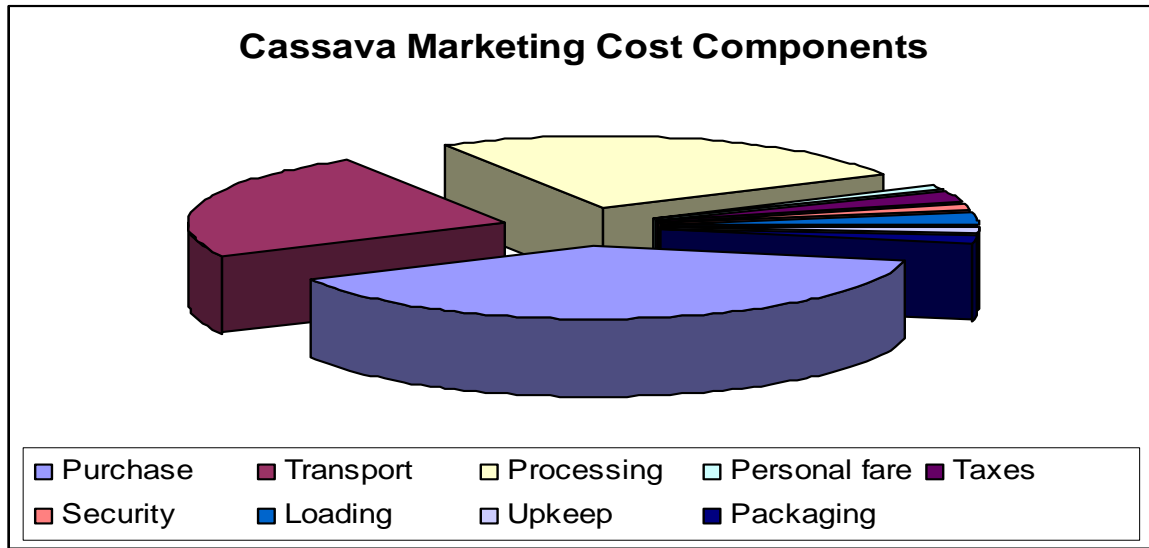
and standards. But in their present state, traders remain too weak and disorganised to form a good basis for strengthening value chain linkages to industry in urban areas.

Table 10: Cassava Marketing Cost Components

Cost component	1	2	3	4	5	6	7	Total	%
Volume (kg)	1,000	2,000	3,750	1,500	1,000	15,000	7,500	31,750	
Market	Fishers	Fishers	Fishers	Fishers	Fishers	Congo	Urban		
Purchase	400,000	1,200,000	1,430,000	2,250,000	1,500,000	3,000,000	3,750,000	9,783,750	39
Transport	100,000	90,000	400,000	40,000	30,000	5,000,000	375,000	6,035,000	24
Processing	105,000	700,000	1,300,000	1,440,000	520,000	0	2,250,000	6,315,000	25
Personal fare	30,000	40,000	0	14,000	40,000	60,000	125,000	309,000	1
Taxes	15,000	20,000	20,000	30,000	50,000	50,000	300,000	485,000	2
Security	15,000	0	50,000	0	0	300,000	30,000	395,000	2
Loading	30,000	0	80,000	30,000	0	500,000	40,000	680,000	3
Upkeep	0	20,000	10,000	70,000	100,000	20,000	200,000	420,000	2
Packaging	0	0	0	0	0	400,000	0	400,000	2
Total	695,000	2,070,000	3,290,000	3,874,000	2,240,000	9,330,000	7,070,000	24,822,750 24,822,750	100

It is required that the FAO and other partner **projects** work to organise traders into solid groups or associations and empower them with loans and facilities for them to conduct effective trade linkages. Consideration to provide transport loans, training business and marketing skills, standards and provision of farm level processing machinery is required. MACO should provide traders with information on sources of cassava supplies and demand conditions. Cassava should be included in the ZNFU SMS market information system.

Figure 6: Cassava Marketing Cost Components



3.4 Analysis of Cassava Processing and Retailing

3.4.1 On-Farm Processing

The previous section revealed that cassava is an integrated enterprise, sometimes combining production, processing and retailing. It also came out that many community level processing facilities (on-farm) exist but quality and labour demand is a constraint. The need for improved on-farm processing technology was thus recommended above. Table 10 shows the proportion of processing cost to marketing cost is 25 percent and can be as high as 38 percent.

In an effort to gain a higher margin through processing and transporting cassava to markets, local milling is done before selling cassava to consumers or traders as flour. This milling formed a significant part of the total marketing cost. Since on-farm facilities and technology for processing is not well developed, farmers take their cassava to cassava mills and pay a fee for milling. But as we shall see later, most of these mills do not produce a good quality milled cassava product capable of fetching good prices. The small cassava mills are found scattered in all the districts visited. But as revealed in interviews, there seems to be low milling capacity.

3.4.2 Off-Farm and Industrial Processing and Retailing

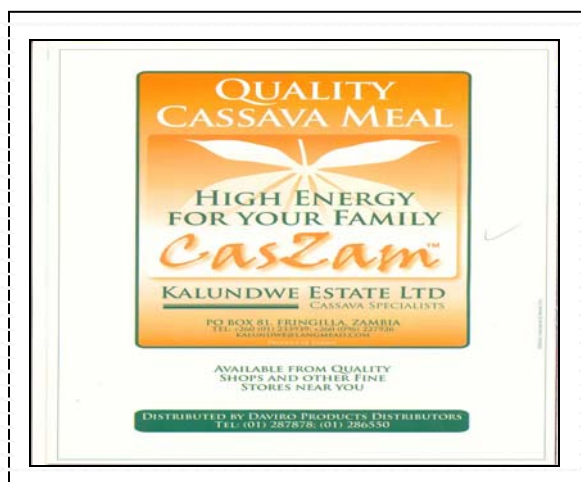
3.4.2.1 Cassava Flour Processing and Retailing

One encouraging factor is however, that there is a flourishing expansion of commercial millers specially packaging branded cassava flour (see cover photo and Case Study 8). This cassava is being well displayed and stocked in major supermarkets as branded, graded and well packaged cassava flour. Almost all major supermarkets and retail shops now stock cassava flour. The emerging cadre of processors are grinding and packaging flour for sale to retail shops (Table 11).

Table 11: Cassava Brands on the Zambian Market

Cassava brand	Manufacturer	Stockist	Pack size	Pack Price (K)	Information included on Pack
Cassava Flour	Siumi Miller	Roberts and Fish and Vegetable Shop	1kg	4,500	How o prepare and store
	Puliandale Farms	Roberts and Fish and Vegetable Shop	1kg	4,500	None
CASZAM	Kalundwe Estates	SPAR	1kg	3,800	Nutritional
CHIMS Cassava Meal	Chimumba Farms	SPAR	5kg	14,350	None
Top Value Cassava Meal	Valle Side Farms	Roberts and Fish and Vegetable Shop	2kg	10,000	None
Chukwuma Cassava Meal	Chukwuma	Whole sale	5kg	12,000	None

In Mansa, the World Food Programme (WFP) is constructing a Cassava Milling Plant contracted o PAM to mill 250 tons of cassava flour per month (or 3,000mt per year). Farmers in other provinces like Copperbelt are crying for similar mini-facilities.



Grades and Standards: An important issue related to the competitiveness of cassava products is the issue of grading, sorting and packaging of cassava products that are still developing in marketing in Zambia. Packaging provides a convenient container for the product to be handled, protects the

products from damage and it provides a convenient way to arrange for retail sale. ACU together with Zambia Bureau of Standards (ZABS) have been developing standards for cassava marketing.

By the existing laws, processed food like cassava must be labelled and should give the following information:

- Brand or trade name, if any
- Common name of the food
- Net contents in terms of weight, volume or number
- Ingredients, in descending order of their proportions
- Coding and date marking (if required)
- Name and address of manufacturer, packer, distributor, importer, exporter or seller
- Sell-by date
- Special storage conditions (if applicable).

Interviews with various restaurants and hotels revealed a less than encouraging scenario of cassava flour consumption. Many of them mentioned the lack of international appeal of cassava as food as the reason for not including it on their menus. Lusaka Hotel had tried cassava meal but, *“it became expensive to continue to serve cassava-based meals to a very few customers that would only show up occasionally, it is not popular”*, according to the Food and Beverage Manager. Others bemoaned the erratic supplies. But a few are willing to experiment like Protea Hotel (see Case Study 9). Most restaurants simply have not tried it because they are not sure of customer base.

Case Study: Use of Cassava Flour in Protea Hotel

Protea hotel is one of the new upmarket hotels located in the centre of Lusaka Central Business District (CBD) on Cairo Road. The hotel's management buy cassava flour served as nshima for lunch menu. The quantity bought is not predictable as demand is irregular. The hope to maintain the same levels as demand seems on the increase. A wide spectrum of people including aged, youth, rich, poor, women and men do make occasional request for cassava-based meals. Cassava is liked because of taste and flavour.

The hospitality industry (hotels, restaurants and eating places) are becoming significant players in the cassava value chain. The lack of information on customer preferences, nutrient value and diversity of dishes makes these institutions prefer established foods. The other value adding retailers are in the hospitality industry, including hotels and restaurants. Both cassava flour and cassava leaves are becoming popular among urban consumers. Silva Catering, Matebeto and others report good business and trade for cassava products and other traditional foods. People have realised the value of going back to the roots.

3.4.2.2 Cassava – Based Confectionery and Baker Products

This section focuses more on the current state of processing for potential industrial and urban consumer applications such as high value cassava starch, baking flour, food processing and animal feed (millers). The study was surprised by the high level of ignorance of possible cassava industrial application by established industry. Save for some experimentation by Tiger Animal Feeds and Confectionery industry, little progress has been made to adopt and integrate cassava into industrial products. Products like cassava bread, cassava-wheat bread, pies, sausage rolls, cocktail snacks, strips, cakes, cookies and biscuits are not yet integrated cassava. Most of the cassava from farmers is therefore targeted at the urban informal markets for flour and not industrial processing.

The bakers, confectioners and bread manufacturers interviewed indicated ignorance about the value and efficacy of cassava and the technology of mixing it with wheat flour for baking. Capacity building and information provision is required for this group of consumers. Many felt that cassava bread would not sell, but that suitable mixtures should be tested. Simba Milling specifically asked for samples of cassava based bread and confectioneries. They had done some experiment on cassava but had not produced conclusive results. People did not seem to like the taste or flavour of cassava based confectionery products. Harriet's Bakery recommended a wide consumer survey with testing of samples of different mixtures. But Silva Food Solutions has gone quite far in integrating cassava into their products (see Case Study 10).



Case Study: Use of Cassava Flour in Silva Catering Products

Silva Catering is a pioneer in traditional food development. Cassava has been taken aboard and all products (leaves and tubers) are processed and utilised. Cassava flour is used and mixed with wheat to produce bakery and confectionery products. Silva has opened linkage with producers and trains them in processing, preservation and packaging. They have embarked on market research a local and international level for these traditional products. They reckon the whole spectrum of consumers like well processed and packaged food products. They aim to maximise the harvest and availability of nutrients from traditional foods for consumers.

Silva thinks the current focus on maize promotion should be dropped in favour of cassava as it has more utilities, it is easy and cheap to grow and can be mixed with many cereals to produce current consumable products. Intensive and sustained media campaigns on Radio and TV coupled with workshops on the benefits of cassava are required. A food policy that recognises cassava is required urgently to back up promotional efforts. There is need for more investments and possibly subsidies to promote cassava as an industrial raw material. Allow industry to experiment. There is need to train producers on quality and standards, removing sand particles. Cassava as a food should also be introduced in training curriculum at secondary and college levels and in food technology and catering training.

3.4.2.3 Cassava Demand and Consumer Behaviour and Preferences

Determining consumer preferences was done through informal and random consumer survey of individuals. Because the sample was small, findings are discussed in general terms. FAO did a detailed study of urban demand for cassava and can be referenced.

Those who did not eat or consume cassava at all (30%) mentioned that they preferred maize, that they did not like cassava meal. The 40% who consumed fresh roots and leaves ate it as snack or vegetable and cited nutrition and flavour as the main reason. Many indicated their intention to increase consumption of leaves and fresh roots in future because it is cheap. The 20% that ate cassava flour as nshima did so occasionally and normally mixed cassava meal with maize meal to improve texture and flavour. These are normally middle-aged though members of households also joined in and have come to like the mixture. In reflecting on this, the FAO urban consumer study concluded as follows:

1. Availability of cassava was more constraining in low density residential areas (42% compared to about 20% in medium and high density residential areas).
2. Lack of interest in cassava was more for households with non-cassava consuming origins (63.2% compared to 41.3% for households from cassava consuming origins).

3. Inadequate knowledge more for households with non-cassava consuming origins (38.2% compared to 24.5% for households from cassava consuming origins).
4. High cost of cassava was common to both households with cassava consuming and non consuming origins.

The consumer assessment showed that cassava flour is consumed regularly at lunch and dinner in Lusaka as a vegetable, snack and nshima. But one of the reasons for low levels of consumption is limited range of final end products and food presentations, unlike in other parts of the world.

Box 1. Estimating Demand for Flour in Lusaka

Just a note on potential urban demand for cassava flour; If, as previous consumer surveys have shown, 20% of urban consumers in Lusaka (population 3.5 million) consumed cassava at 5kg per month, then potential demand is estimated as 42,500mt per year. This translates into 168,000mt of raw cassava per year. If the cassava commercialisation campaign managed to raise consumption to 40% of urban dwellers, then demand is 85,000mt or 336,000mt of raw cassava. This is 8-10% of the current national production for Lusaka alone.

3.4.2.4 Cassava Stock Feed Processing and Retailing

Domestic use of cassava as an animal feed is the least developed of domestic markets. But the decline in maize production and increasing imports of the same poses some opportunities for increased uptake of cassava as a partial substitute. It is technically possible to replace much of the maize by cassava in animal stock feeds.

The millers and stock feed manufacturers interviewed on this matter presented the following collective views: The main constraints and foreseen in adopting cassava and integrating it into the stock feed are lack of know-how, technology and machinery for processing, lack of constant supply of the raw materials and lack of market for the product. Their current stock feed ration formulae do not include cassava and they have no knowledge of any cassava-based formulae. It is not easily digestible and does not produce the right type of chips used for stock feed manufacture. It has no fiber meal content.

The millers recommended that Government and other promoters should educate and work with the millers on relevant formulae and was to integrate cassava in stock feed. Intensive adverts to inform consumers about possibilities and impact of cassava based stock feeds on growth rate of livestock is required.

3.4.3 International Trade in Cassava

Zambia has no significant imports of cassava except that informally traded across borders that remains poorly monitored and documented. The flow of cassava across borders depends very much on the food supply situation in the partner countries. The Democratic Republic of Congo, Angola and Tanzania are the main informal trading partners for cassava products. FEWSNET has been running a monitoring system for informal cross border trade but no significant trade statistics on cassava have been discerned. The Kasumbalesa Border Post in Chililabombwe is the main destination and transit point for cassava chips from Luapula, Copperbelt and North-Western Provinces.

The anticipated introduction of the Southern African Development Community (SADC) Free Trade Area, within the framework of the SADC Trade Protocol, is a great opportunity to formalise and increase cross-border trade in cassava products, bringing 15 countries into a Free Trade Block. A tariff phase-down has already been commenced in January 2008. This measure forms part of the key steps to economic integration leading to a Customs Union in 2010, Common Market in 2015 and a Monetary Union by 2018. It provides that up to 85% of listed products shall trade at zero tariff and the remaining sensitive products covered by 2012. A key operational condition is that traders shall produce a Certificate of Origin at border points to guarantee that the goods originate from within SADC. It is not clear whether cassava and its by-products are included in this list or schedule as a search on the SADC website could not reveal the schedule of qualifying goods. The potential for industrial application of cassava would be greatest in a bigger market, especially South Africa. The Democratic Republic of Congo, Angola and Tanzania offer much potential as trading partners for cassava products for human consumption.

3.5 Roles and Constraints of Supportive Institutions

3.5.1 Government Roles and Practices

Section 1.6 reviewed policy background and how it affects cassava development and commercialization. In this section, we review the current and potential roles and practices of Government public sector institutions in promoting cassava.

3.5.1.1 Influence of Policies in Cassava Commercialisation Trends

Zambia has developed a Fifth National Development Plan (FNDP, 2006-2011) under which achievement of sustained agricultural enterprise diversification is a key objective as also reflected in the National Agriculture Policy. As part of its support to this stated aspiration, FAO is supporting MACO in translating the diversification objective into reality by introducing cassava promotion. The Italian Government has provided funds through a Trust Fund and this study was commissioned to discern the indicative patterns

and trends in domestic and industrial consumption of cassava as a basis for designing a promotional strategy.

Many studies have shown that poverty is widespread and well entrenched in Zambia and is considerably higher in rural than in urban areas. Improvements in the livelihoods of smallholder farmers have been uneven due to lack of profitable marketing opportunities for their surplus produce, and farmer's inability to develop marketing practices to take advantage of the opportunities for diversified and value-added production.

In the late 1980s to mid-1990s, Zambia implemented Structural Adjustment Programmes (SAPs) to restructure public sector services and liberalise support services. Private firms were expected to expand their investments in research and extension, input supply, product assembly, processing and export. This market liberalization has affected most smallholder farmers who depended on access to high cost inputs and output markets to produce maize. This pattern has been worsened by frequent droughts in the traditional maize growing areas of Zambia.

The combined affect of these trends has been a significant shift in the cropping patterns amongst smallholder farmers, with the predominant trend being a shift away from maize towards alternative food staples. Smallholder farmers have been diversifying into less risky, low cost and drought tolerant food crops such as cassava, sweet potato, sorghum and millet. As seen above, there have been significant increases in the area planted under root and tuber crops.

Four major policy instruments have guided development of the agriculture sector since 2000. The Poverty Reduction Strategy Paper (PRSP) targeted reducing poverty by 50% by the end of 2004. The Agriculture Commercialization Programme (ACP) as the main agricultural component of the PRSP underscored the need to promote a competitive private sector-driven agricultural marketing, trade and agri-business system to develop agriculture in Zambia. The National Agriculture and Cooperatives Policy was expected to remove uncertainties related to the recent re-introduction of subsidies on agro-inputs and price supports, mainly for maize. All these policy instruments therefore seem to favour the growth in non-maize crop enterprises like cassava by removing or minimising the impact of the constraints listed in Section 1.5 above. Through the Root and Tuber Crops Improvement Programme Government has provided technical support to improve varieties that are officially released and provided to raise yield to over 20 ton/ha. In addition, production packages are available for training farmers on improved management practices. Mansa Technology Assessment Site is one of the public research stations catering for cassava research. These materials need to be distributed and popularised to raise yields.

It is on the marketing and agribusiness side of the coin that Government agencies need to do much more to support cassava commercialisation. Mobilisation and training of producers and traders in agribusiness skills is required. Provision of production and market information to both groups is also required. Provision of market and processing

infrastructure is urgently required. Key partners in this are the DACO's office, especially the Marketing and Agri-Business Department and the Cooperatives Department.

Trends in cassava commercialisation have been negated by macro-economic policies and practices as well as trends. The cassava chains are affected in many ways by prevailing policies. The heavy subsidies on maize inputs and marketing have tended to force farmers to sideline cassava in favour of maize. The fiscal policies and monetary allocations to the agriculture sector have been targeted at maize. On the other hand, the rising inflation and cost of the food basket has encouraged many consumers to think of alternatives to maize meal and cassava benefited.

An important player in cassava promotion and commercialisation is the Zambia Development Agency (ZDA) under the Ministry of Trade, Commerce and Industry (MTCI). The ZDA is an amalgamation of the former Export Board of Zambia, Export Processing Zones Authority, Small Enterprises Development Board, Investment Centre and Zambia Privatisation Agency. ZDA will be a one stop shop for private sector development activities and high priority is given to agricultural exports and several value chain analyses have been conducted. In Zambia's strategy for export diversification new products with export potential have been identified. Value chain analysis has been carried out for honey, livestock, horticulture and apparel. Support for these sectors includes import duty drawback schemes and incentives for investment.

However, the current trade policy provides only general guidelines with no specific reference to the development of specific commodities with potential for industrialisation and export. ZDA provides incentives for domestic and foreign enterprises in the priority sectors if their investment is above \$500 000. The priority sectors focus on high value added activities especially in processing of agricultural raw materials and minerals. In 2007, new investment has been concentrated in agro-processing, copper products, processing of gemstones and tourism. And cassava is not one of the targeted commodities. In 2008 the Citizens Economic Empowerment (CEE) programme will finally be operational. The seed money of 70 billion kwacha will be provided as loans and will be leveraged through cooperation with financial institutions.

Discussions with the Acting Director of Investments Promotion and Privatisation revealed that there is no specific promotion investment strategy targeted at cassava. But he emphasised that investment promotion is required at producer and market levels of the value chains. On whether cassava and maize should be promoted to the same extent, he mentioned that cost considerations and preferences should come into play. ZDA advocated a basic approach starting with awareness creation among consumers highlighting the benefits of cassava. Existing policies, plans, laws and regulations are sound enough to facilitate cassava promotion.

3.5.2 Civil Society and Non-Governmental Organisations

3.5.2.1 Agriculture Consultative Forum (ACF)

The Agriculture Consultative Forum (ACF) is a registered non-governmental organisation whose mission is to promote in a non-partisan manner, evidence based private-public sector dialogue, consultation and participation in the development, implementation, monitoring and evaluation of agricultural sector policies and programmes. With a broad membership drawn from public, private, CSO and donor organisation, and in line with the above mandate, the ACF forms a perfect forum for hosting the *Acceleration of Cassava Utilisation Task Force (ACU)*, a successful model for the development of cassava value chains. This is a sub-forum of cassava enthusiasts that, baffled by the low level of appreciation of cassava among the business community, decided to transform themselves into a Taskforce to raise the profile of cassava through generation and provision of information.

Established in 2005, they soon produced a baseline report entitled, “*Cassava Promotion in Zambia*” that identified constraints and provided recommendations on way forward, identifying three main intervention areas under which they operationally re-organised themselves as Working Groups:

- Trading standards
- Animal feed industry
- Human food and allied industries

The Working Groups have made much progress as outlined below:

1. Collected and sent samples of cassava for cyanide content to two laboratories in RSA, results that formed the basis for Zambia Bureau of Standards (ZABS) to advise on minimum trading standards for flour and chips to be implemented soon.
2. They commissioned trials on cassava-based livestock feeds focussing on poultry, dairy and pigs. Stock feed companies showed a lot of interest and on the basis of these trials, Tiger Animal Feeds started buying cassava from smallholders to incorporate into fed formulations. Some farmers volunteered to continue on-farm testing of the cassava based feeds.
3. They conducted tasting trials for Nshima and fritters using composite flour in partnerships with Harriet’s Bakery and Restaurant, as part of exhibits at the National Agriculture and Commercial Show in 2006. Adoption of composite flour by millers has however, been slow. They convinced the Hotel and Catering Association of Zambia to intensify promotion of composite flours.

The ACU is continuing to decentralise its work to districts and has facilitated the established *District-level Cassava Taskforces*. These should be the main channels for project and other promotion work.

3.5.2.2 Programme Against Malnutrition (PAM)

PAM is one of the biggest national NGOs involved in agricultural rehabilitation and food security. Their recent interventions in Zambia are best known through the Food Security Pack (FSP) sponsored by government for vulnerable but viable farmers. PAM is very visible in the project area for many projects it is carrying out. Seed multiplication, production, processing and marketing for cassava is being promoted by PAM. PAM has also demonstrated capacity for food processing support at household level. They have published a booklet on “*Delicious Recipes from my Kitchen*”, with cassava based recipes included. PAM has also been identified to manage the Mansa Cassava Milling Plant by WFP. PAM is also the main contractor for mobilizing farmers for the FAO cassava project.

These roles make PAM a critical stakeholder central to coordinating cassava promotion. PAM believes cassava deserves more promotional support than even maize. Emphasis on development of IEC materials is required. More attention should be paid to post-harvest processes. But collaboration among stakeholders is important and Government should provide more support to ACU. Policy reforms to de-emphasize maize are required for cassava promotion to succeed, coupled with tax incentives to cassava processing industry. PAM advocates improved input delivery schemes for cassava and on-farm processing. Cassava should become an important food at farm level. The media should play a role to popularize cassava as a cash crop.

The main constraints to promoting cassava are budget and staff constraints that reduce the coverage of potential beneficiaries as well as poor processing facilities at farm level. Specialized expertise is required for agronomist, food processing specialist, economist and sociologist.

3.5.2.3 Plan International

Plan International promotes cassava in Mansa district through agronomic training, and in processing and drying. Market advisor services are also provided to farmers in Area Development Project area. Plan has worked with farmer groups and associations, processors, traders and agribusiness organizations.

3. 5.2.4 Zambia National Farmers Union (ZNFU) District Farmer Associations (DFAs)

The District Farmer Associations in Mansa is well established and active. DFAs are mandated to train and provide market information to members and the farming community. Notably, an SMS based market information sharing system has recently been launched and lobbying to ensure cassava is included as one of the commodities to be covered is required. They should work closely with cassava buyers for organizing cassava marketing and information dissemination on cassava supplies. More information should filter through to the Farmer Magazine which so far has not covered it well. Consideration to lobby for the formation of a Cassava Commodity Committee should be made.

3. 5.3 Donors and Development Partners: Financing Facilities

There are many donor organisations and projects that can play a critical role in cassava promotion. The Japanese International Cooperation Agency (JICA) actively promotes cassava and covers Luapula and other provinces, focussing on both production and processing. Through FODIS/JICA, seed multiplication, capacity building for extension and processing is being promoted. JICA operates on the premise that cassava can be a companion crop for maize for improved food security and not a replacement. Cassava requires less fertilizer. JICA feels the policy is conducive for the promotion of cassava, but more diversification incentives may be required.

FAO has several initiatives on cassava promotion. It has promoted cassava as a food security crop through its emergency programmes in Eastern, Western and Southern Provinces. FAO has also sanctioned this study as part of its GTFS/RAF/364/ITA project. FAO is focusing on value chains development and post-harvest processes. Outside project support, FAO has a vast array of technical assistance skills and expertise that can be used to backstop agri-business entities wishing to be engaged in cassava processing and trade.

The other UN agency with interest in cassava development is World Food Programme (WFP) that is working with PAM to establish a Cassava Milling Plant in Mansa with a monthly capacity of 10,000m of flour. WFP also intends to fortify cassava flour in an effort to improve its nutritional qualities. The target group is refugees a Mwange but Zambian consumers will also benefit.

The Finnish International Development Agency (FINNIDA) has a Programme for Livelihood Improvement and Development Project in Luapula that is also Targeting cassava development. PLARD resources will also support the development of cassava value chains in Luapula province.

The World Bank funded Agriculture Development Support Project (ADSP) has two financing facilities that could be utilised by cassava stakeholders: the Supply Chain Credit Facility (SCCF) and the Market Improvement and Innovation Facility (MIIF). Managed through Bank of Zambia, the SCCF is a \$12m loan facility that can be used to set up or improve/adapt current processing facilities. The MIIF on the other hand is a \$3.7m matching grant facility that can be used for innovative research and product development such as developing and testing new products.

The International Fund for Agriculture Development (IFAD) will soon launch a Rural Finance Credit Facility to develop industries and enterprises in rural areas.

3. 5.4 Private Sector

3. 5.4.1 Zambia Association of Chambers of Commerce and Industry (ZACCI)

There is a growing interest by private sector to consider engagement in the cassava sub-sector. According to the Policy Officer interviewed, ZACCI promotes agricultural development indirectly through ZNFU. ZACCI is of the view that maize should not be wholesomely promoted even in areas where cassava grows better. Greater awareness and media campaigns are required to promote cassava benefits are required. ZACCI advocates for more incentives for farmers improved marketing institutions and processing incentives and more media campaigns.

3. 5.4.2 Zambia Chamber of Small and Medium Scale Business Associations (ZCSMBA)

ZCSMBA is an upcoming private sector organisation for medium and small scale businesses, most of which would cover cassava industry stakeholders through District Business Associations (DBAs). It is an agribusiness coordination agency. It has cassava as one of the target crops for commercial development focusing on market development alongside other crops. Cassava is recognized to have great potential. This potential can be realized by supplying plantlets for improved varieties supporting value adding processes. They feel the existing laws, policies and incentive structure are not explicit enough on cassava and so are less supportive. ZCSMBA has the necessary network and country-wide structure to facilitate cassava promotion. There is need for improved statistics as a basis for market information required to effectively link producers to industry through traders.

The main constraints are lack of transport for membership mobilization, lack of seed funds for start up operations; weak capacity of executive members especially in skills related to business management, membership management and mobilization strategies. The DBA is also concerned with mushrooming business organizations, all possibly duplicating each other's mandates.

3. 5.4.3 District Cooperative Unions and Primary Cooperative Societies

The cooperative movement, once a vibrant agri-business institution nationwide, is going through some of their hardest and harshest periods. Perhaps it is a measure of their tenacity that both the national level Zambia Cooperative Federation and the Provincial and District level cooperatives unions are still alive though with difficulties. There are some Primary Cooperative Societies (PCS) at community level. The Ministry of Agriculture has been actively promoting and encouraging farmers to join these. But many are unable to operate any meaningful business due to low business skills among members, government interference and subsidies and lack of committed membership.

But if their capacity was improved, DCUs through primary cooperative societies could be powerful channels for organising business in processing of cassava. A significant proportion of society members are cassava farmers. Either some PCSs or DCUs can acquire and manage cassava milling plants capable of producing graded high quality flour for use by the consumer industry. Funds to support tthese initiatives such as he ADSP Market Improvementt and Innovation Facilityty (MIIF) can be used. FAO can build their capacity to meet conditions to access the fund and provide ttechnical backstopping.

4.0 ANALYSIS OF CONSTRAINTS AND SOLUTIONS

4.1 CONSTRAINTS IN THE CASSAVA VALUE CHAINS

A number of factors must exist that render the cassava enterprise viable and successful. The main factors are related to the consumer and market demands, and to the technology available to producers and processors to determine supply response to consumer demand. In the case of cassava in Zambia, critical success factors include the emerging market cassava in Zambia that is increasing though slowly.

An analysis of key constraints for the slow expansion of cassava is made in Figure 7 and Tables 12, 13 and 14. The low levels of consumption at rural household, urban and industrial levels, and the lack of diversification of end products as well as the inability of Zambian farmers and traders to exploit regional markets is a major hindrance to expanded production. The absence of finance and credit for traders, low levels of skills in marketing, especially quality control, standards and packaging also constraints cassava expansion.

Analysis of the cassava market in Zambia in terms of strengths, weakness, opportunities and threats is made and summarised in Figure 7 and Tables 12, 13 and 14. A closer analysis of all these constraints and challenges in the development and commercialisation of cassava reveals a clear and global pattern established earlier that the weakest link in the cassava value chains development is lack of information by industry and biased attitude towards cassava as a consumable or industrial product. This is compounded by low consumer interest and appreciation of cassava as a consumable product of value. The low capacity for media coverage and the lukewarm treatment of cassava by policy makers is a fundamental cause of this low commercial profile.

The implication of this analysis is that through farmers know the basic production practices and using current technology, produce existing levels of output, any further expansion in production and investment in productivity-enhancing technology will be incumbent on availability of expanded market and commercial opportunities. Farmers may not invest in improved management and increase yield because they are selling only less than 30 percent that the market can absorb. Based on this analysis, this study will

conclude that a prioritized list of interventions will be built around resolving constraints related to consumption, industrial processing, retailing and marketing.

1. Low demand for cassava products.
2. Low potential for post-harvest value adding.
3. Low productivity and profitability to farmers.
4. Weak policy and institutional Support.

The cassava sub-sector, described as thus, indeed has some short-term challenges, but possesses tremendous future potential (SWOT Analysis in Table 12). The main strengths inherent within the sector include the fact that cassava is a well established crop in 50 percent of Zambia’s geographical expanse. The current national output is wholly based on indigenous technology with little influence from formal research and extension systems. Zambia has vast expanses of land, water and fertile soils to expand area under cassava. The research systems have developed new high yielding varieties that still remain lying on the shelf ready for any opportunity to adopt them. Therein lies the potential for productivity increases. Another area of strength is that the trendy urban elites and consumers are now realising the importance of traditional foods and demand for cassava has been rising of late. The taste of cassava products is well known by most middle-aged population segments. The interest of the private sector in cassava trading is rising as seen by roadside bags being ferried to urban areas and to neighbouring countries. New interest in cassava processing and bagging has also been noticed with numerous brands being stocked in upmarket stores and grocers.

Table 12: SWOT Analysis for the Cassava Sub-Sector and Value Chain

<p><u>Strengths</u></p> <ul style="list-style-type: none"> • Experience by farmers and traders • Rising cassava demand • Plenty of land, water and fertile soils • Taste of cassava known • Low input crop • New high yielding varieties available • Private sector involvement rising • Processing capacity expanding 	<p><u>Weaknesses</u></p> <ul style="list-style-type: none"> • Limited access to regional and international markets • Limited financial resources • Lack of grading and standards • High cost of transportation • Maize dominance
<p><u>Opportunities</u></p> <ul style="list-style-type: none"> • Government and donor support • Traditional support • Infrastructure development • Communication for trade • Flourishing support institutions 	<p><u>Threats</u></p> <ul style="list-style-type: none"> • Subsidies to maize • High cost of processing facilities • High energy cost (fuel and electricity) • Crop disease/pests; • Lack of capital investment funds • High transport costs; • High marketing cost

This means that as long as the inherent weaknesses in the cassava sub-sector can be addressed, including overcoming export barriers, inducing industrial processing, providing financing opportunities for product development and production, overcoming the negative image through grades and standard and diminishing the maize predominant culture and bias in Zambia, Zambia could become a major cassava producer, consumer and exporter and contribute to its achievement of middle-income country status by 2030.

This is especially so because there are tremendous external opportunities that raise cause for optimism. Government, NGO, private sector and donor attention to diversification is increasing and cassava lies in wait as one of the potential commodities to contribute to food security for smallholder farmers. Traditional authorities have realised the folly of dropping cassava and relying on maize as climate change effects take their toll on the farms. There is a rising interest as infrastructure development advances to process cassava and integrate into food, feed and industrial products. Communication and trade policies are improving and the flow of information is improving with better communication facilities. Government has designated cassava as one of the crops to be officially procured through the Food Reserve Agency and its production statistics are now collected, though belatedly. There existing a flourishing level of support from non-governmental state actors as well as donors in support of cassava.

The main threats and challenges towards sustaining this expansion remain the prevailing emphasis on maize and its subsidies. High cost of processing facilities, energy and transportation of bulk supplies remains a threat. Cassava is still prone to mealy bug and mosaic virus attacks in many areas.

Figure 7: Constraints in the Cassava Value Chain

LINK	DESCRIPTION	CONSTRAINT
Production	<ul style="list-style-type: none"> Based on traditional improved technology Cassava planting in January-March Low tuber yield 	<ul style="list-style-type: none"> Labour constraints Low use of improved varieties Late planting Cost of labour is high Weak extension
On-Farm Processing	<ul style="list-style-type: none"> Processing using pestle and mortar Poor standard product with impurities Over 70% consumed a farm level 	<ul style="list-style-type: none"> Lack of improved processing technology Lack of guidelines on standards Low flour yield and poor quality Lack of suitable mills
Transport Trading/ Marketing	<ul style="list-style-type: none"> Products ferried o roadside Distant and scattered production areas Local traders are main buyers in local markets. No significant institutional buyers Buyers hire transport to take crop to market 	<ul style="list-style-type: none"> Lack of storage facilities Expensive transportation Poor roads Limited capacity of buyers Suspicion of traders as exploiters Lack of capital Lack of market information
Industrial Processing (3 chains)	<ul style="list-style-type: none"> Dominant is milling for flour Integration in stock feeds still experimental Integration into baking and confectionery still pilot 	<ul style="list-style-type: none"> Plant machinery not adapted to cassava Ration and formulae no tested for cassava Industry not trained on cassava integration Industr not sure how consumers would react and effect of cassava on performance Lack of capital
Retailing and Consumers (3 chains)	<ul style="list-style-type: none"> Cassava flour being stocked in major supermarkets and at public markets Over 20% of urban consumers eating cassava Some restaurants and hotels testing cassava meals Some bakers testing cassava Very little stock feeds have cassava in them 	<ul style="list-style-type: none"> Consumers not sure about nutritional effects of cassava Low media coverage Low nutritional policy support

Table 13: Analysis of Cassava Value Chain Participants and Performance

VALUE CHAIN STAGE	KEY PLAYERS	ROLES	PERFORMANCE (VALUE ADDED)	NEEDS AND CONSTRAINTS (Weak links)	INTERVENTIONS (Based on Stakeholder input)
A. PRODUCTION					
	Smallholder farmers	Produce, process, trade sale	Cassava production increasing Yield = 10m/ha = 33% of research and 50% of world average Return to capital 29% (25-35%)	Labour constraints Low use of improved varieties Late planting Cost of labour is high Weak extension	Improved varieties Early planting Good management Labour saving implements Motivated and equipped extension
B. TRANSPORTATION & TRADING					
	Private traders	Buy, transport, process & sell	Private traders handle 60% of traded cassava Private traders get 96% return (27-215%). Private traders get 46% on local markets. Capital is 39% of marketing costs Transport is 24% of marketing costs Processing is 25% of marketing costs	Producers not well organised Lack of assembly points Bad roads Financing Lack of trust among players Low marketing skills Weak market information	Extend SMS market information to rural areas Sensitise farmers to form groups Develop capacity for Patenting, Branding and Quality assurance Facilitate formation of an association for Traders Link to capital loans and credit
	Producers	Transport, process & sell	Farmers trading get 46% return Transport is 24% of marketing costs Processing is 25% of marketing costs		
	FRA	Buy, store and sale	FRA handles very little proportion of traded volumes Facing difficulties disposing of supplies on market		
C. ON-FARM PROCESSING					
	Producers	Buy, process, sell	Processing is 25% of marketing costs	Seasonal supplies High energy cost Fluctuation in voltage High diesel cost Lack of sorting/grading capacity Maintenance skills	Train milling operators, employ qualified staff Lobby Energy Regulation Board for reduced energy cost Install grading and sorting cylinders on mills Improve business skills for processors
	Small Millers	Process			
D. INDUSTRIAL PROCESSING					
	Millers	Stocking, process,	Increase in millers branding cassava	Plant machinery not adapted	Improve business skills

		bulk sell, product development	meal Increased interest in cassava by-products Increased attention and interest to use cassava in stock feeds	to cassava Ration and formulae not tested for cassava Industry not trained on cassava integration Industry not sure how consumers would react and effect of cassava on performance Lack of capital	for processors Improved support to product development research Improved capital loans Training of industry support Awareness creation
	Bakers	Stocking, process, bulk sell, product development			
	Stock feed manufacturers	Stocking, process, retailing, product development			
E. RETAILING & CONSUMPTION					
	Farm households in cassava and non-cassava areas		Retailers margins not computed due to lack of data Annual flour demand 42,500mt per year in Lusaka alone. Retail cassava K3,000 - K5000 per kg Cassava flour stocking increasing in up-market shops and public markets	Low diversity of cassava end products Poor presentation and information Low marketing skills Consumers not sure about nutritional effects of cassava Low media coverage Low nutritional policy support	More media campaigns on benefits of cassava Improved policies on cassava promotion Improved quality and standards
	Urban consumers				
	Restaurants				
	Institutional consumers				

Table 14: Assessment of Capacity of Supportive and Regulatory Institutions

KEY PLAYERS	ROLES	NEEDS AND CONSTRAINTS	INTERVENTIONS
Public Institutions			
Central Government MACO District authorities Traditional and Local Authorities	Macro policies Trade Laws and policies Investment incentives FNDP implementation Infrastructure Energy cost Sub-sector policies and plans Marketing policies Bye-laws and regulations Levies and taxes	Lack of explicit investment incentives for cassava industry Lack of commodity focus Focus on farmers not traders and processors Weak information and statistical base Biased policies Weak resources and information	Intensify distribution of improved varieties Propagate improved management Develop an agribusiness extension package for cassava, including sources of financing, grants and loans Provide farmers and traders with business skills Provide feeder roads and marketing infrastructure
Supporting Services			
DBAs, DCUs, DFAs Private Sector and NGOs:	Trader mobilisation and support Mobilising investment capital Building business skills Inputs and implement supply Credit mobilisation and management Brokering trade Extension & Research services	Weak business skills Farmer mobilisation weak Weak resources Lack of financing	Link farmers to input and implements suppliers Build capacity of farmer and traders groups and associations Broker knowledge and new ideas Facilitate branding, Quality Assurance and Advertising for cassava Link farmers to finance and outgrower schemes Improved processing Bulk marketing
Cooperating Partners World Bank, FINNIDA, JICA, FAO, WFP, IFAD	Matching grants and loans Infrastructure Training	Competition and duplication of efforts by stakeholders Low uptake of loan facilities	Facilitate flow of information on available funds

4.2 RECOMMENDATIONS TO IMPROVE CASSAVA VALUE CHAINS

Based on the summary of key constraints and challenges discussed above and outlined as (i) Low demand for cassava products; (ii) Low potential for post-harvest value adding; (iii) Low productivity and profitability to farmers and (iv) Weak policy and institutional Support;, a discussion of potential solutions is discussed below. Taking cognisance of all potential partners and players in the cassava value chains, commercial partnerships based on chain connections through formal and loose arrangements should be forged for the mutual benefit of all involved. The specific interventions are described below revolving around four prioritised intervention areas and summarised in Table 15 in terms of their justification, priority, timeframe, possible financing and responsibility for action.

1. Market Development: Stimulating higher demand for cassava products.
2. Process and Product Development: Adding post-harvest value.
3. Improved Production Systems: Increasing efficiency and profitability for farmers.
4. Institutional Support.

4.2.1.1 Intervention Priority One: Market Development and Demand Stimulation

- Conduct media campaigns on benefits of cassava as a commercial product.
- Conduct consumer-wide surveys on different cassava chains products.
- Highlight diversity of the end use products of cassava at world level.
- Link traders and retailers to restaurants, hotels, schools and health institutions
- Support cross border trade through training and market research.
- Extend SMS market information system to cassava.
- Improve patenting, branding and quality assurance for on-shelf products.
- Facilitate formation of an association for traders, processors and retailers.
- Link chain players to sources of capital loans and operational credit.
- Support establishment of assembly points and market centres.

4.2.1.2 Intervention Priority Two: Process and Product Development

- Improve technical and business skills for processors.
- Support and provide grants to new product development and research.
- Improve access to capital loans for processors.
- Provide technical training for staff in cassava industry.
- Provide information on the variety and feasibility to use cassava as raw material.
- Improve business skills for processors.

4.2.1.3 Intervention Priority Three: Improved Production Systems

- Provide planting materials for improved cassava varieties desired by industry.
- Promote early planting of cassava.
- Produce extension packages and promote good management practices.
- Introduce labour saving implements.
- Train extension staff in cassava management.

4.2.1.4 Priority Intervention Four: Institutional Support and Cross Cutting Principles

- Provide coordination forum through the ACU to build a culture of mutual trust and cooperative spirit among chain players through regular meetings and consultations.
- Lobby for tax incentives for industries that integrate cassava as raw material.
- Lobby for the declaration of cassava as a national supplementary staple
- Facilitate group formation for producers and legalised trader networks
- Promote outgrower schemes for cassava.
- Organise Buyer-Producer matching fora and events;
- Reduce or avoid direct subsidies to the cassava chains or competing product chains.

Table 15: Prioritised Recommendations to Improve Cassava Value Chains

Action	Justification (see Table 12, 13 and 14)	Priority Weight ¹ (1,2,3)	Stakeholders Responsible	Potential Source of Funds	Timeframe ² (s,m,l)
Intervention Priority One: Market Development and Demand Stimulation	Weakest link in the chain based on lack of information and biased attitude towards cassava as a consumable or industrial product. Lack of assembly points, bad roads, lack of financing, lack of trust among players, low marketing skills, weak market information, lack of consumer interest and low media coverage	1			
• Conduct media campaigns on benefits of cassava as a commercial product.		1	MACO-FAO-ACU	FAO, JICA, WFP	S
• Conduct consumer-wide surveys on different cassava chains products.		1	MACO-ACU	FAO, JICA	M
• Highlight diversity of the end use products of cassava at world level.		1	FAO-ACU	FAO	M
• Link traders and retailers to restaurants, hotels, schools and health institutions		1	ACU	FAO	S
• Support cross border trade through training and market research.		1	MACO-ACU	FAO, WFP	M
• Extend SMS market information system to cassava.		1	MACO-ACU-ZNFU	FAO	S
• Improve patenting, branding and quality assurance for on-shelf products.		1	ACU-ZBS-PACRO		S
• Facilitate formation of an association for traders, processors and retailers.		2	ACU	FAO	S
• Link chain players to sources of capital loans and operational credit.		2	MACO-ACU	FAO	S,M
• Support establishment of assembly points and market centres	2	MACO	MACO-FAO	S,M	
Intervention Priority Two: Process and Product Development	Low diversity of products, lack of skills and capital, plant machinery not adapted to cassava, lack of consumer understanding, seasonality of supplies, high energy cost, low grading capacity				
• Improve technical and business skills for processors.		2	MACO-FAO	FAO	M
• Support and provide grants to new product development and research.		1	MACO	Donors, Banks	S,M
• Improve access to capital loans for processors.		1	MACO	Donors, banks	S,M
• Provide technical training for staff in cassava industry.		1	MACO-ACU	FAO	S
• Provide information on the variety and feasibility to use cassava as raw material.		1	MACO-ACU	FAO	S
• Improve business skills for processors.	2	MACO-ACU	Donors	M	

Intervention Priority Three: Improved Production Systems	Farmers know production but: labour constraints, dominance of local varieties, low yield, late planting, Crop disease & pests, inappropriate varieties				
• Provide planting materials for improved cassava varieties desired by industry.		1	MACO-ZARI-PAM	FAO, JICA	M
• Promote early planting of cassava.		2	MACO	MACO	S
• Produce extension packages and promote good management practices.		2	MACO-FAO	FAO	S
• Introduce labour saving implements.		2	Private sector	Banks	M
• Train extension staff in cassava management.		2	MACO-FAO	FAO	S
Priority Intervention Four: Institutional Support and Cross Cutting Principles	No incentives for cassava industry Bias against traders and processors, weak information base, biased policies, weak resources, weak business skills, players not organised, duplication of efforts by stakeholders				
• Provide coordination forum through the ACU.		1	ACF-ACU	Donors	S
• Lobby for tax incentives for industries that integrate cassava as raw material.		1	ACF-ACU	Government	S
• Lobby for the declaration of cassava as a national supplementary staple		1	ACF-ACU	Government	M
• Facilitate group formation for producers and legalised trader networks		2	ACU	FAO	S
• Promote outgrower schemes for cassava.		2	MACO	GRZ-Donors	M
• Organise Buyer-Producer matching fora and events;		2	ACU-MACO	Donors	M
• Reduce or avoid direct subsidies to the cassava chains or competing product chains.		2	MACO	-	m

2. where 1=high, 2=medium and 3=low: 2. where s=short-term, m=medium-term and l=long-term

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ANNEXES

Annex 1: Institutions Visited and People Met

Samfya

1. Stanford Nkhoma, District Agriculture Coordinator
2. Loveness Chola – Farmer, Kafubashi camp
3. Wilbroad Kunda – Farmer, Chundwa camp
4. Eric Kunda – Farmer, Manokola camp
5. James Kunda – Farmer, Chiundwa camp
6. John Miyambo – Trader/Farmer, Miponda camp
7. James Kaoma - Farmer, Miponda camp
8. Alias Tende - Farmer, Miponda camp
9. Justin C. Kalokoni - Farmer, Miponda camp
10. John Chibela - Trader
11. Albert Mwansa – Trader
12. Modred Sunga Kasongo – Trader
13. Justin Chola - Trader

Mansa

14. Best Banda, Principal Agriculture Supervisor
15. Plan International
16. Dainess Mgaiwa – Farmer Chikonshi camp
17. Nightson Malangisha – Farmer, Kalyongo camp
18. Chama Jecap Mwewa – Farmer, Mulonga camp
19. Chilufya Jeafray – Farmer, Chikonshi camp
20. Mofya Elizabeth – Chikonshi camp
21. Chibuye Dominic – Farmer, Kalyongo camp
22. Herman C. Muchimba – Farmer, Yorum Mwanje camp
23. Silvestor Mwewa – Trader/ Farmer, Mwewa West camp
24. Kapaso Chibwale - Farmer, Kalyongo camp
25. Kunda James - Trader

Serenje

26. John Mhango, Agriculture Assistant
27. P.C. Mpanganya – Farmer, Mulembu camp
28. Alfred Muwaya – Farmer, Chalilo camp
29. Peter Chibale – Farmer, Chalilo camp
30. Juliet Kalunga – Farmer Chibale camp
31. Malata Chanda – Farmer Chalilo camp
32. Gift Kalunga – Farmer, yoram Mwanje camp
33. Edward Bwanga - Farmer, yoram Mwanje camp
34. Matilda Chita – Farmer, Chimupati camp

Lusaka

Restaurants

35. Kalyachi Enterprise - Fast Food and Restaurant (Lumumba Road)
36. Sunshine Restaurant – City Market
37. Mag-Mas Restaurant - City Market
38. Africa Hut Take Away and Restaurant (Cha Cha Cha Road)
39. Ziyewe Restaurant (Cha Cha Cha Road)
40. Fajema Restaurant (Cha Cha Cha Road)
41. Good Times Investment Restaurant (Cha Cha Cha Road)
42. Sebenza Restaurant (Cha Cha Cha Road)
43. Silvia Catering (UNZA)
44. Restaurant and Take Away (Katondo Street)
45. Ares Restaurant (Freedom Way)

Hotels

46. Lusaka Hotel – Cairo Road
47. Protea Hotel – Cairo Road
48. Inter-Continental Hotel
49. Holiday inn
50. Taj Pamodzi Hotel

Bakers and Confectioneries

51. Food Palace
52. San Marko Bakery
53. Al-Hassan Take Away and Confectioners
54. One Way Investments
55. Harriets Bakery

Retail Outlets

56. Roberts Fish and Vegetable Shop
57. Spar Soweto

Consumers Residential Locations

58. Chilenje (2)
59. Kabulonga (3)
60. Woodlands (2)
61. Chalala (1)
62. Mtendere (1)
63. Fairview (2)

Private Urban Traders

64. Violet Mumba (City Market)
65. Doreen Mwenya (Kalundu Market)
66. Unknown (City Market)
67. Monica (City Market)
68. Ireen Chisanga (City Market)

Millers and Stockfeed Processors

69. Simba Milling
70. APG Milling
71. Sub-GO Milling
72. Stareg Agricultural Enterprise
73. National Milling (refused)

Supportive Institutions

74. Zambia Association of Chambers of Commerce and Industry (ZACCI)
75. Japanese International Cooperation Agency (JICA)
76. Silva Food Solutions
77. Programme Against Malnutrition (PAM)
78. Zambia Chamber of Small and Medium Business Associations (ZCSMBA)
79. Agricultural Consultative Forum (ACF)
80. Zambia Development Agency (ZDA)
81. Ministry of Agriculture and Cooperatives (MACO)
82. World Food Programme (WFP)

Annex II: Profile of Cassava Traders

Case Study 1 – John Milambo

John Milambo is a 42 year old trader from Samfya. He has been in the business for over 10 years. He buys direct from individual cassava farmers. He is a resident of the same area. He buys dry cassava chips only and handles 20 by 50kg bags (1000 kg) per business trip. He makes only about 2-3 trips per year. At K20, 000 per 50kg bags, he spends K400, 000 to buy the cassava. He transports this volume to the fishing islands where he raises about K50, 000 as flour from each 50 kg bag, raising K1, 000,000. In the process, he incurs K100,000 on transport, K30,000 personal fares, K105,000 processing from chips to flour and packaging, K15,000 on taxes and levies, K15,000 on security, K30,000 for loading and offloading and K50,000 on accommodation and food. This means he spends a total of K745, 000 per trip as marketing costs, giving him a net income of K255, 000 per trip or about K750, 000 per year. His return on capital or marketing margin is 34%.

His main constraints in cassava trading are high cost of packaging materials and transportation and lack of storage sheds at the selling point. He would like to see more loan facilities, better storage structures at marketing points and formation of traders associations that are currently absent. Even though he has natural bargaining skills, he has no been formally trained in business management. Traders associations would provide training, mobilise loans, source reliable transport and provide hammer mills or plants for affordable processing of chips o flour. Currently, only PAM is providing training in cassava processing.

Case Study 2 – John Chibela

John Chibela is a 62 year old trader from Samfya. He has been in the business for over 10 years. He buys direct from individual cassava farmers. He is a resident of the same area. He buys both fresh and dry cassava chips. He processes the fresh cassava into chips before selling. He handles 40 by 50kg bags (2000 kg) per business trip. He makes only about 2-3 trips per year. At K30, 000 per 50kg bags, he spends K1, 200,000 to buy the cassava. He transports this volume to the fishing islands where he raises about K60, 000 as flour from each 50 kg bag, raising K2, 400,000. In the process, he incurs K90, 000 on transport, K40, 000 personal fares, K700, 000 processing from chips to flour and packaging, K20,000 on taxes and levies and K20,000 on accommodation and food. This

means he spends a total of K2, 070,000 as marketing costs, giving him a net income of K330, 000 per trip or about K990, 000 per year. His return on capital or marketing margin is 16%.

His main constraints in cassava trading are high cost of packaging materials and transportation by boat and numerous payments. He would like to own a boat to reduce transport costs and better access to cheaper processing facilities. He has not been formally trained in business management. He would like to belong to a traders association to access training, loans and processing plants for flour. Currently, no organisation is providing support to traders.

Case Study 3 – Modred S. Kasongo

Mr. Kasongo is a 33 year old trader with 15 years experience in cassava trading. He buys direct from individual cassava farmers. He is a resident of Samfya and Mansa. He buys fresh, dry cassava chips and flour. He processes the fresh cassava and chips into flour before selling at the Mansa and Samfya public markets. He handles a flour equivalent of 3,750kg per year. He spends K1, 430,000 to buy the cassava in various forms but ultimately transformed into flour. He resells this volume of flour at the public markets where he raises about K5, 625,000. In the process, he incurs K400,000 on transport, K1,300,000 on processing, K20,000 on taxes and levies and K50,000 on security, K80,000 on loading and offloading and K100,000 on accommodation and food. This means he spends a total of 3,380,000 as marketing costs, giving him a net income of K2, 245,000 per year. His return on capital or marketing margin is 66%.

His main constraints in cassava trading are high security and transport cost, long distance to markets and lack of proper market facilities, loans and improved planting materials. Need to bring more buyers. He would like to belong to a traders association to access wider markets. Currently, no organisation is providing support to traders.

Case Study 4 – Albert Mwansa

Mr. Mwansa is a 40 year old trader with 4 years experience in cassava trading. He buys direct from individual cassava farmers. He is a resident of Samfya. He only buys chips and flour which he sells to fisher folk in the Bangweulu swamps. He handles a flour equivalent of 18,000kg per year in 12 trips. On each trip he handles about 1,500kg, spending K2,250,000 to buy the cassava flour. He resells this volume of flour at the swamps where he raises about K7,500,000. In the process, he incurs K400,000 on

transport, K14,000 on personal fare, K1,440,000 on processing, K30,000 on taxes and levies, K30,000 on loading and offloading and K70,000 on accommodation and food. This means he spends a total of K4,234,000 as marketing costs, giving him a net income of K3,266,000 per year. His return on capital or marketing margin is 77%.

His main constraints in cassava trading are high transport cost, long distance to markets and lack of capital. He practices grading and standards. He would like to belong to a traders association to access wider markets. He would like to be trained in cassava entrepreneurship. Currently, no organisation is providing support to traders.

Case Study 5 – Justin Chola

Mr. Chola is a 38 year old trader with 7 years experience in cassava trading. He buys direct from individual cassava farmers. He only buys chips and flour which he sells to fisher folk in the Bangweulu swamps. He handles a flour equivalent of 3,500kg per year in 2-3 trips. On each trip he handles about 1,000kg, spending K1,500,000 to buy the cassava flour. He resells this volume of flour at the swamps where he raises about K3,500,000. In the process, he incurs K300,000 on transport, K40,000 on personal fare, K520,000 on processing, K50,000 on taxes and levies and K100,000 on accommodation and food. This means he spends a total of K2,510,000 as marketing costs, giving him a net income of K990,000 per year. His return on capital or marketing margin is 39%.

His main constraints in cassava trading are high transport cost, long distance to markets and lack of capital. He would like to belong to a traders association to access wider markets. He would like to be trained in cassava entrepreneurship. Currently, no organisation is providing support to traders.

Case Study 6– James Kunda

James Kunda is a 38 year old trader from Mansa. He has been in the business for over 12 years. He buys direct from individual cassava farmers. He is a resident of the same area but also has family connections in D.R. Congo which is his main market. He buys dry cassava chips only and handles 15,000kg per business trip. He makes only about 2 trips per year. At K15,000 per 75kg bag, he spends K3,000,000 to buy the required cassava. He transports this volume to D.R. Congo where he raises about K150,000 per 75kg bag as dry chips, raising K30,000,000. In the process, he incurs K5,000,000 on transport, K60,000 personal fares, K400,000 packaging, K50,000 on taxes and levies, K300,000 on security, K500,000 for loading and offloading and K200,000 on accommodation and food.

This means he spends a total of K9,510,000 per trip as marketing costs, giving him a net income of K20,490,000 per trip or about K41.0 million per year. His return on capital or marketing margin is 215%. This is definitely a difficult but lucrative market.

His main constraints in cassava trading in Congo DR are bad roads that become impassable during the rain season limiting his trips to the dry season. High cost of transportation and security is a feature of the Congo market. The construction of the Cheembe Bridge and possible tarring of the Pedicle road will certainly ease difficulties and open up the market. The traders have not formed a traders association because they do not know how to form one. Traders associations would help to mobilise loans. Currently, no organisation is providing support to traders.

Case Study 7– Sylvester Mwewa

Mr. Mwewa is a 56 year old trader with over 13 years. He buys direct from individual cassava farmers and also produces his own. He buys raw and dry cassava chips. Sometimes he buys the whole cassava field and harvests himself. He sells the raw cassava at the Bangweulu swamps. He sells he chips and flour mostly in Lusaka and Copperbelt province a public markets. This case study focuses on this aspect of the trade.

He handles 7,500kg per business year. He spends K3,750,000 to procure the supplies. In Lusaka or Copperbelt, he sells the same volume at K55,000 per 50kg bag, raising K9,000,000. In the process, he incurs K375,000 on transport, K125,000 personal fares, K2,250,000 on processing, K300,000 on taxes and levies, K30,000 on security, K40,000 for loading and offloading and K200,000 on accommodation and food. This means he spends a total of K7,070,000 per trip as marketing costs, giving him a net income of K1,930,000 per year. His return on capital or marketing margin is 27%.

His main constraints in cassava trading in urban markets are low prices and high cost of transportation. The traders have not formed a traders association because they do not know how to form one. Traders associations would help to mobilise loans, establish bulking centres and improve communication of market information. Currently, only MACO and PAM are the organisation is providing support to traders.

Case Study 8 – Violet Mumba

Ms. Mumba is based at City market. She buys fresh tubers from farmers/traders at Soweto market who bring it from Rufunsa and Chipata districts. She sells to individual customers at City market as raw tubers. She likes sweet varieties. Her business cycle is one day.

She buys a 25kg bag per day at K50,000 and sells as single tubers a K1,000 each. She normally makes K90,000 from each bag. She incurs costs related to K7,000 transport, K6000 lunch and K3000 storage costs, totalling K16,000. Marketing costs total K66,000 with a margin of K24,000 or K624000 per month. Her return on capital or marketing margin is 36%. Her main problem is hostility from police and bad weather.

Case Study 9 – Doreen Mwenya

Ms. Mwenya sells cassava flour and chips at Kalundu market in Lusaka which she orders from Soweto market. She prefers Kaleleka variety which originates from Luapula province (Mansa and Kashikishi). And her business round is one week. She buys 50kg of dry chips at K50,000. She spends K3000 on packaging, K6000 on processing to flour, K42,000 on transport, K35,000 on food, K3000 on loading, K2500 on storage, for a total expenditure of K141,000 per week/load. She sells small packs of meal and roasted tubers and raises a total of K180,000 for the 50kg bag, giving her a net income of K38,500 per week or K192,000 per month. Her return on capital or marketing margin is 27%. Her main constraint in cassava trading in Urban markets is low demand in dry season when too much supplies.

Annex III: District-Based Profiling of Cassava Production

1. Profile of Serenje District

Serenje District lies on the borderline between the high rainfall agro-ecological region 3 and the medium rainfall region 2. Agro-ecological conditions in Serenje generally favour cassava growth. Extension staff estimated that there are 26 cassava interest groups with 390 members, established through the Agriculture Support Programme (ASP) facilitation. In 2007, there were an estimated 8,170 hectares under cassava of which about 6,500 hectares is mature. At 10tons/ha, this means 65,000mt could be harvested (or 16,250mt flour equivalent). MACO estimated about 23,898mt using 11.7mt/ha yield in 2007. The local extension officer estimated the average yield at 3.8tons/ha. *This discrepancy underlines the need for more formal training in the developed methodologies for yield estimation for cassava. In most cases, production figures from MACO-CSO were very different from locally provided figures.*

Serenje has been recording an increasing trend in cassava production in recent years. According to the recently compiled Farm Registers, out of 46,315 farmers in the district, 6,135 farmers (13%) grow cassava in Serenje, meaning the average plot size of 1.33 hectares. Production methods are commonly based on both pure stands and intercropping with other crops like maize, legumes and cucurbits. Except for careful selection of planting materials and hired labour. There are no other external inputs applied. Common varieties in Serenje with estimated dominance in terms of land occupancy include *Nkolonga* (40%), *Bwelela* (20%), *Bunganabutu* (10%), *Bangweulu* (10%) and others (20%). *Bangweulu* is the only officially released improved variety among these.

Cassava is processed on-farm mainly through peeling, soaking and drying of chips in the sun. MACO and SHEMA have introduced some cassava chippers in some communities. The proportion of households selling cassava is less than 30% because of low marketable surplus and poor markets. The main forms in which cassava is sold are dry chips, fresh tubers and flour. The main buyers in recent years are private traders who take it to Copperbelt and Lusaka and Tiger Animal Feeds that buys for its factory for stock feeds. Out of the estimated 43,000 by 50kg bags sold (2,150 mt or 13% of total production of 16,250mt) from the district, only 1,000 bags (2%) were meant for livestock feed.

Serenje has two commercial farmers (Zezeto and Sherriff) who grow and/or buy and use cassava to feed livestock. There are also promoters like SHEMA and ASP that have mobilised and facilitated market and agribusiness linkages for cassava. These provided training in production, processing, equipment and market links. The Lala Land Association also promotes cassava for food security.

The main constraint to expanded cassava production is that compared to other cash crops, its pecking order is lower because of poor markets, so resources are located to alternative crops before cassava. Cassava planting commonly starts in February. This explains the low average hectareage and the low yield. This calls for promotion of early planting. The rate of adoption of improved varieties is also quite low. Other constraints are distant markets and lack improved processing technology.

Capacity building requirements according to local stakeholders are required in (i) using local NGOs to promote cassava and conduct mobile training in communities; (ii) training in record keeping; (iii) Training farmers in improved crop management practices.

2. Profile of Samfya District

Samfya Districts lies in the high rainfall agro-ecological region 3. Agro-ecological conditions in Samfya are generally suitable for cassava growth. Extension staff estimated that there are 3,800 in 38 cassava producer groups. In 2007, there were an estimated 27,316 hectares under cassava of which about 22,032 hectares was mature. At 11.7tons/ha, this means 79,899mt could be harvested. The local extension officer estimated the total hectareage at 4,805ha. ***This discrepancy underlines the need for more formal training in the developed methodologies for yield estimation for cassava.***

Samfya has been recording an increasing trend in cassava production in recent years. According to the recently compiled Farm Registers, out of 11,635 farmers in the district, all grow cassava in Samfya, meaning the average plot size of 2.33 hectares. Production methods are commonly based on intercropping with other crops like maize, legumes and cucurbits. Except for careful selection of planting materials and hired labour. There are no other external inputs applied. Common varieties in Samfya with estimated dominance in terms of land occupancy include *Bangweulu* (15%), *Mweru* (5%) and other locals (80%). *Bangweulu* is the only officially released improved variety among these.

Cassava is processed on-farm mainly through peeling, soaking, fermenting and drying of chips in the sun. There are no improved processing tools like chippers and the pestle and mortar are the main traditional tools for processing. The proportion of cassava growing households selling cassava is 70% because of low marketable surplus and poor markets. The main forms in which cassava is sold are dry chips and flour, with insignificant amounts of fresh tubers. Out of total production, about 68% is consumed locally, 30% sold to private traders as flour/chips and 2% sold as animal feed. The main buyers in recent years are local fishers and residents (80%) and private traders (10%) who take it to Copperbelt and Lusaka.

Samfya has some small scale hammer millers who process cassava into flour. There are also promoters like PAM, FRA and MACO that train people in production, agribusiness linkages and preparation of cassava based diets. The capacity of these promoters is inadequate as they do not cover the whole value chain.

The main constraint to expanded cassava production is the predominant use of local unimproved varieties and the prevalence of Cassava Mealy Bug. Late planting is common but earlier than in Serenje. This calls for promotion of early planting. Other constraints are distant markets and lack improved processing technology for drying, chipping and packaging.

Capacity building requirements according to local stakeholders are required in (i) cassava processing, equipment, marketing and extension skills. Micro-finance for processing equipment and inputs is required.

3. Profile of Mansa District

The type of climate prevailing in Mansa District is that of the tropical continental. July is the coolest month when the average minimum temperature is 7 degrees Celsius and the average maximum is 25 degrees Celsius; the lowest temperature on record is just under 0 degrees Celsius. The hot season begins sometime in September and ends with the onset of the rains in November, temperatures usually falling to comfortable levels at night during this period. Temperatures during the rainy season range from 27 degrees Celsius in early afternoon to 15 degrees Celsius at night.

In normal situations, with this type of climate, rain begins in mid November while the climax of the rainy season occurs in January and February. Very little or no rain is experienced in April as it marks the end of the rainy season. Mean annual rainfall is just less than 1060 mm, 92% of which falls between November and March. Generally, rainfall is quite reliable. Only once in ten years is it likely to be below 880 mm that is only about 180 mm below the average.

The maximum average amount of sunshine is recorded in July, and is estimated at approximately 9.6 hours. During the rainy season the amount of sunshine is reduced considerably, never however falling below four hours a day. This negatively affects cassava processing.

Mansa is a rural district and most of the livelihood activities revolve around agriculture as the back-bone of the district economy. Many people are involved in the growing of maize, groundnuts, cassava, millet, sorghum and paprika. The vast majority of the farmers in Mansa District are smallholders. There are approximately 35,000 farming households in the district and most of these use hand hoe to cultivate land. The smallholder farmers normally cultivate up to 3 limas constituting maize, cassava, beans and groundnuts and are scattered in all the seven blocks of the district.

Mansa has been recording an increasing trend in cassava production in recent years. According to the recently compiled Farm Registers, out of 35,000 farmers in the district, all grow cassava, with average plot size of 2.00 hectares. Production methods are

commonly based on intercropping with other crops like maize, legumes and cucurbits. Except for careful selection of planting materials and hired labour. There are no other external inputs applied. Common varieties are *Bangweulu*, *Mweru* and other locals.

Cassava is processed on-farm mainly through peeling, soaking, fermenting and drying of chips in the sun. There are no improved processing tools like chippers and the pestle and mortar are the main traditional tools for processing. The proportion of cassava growing households selling cassava is 50% because of low marketable surplus and poor markets. The main forms in which cassava is sold are dry chips and flour, with insignificant amounts of fresh tubers. The main buyers in recent years are local fishers and private traders who take it to Copperbelt, Lusaka and Congo DR.

The district has identified some areas of arable land where agricultural production is expected to be promoted on a larger scale through resettlement schemes such as, Lukangaba, Matanda, and Kalaba. These areas are considered to be potential farming blocks for the district. There are only three formal industries in Mansa: Mansa Milling Company Limited, Top Star Breweries and Mansa Batteries. WFP/PAM intends to establish a Cassava Milling Plant whose multiplier effects are expected to induce growth on cassava production. Mansa Milling could also be encouraged and assisted to diversify into stock feeds incorporating cassava.

Annex IV: Proposed Outline for the Cassava Value Chains Stakeholders Workshop

Venue: Hotel in Lusaka

Date: Last week of April, two days

Objectives:

1. Bring all cassava market chain participants together to share ideas.
2. Introduction and feedback on the Cassava Value and Baseline Studies
3. Receive the views and experiences of different chain participants and stakeholders.
4. Received, synthesize and agree on action matrices of recommendations from the two studies
5. Development recommendations for actual follow up by identified players

Methodology: The workshop will be participatory, allowing invited stakeholders to share their practical experiences and views. Each session would be concluded with 4-5 recommendations for follow-up. The research papers from the value chain and baseline studies would only be a component of the proceedings, focusing on analyzing and affording a reality check on their recommendations and action matrices.

Timing	Topic	Facilitator
Day One		
Session 1: Introduction and Background		
Morning	Registration	FAO-PM
	Purpose and objectives of workshop	FAO -PM
	Welcome Remarks and Official Opening	MACO – PS FAO Representative
	Highlights of the Baseline Survey	Researcher/PM
	Highlights of constraints and recommendations at different value chain stages	Researcher/PM
	General Discussion	Assigned chair
Session 2: Panel Discussion on Cassava Production and Input Supply Challenges and Solutions		
10 min	Producer realities and challenges	Farmer Association
10 min	Seed inspection and quality challenges	PAM/NGO
10 min	Cassava technologies on the market	MACO-ZARI
30 minutes	General Discussion, Synthesis and Endorsement of Recommendations	Assigned chair
Session 3: Panel Discussion on Cassava Processing and Procurement and Trade Challenges and Solutions		
10 min	Purchasing and trading of cassava from farms	Trader/Farmer
10 min	Purchasing and trading in cassava	FRA
10 min	Processing and trading in cassava	Chukwuma/Processor
10 min	Mansa cassava plant	PAM/WFP
10 min	Industrial processing and demand for Cassava in Zambia	/Miller/Stockfeed
10 min	Cross-border trade in cassava	Cross Borders and Traders Association
30 min	General Discussion, Synthesis and Endorsement of Recommendations	Assigned chair

Session 4: Panel Discussion on Cassava Retailing and Consumption Challenges and Solutions		
10 min	Market specifications for effective retailing	Supermarket
10 min	Using cassava for stock feeds	Tiger
10 min	Using cassava in baking	Baker
10 min	Using cassava products for home consumption	Silva Catering
10 min	Standards and Grades in Cassava trade	ZBS
30 min	General Discussion, Synthesis and Endorsement of Recommendations	Assigned chair
Session 5: Panel Discussion on Institutional and Policy Support to Cassava Development Challenges and Solutions		
10 min	Role of NGOs	PAM
10 min	Role of Private Sector	ZNFU-ABF
10 min	Financing private sector cassava projects	Bankers Association/ZATAC
10 min	Role of the media in cassava promotion	Representative
10 min	Agriculture Market and Trade Policy for cassava	MACO
10 min	International Trade: trends and policy facilitation	MCTI
10 min	Stakeholder coordination on cassava	ACF-ACU
10 min	Provincial Development Plans for Cassava	PPU – Luapula and Central Provinces
10 min	Role of Cooperating Partners in cassava promotion and value chains development	JICA, FAO, WFP, USAID
30 min	General Discussion, Synthesis and Endorsement of Recommendations	Assigned chair
Session 6: Conclusion and Wrap-Up		
10 min	Agree on finalized Action Matrix on Validated Recommendations	Assigned chair
30 min	Official closing	Assigned Dignitary