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**ZAMBIA NATIONAL RICE  
DEVELOPMENT STRATEGY  
(2011 – 2015)**

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### **List of Acronyms and Abbreviation**

AGRA	Alliance for Green Revolution for Africa
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
ASEAN	Association of South East Asian Nations
CAADP	Comprehensive African Agriculture Development Programme
CARD	Coalition for African Rice Development
CASPP	Conservation Agriculture Scaling-up for increased Production and Productivity Project
CIGs	Common Interest Groups
CBO	Community Based Organization
COMACO	Community Markets for Conservation Project
CSO	Central Statistical Office
ECARRN	Eastern and Central Africa Rice Research Network
FARA	Forum for Agricultural Research in Africa
FBO	Faith Based Organization
FNDP	Fifth National Development Plan
FRA	Food Reserve Agency
FISP	Farmer Input Support Programme
FoDiS	Food crops Diversification Support project
GDP	Gross Domestic Product
GRZ	Government of the Republic of Zambia
JICA	Japanese International Cooperation Agency
LIMA	Learning Improved Methods of Agriculture
LVP	Luangwa Valley Project
MACO	Ministry of Agriculture and Cooperatives
NAP	National Agricultural Policy
NEPAD	New Economic Partnership for African Development
NERICA	New Rice for Africa
NGOs	Non-Governmental Organization
NRDS	National Rice Development Strategy
PaViDIA	Participatory Village Development in Isolated Areas
PLARD	Programme for Luapula Agriculture and Rural Development
PROFIT	Production Finance and Technology Project
SCCI	Seed Control and Certification
SSA	Sub-Saharan Africa
TICAD	Tokyo International Conference on African Development
USAID	United States Agency for International Development
WCF	Wildlife Conservation Fund
WARDA	West Africa Rice Development Association
ZABS	Zambia Bureau of Standards
ZDA	Zambia Agency Development
ZARI	Zambia Agricultural Research Institute
ZRA	Zambia Revenue Authority
ZAMSEED	Zambia Seed Company Limited

## 1.0 INTRODUCTION

Rice (*Oryza Sativa L.*) is the number one cereal food crop in the world that is consumed by a population of about 3.7 billion in the world and a large part of this being in Asia alone. Rice is also increasingly becoming a cereal of choice for the growing urban population on the African continent.

Over the past two decades, most countries in Sub-Saharan Africa (SSA), Zambia included, have become net importers of rice from the Far East, According to the World Bank the region imports about 40 percent of its rice supplies, accounting for a third of the rice traded in global markets. Despite the crop having been traditionally cultivated on the continent of Africa for centuries<sup>1</sup>, in 2006, African countries spent an estimated US\$2 billion on rice imports.

There is commitment from international and regional organization to supporting rice development. Agriculture Green Revolution for Africa (AGRA) was borne the Coalition for African Rice Development (CARD) that set a seemingly ambitious target of doubling rice production in Africa from the present 14 million tons/year to 28 million tons/year by 2018, and thus contributing to the major development goal of improving the livelihoods of African people through the promotion of rural development and empowering farm communities and people

The importance of rice as a major contributor to food security in Zambia need to put in place appropriate policies and make the necessary investment in research & development to increase domestic production. This has partly been prompted by the recent experience of sharp increases in commodity prices that resulted in soaring import bills, which adversely affected the balance of payments; a situation that is likely to be compounded by climatic changes.

The Zambian government through the Ministry of Agriculture and Cooperatives has initiated the formulation of a National Rice Development Strategy (NRDS). The outlines of NRDS document represents one such initiative to put in place a strategic framework for developing the rice subsector, following a value chain approach and that is underpinned by a strong stakeholder participation.

## 2.0 REVIEW OF NATIONAL RICE SECTOR

The Government of the Republic of Zambia has realigned agricultural policies to achieve market liberalization. Agricultural market reforms formed

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<sup>1</sup> Rice consumption and cultivation in Zambia is reported to have started in the 17th century with the coming of European explorers.

a key part of the broader programme of liberalization which was initiated with the motive to open up the economy from a highly regulated and over-centralized to a more market-oriented one.

The Government of the Republic of Zambia (GRZ) has placed agriculture as one of the key priority sectors for economic growth and development and poverty reduction. The vision for Government is thus to develop an efficient, competitive, and sustainable export led agricultural sector that assures food security and increased income by 2030. To realize this vision, Government has prepared a National Agricultural Policy (NAP), National Irrigation Policy (NIP), Fifth National Development Plan and now the Comprehensive African Agriculture Development Programme (CAADP). The rice subsector has been realigned to CAADP principles particularly pillar III and IV.

In the last 20 years (1988 to 2008) rice production in Zambia has increased by two and a half times (2.5) rising from 9,293 MT to 24,023 MT. It is emerging as an important cereal food crop in Zambia and this trend is reflected by its inclusion in the National Food Balance Sheet. In the 2006/07 farming season, only about 2 % of land under cultivation was devoted to rice production as compared to 69 % for maize. Despite rice being considered as a minor crop, it is still an important food crop and cash crop for small holder farmers in the region where it is grown. Currently there is an increase in rice production due to increased hectarage while the yield is still low (0.5-1.9 t/ha). The increase in rice production may be attributed to crop diversification response by the small holder farmers who have been switching to commodities that are offering higher net income and that do not require as much expenditure on purchased inputs. However, the production of rice does not meet the national demand.

Rice has been designated by government as one of the major food crops besides maize, cassava and wheat. Therefore, the imperative of increasing rice production by the government and other stakeholders is of paramount importance.

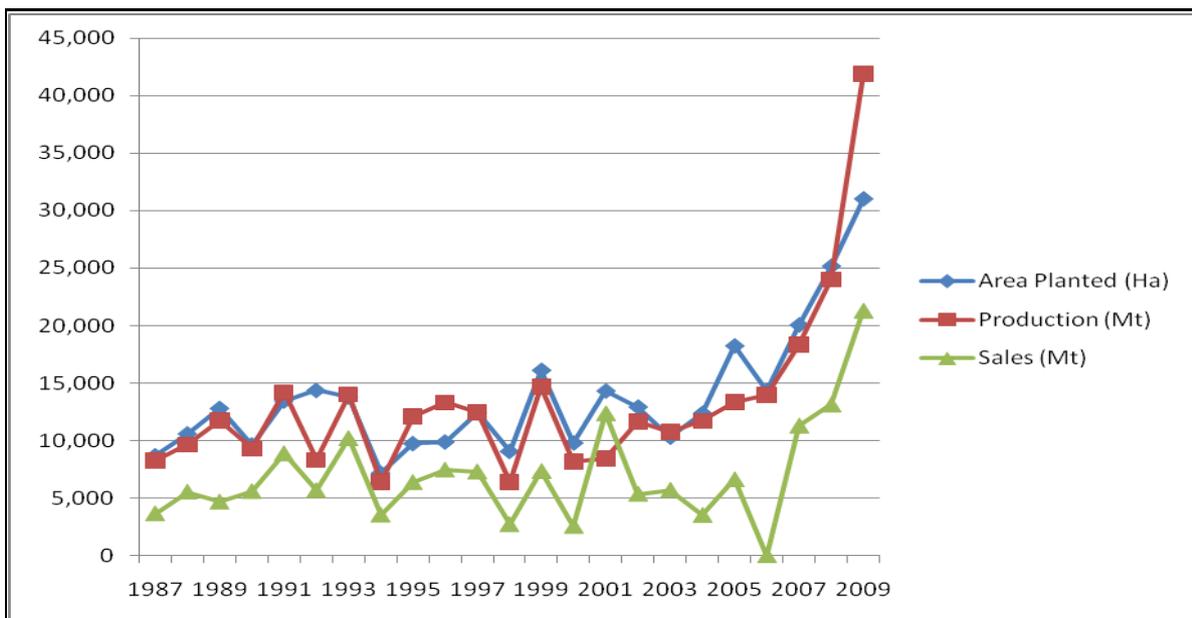
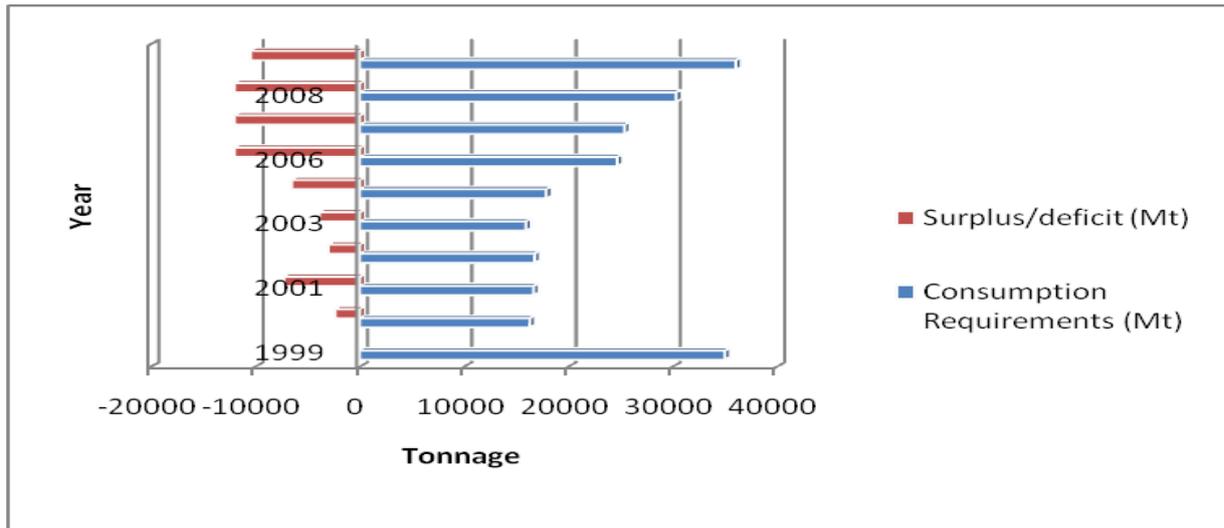


Figure 1: National Rice Hacterage, Production and Sales, 1987–2009  
(Source: MACO/CSO)

Between 30-50% of the annual production is retained for home consumption, but the quantity of rice marketed by both local producers and importers has generally been increasing, in keeping pace with the trend of increased local demand. The increasing local demand is evidenced by the fact that Zambia has been recording deficits on the food balance sheet, as shown in figure 2 below. The deficit is met through formal and informal commercial imports.



Source: MACO/CSO

Figure 2: National Rice Consumption Requirements

Consumer surveys (SNV 2009) have revealed that Zambians generally have a preference for the aromatic rice like mongu, nakonde & chama rice hence the premium price paid for local rice varieties. Most consumers are quite price sensitive and tend to show brand loyalty. Besides price, Zambian consumers mostly buy rice on the basis of quality that encompasses size of the grains, colour and free from grit and other impurities.

In Zambia the main rice varieties are Supa, Malawi faya, Kilombelo, Blue bonnet, Angola crystal, Sumbawanga, Xiang Zhou 5. However, all these local rice seed grain is mixed and all this causes poor processing thus in terms of quality it does not compete favourably with the imported type among consumers and institutional buyers. It is often packed with a great proportion of broken grains, with sand particles, and is chaff, decolourised, which puts it at a price disadvantage.

Small, medium and large- scale farmers are the three main farmer categories in Zambia. According to the 2000 Census of Population and Housing there are 1.3 million agricultural households in Zambia (CSO, 2003). The small-scale producers account for more than 70% of the farming population. However, at least 25% of the small-scale are food insecure each year. Maize is the major crop for small-scale farmers, accounting for 60% of

utilized land during much of the 1990s, followed by drought tolerant crops such as sorghum, millet and cassava. According to CSO 2010, rice is grown by smallscale farmers (66,600 HH) of which 30% are females. The average farm size is estimated to be 0.25 to 1.8 ha.

### 3.0 OPPORTUNITIES AND CHALLENGES FACING NATIONAL RICE SECTOR

Zambia’s total land mass is 752 614 km<sup>2</sup> (Land 740 724km<sup>2</sup>, Water 11 890km<sup>2</sup>). 58% of the total land area is arable and classified as medium to high potential for agricultural production. Only 14% of the arable land is cropped. Water bodies such as lakes and rivers are largely unexploited, with only 11.8% of Zambia’s irrigation potential being utilized. Zambia has a resource endowment for development of a wide range of crops, livestock and fish given the diversity of its agro-ecological regions. (See fig.3)

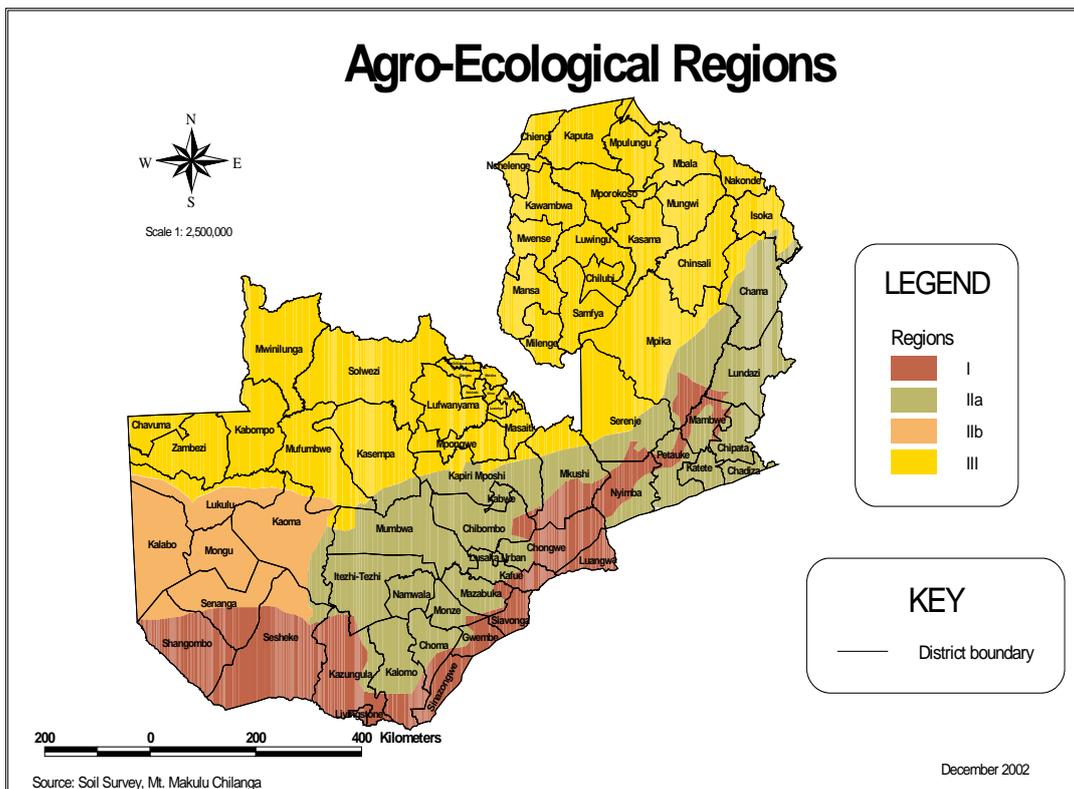


Figure 3: Zambia’s Agro-ecological Zones, MACO-FAO

### 3.1 Challenges

A major challenge facing the agricultural sector in general and the rice subsector specifically, is raising productivity among smallholder farmers to enable them produce sufficient volumes and of a reasonable high quality in order to ensure food security for the growing population and exploit regional export markets. Other factors that can be cited as hindering

the growth and competitiveness of the rice sub-sector in Zambia include the following: targeting small scale farmers

- (i) **Poor quality seed:** Most farmers recycle inferior seed that is a mixture<sup>2</sup> of improved rice varieties, sourced from the neighbouring countries. This affects the final quality in that mixed grain does not mill well. Currently, there is no coordinated system for producing, multiplying and distributing rice seed.
- (ii) **Low level of mechanization:** The reliance by smallholders on traditional hand tools for cultivation and harvesting methods limits rice hactarage<sup>3</sup> and this coupled with the poor agronomic practices largely explains the low yields and production levels. Farmers often fail to harvest in a timely manner, due to insufficient manual labour and therefore end up with over dry rice, which compromises milling quality.
- (iii) **Poor knowledge of irrigation, soil and water management practices:** There is very limited knowledge, among the extension workers and smallholder farmers alike, of integrated water and soil management as well as irrigation technology appropriate for the different rice farming systems, the utilisation of lowland flood plains presently being the dominant one. upland varieties
- (iv) **Fragmented and Uncoordinated Markets:** The low levels of production by the numerous and isolated small-scale producers in the rural areas, result in traders and processors incurring high transaction costs to establish their own purchasing, bulking and storage arrangements. This coupled with the high transport costs due to the poor road infrastructure only encourage opportunistic informal trade.  
Insert data of cross border trade from SNV document
- (v) **Inadequate Modern Processing Facilities and Lack of Quality Standards:** There is a limited availability of modern huskers/mills that could achieve higher milling outturns and even grade the grain. The low outturns from the huskers owned by small scale rice operators and who generally charge high milling charges on account of low capacity utilisation; act as a disincentive to rural producers in the outlying areas. The problem of low throughput is itself partly due to huskers not being strategic placed in centres of production, which makes also the transportation of the paddy costly.  
The lack of quality standards – grades and weights for rice undermines consumer confidence in local rice and hence its low market share relative to imports. Some areas have limited capacity while others have excess.  
The lack of knowledge or weak enforcement of rice standards at international borders leaves the local market exposed to the importation of cheap poor quality rice that is fraudulently

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<sup>2</sup> There is no regulation on rice germplasm quality which leads to the gradual dilution of pure varieties of rice.

<sup>3</sup> On average a smallholder typically grows about half a Lima (1 quarter of an hectare) except for those in rice schemes e.g. those in Chama, Mongu (Sefula) and a few farmers in Lundazi that use ox-drawn implements who grow between a Lima to about a 1 hectare.

repackaged presenting unfair competition to locally produced rice. (ZBS/FRA)

- (vi) **Weak public and private sector institutions and ineffective co-ordination:** There is inadequate capacity in public and private sector institutions involved in rice research and technology dissemination as well as market development both in terms of staffing (e.g. numbers, levels of knowledge and skills) and operational funds to support sustained improvements in productivity and increases in production. Coupled with this are weak management systems to achieve effective collaboration and to promote active participation of key stakeholders in the provision of critical support services.
- (vii) **Poor technical and business management skills:** Generally, there are weak systems and processes for knowledge generation and sharing capabilities within the country; at farm household and community levels and within local public as well as private sector institutions.  
Equally lacking is the entrepreneurial culture and business management knowledge and skills to make possible prudent use of realisable farm incomes to expand or diversify their enterprises and increase their family wealth and wellbeing.
- (viii) **Limited access to seasonal and long-term finance:** Rice farmers, traders and other agribusiness operators in the country, generally decry the limited availability of financial services coupled with the high cost of borrowing that hinders them from investing in high output farming, processing and storage technologies or expansion of their enterprises etc. Local banks that generally have not been responsive in developing appropriate financial products to support agribusiness development in the country, cite the high risks as the main deterrent and given the poor culture of loan repayment, especially among the smallholder farmers vis-à-vis government or donor sponsored credit programmes.
- (ix) **Land tenure:** The land in rural areas (e.g. flood plains) is mostly considered as communal land with individuals only having use rights that are widely traditionally respected. Only a small fraction of this type of land is under title deeds given to individuals. Such a situation does not provide sufficient security of tenure that could motivate an individual to invest in environmentally sustainable landuse practices.

### 3.2 Opportunities

The above notwithstanding, the country is in a good position to develop a rice industry taking advantage of the prevailing favourable market conditions and sustainably exploit its resource base. The major leverage point for rice development is optimising the use of large tracts of arable land, enormous surface and ground water resources and diverse agro-ecological potential that makes possible the production of rice in many regions of the country. Other key factors include:

- (i) The duo role of rice as a food and cash crop for smallholder farmers as well as numerous downstream processing and trading possibilities

which makes it ideally suited to contribute to improved food security, poverty reduction and wealth creation.

- (ii) Scope for expanding rice hacterage by bringing currently underutilised but suitable upland under production using NERICA varieties.
- (iii) Historical high commodity prices and the growing consumer demand both in the country and on the African continent given also that the Asian production frontier of flooded and irrigated environs may not have much scope for further expansion given the urban population pressures and that current yields may be at near the limits of genetic potentiality.
- (iv) Renewed goodwill of international development agencies and foundations to address food insecurity and the problem of extreme poverty in SSA within the NEPAD/CAADP and CARD framework drawing on the experiences of other African countries and JICA's recent experiences of assisting member states of Association of South East Asian Nations (ASEAN) many of whom are also keen on sharing their knowledge and experiences with their African counterparts.
- (v) Prospects of leveraging scientific knowledge (e.g. sustainable agriculture and conservation farming) and participatory extension methodologies that has been proven locally optimising the use of available resources under ongoing and pipeline technical assistance programmes by integrating rice development.

#### **4.0 VISION AND SCOPE OF NRDS**

##### **4.1 Vision**

A vibrant rice sector contributing significantly to economic growth by 2030

##### **4.2 Goal**

“To accelerate commercialization of the private sector led Zambian rice industry to contribute to increased income generation, household and national food security.”

#### **5.0 OBJECTIVES**

The overall objective is to double the rice production in Zambia in the next five (5) years

##### **5.1 Specific Objectives**

- To increase production and productivity of locally produced rice by more than 25% and 75%, respectively by 2015.
- Increase the market share of Zambian produced rice through enhanced promotional activities
- Improve coordination, linkages, information flow and management for increased efficiency and competitiveness in the subsector

## 6.0 STRATEGIES

The NRDS will employ the following major strategies:

- a. Undertake rice varietal improvement through research and by establishing a farmer-community-private sector certified seed production and distribution system;
- b. Expanding hectares under both the rain-fed lowland and upland ecologies; to address specific objectives;
- c. Promoting community managed mini-irrigation schemes and integrated farming practices;
- d. Promoting adoption of technologies suitable for the various categories of producers and processors in the value chain;
- e. Promoting sustainable management of water and soil fertility through adopting good agricultural practices;
- f. Strengthening domestic market linkages and improving access to business development services and cross-border and/or regional markets; and international markets;
- g. Advocacy for a predictable and pro-business trade policy environment that could provide incentives for small holder farmers and private sector investment in the rice sub-sector; and
- h. Establishment of Warehouse receipting system.
- i. Enactment of the Agricultural Marketing Act and the
- j. Agricultural Credit Act.

### 6.1 Prioritization of Rice Ecologies

The strategic choice of where production in the country would need to be scaled-up and promotion activities intensified among the three rice ecologies with consideration of agro-ecological conditions, environmental and socioeconomic factors and in order of development priority will be as follows: (i) rainfed lowland flood plains; (ii) rainfed upland and valleys, and; (iii) Irrigated schemes.

#### (i) *Rainfed lowland flood plains*

This presents the least costly and quicker option for increasing production and rising yields with the advantages being plentiful supply of rainfall and utilising land which currently is underutilised. However, the recurrence of floods, droughts, and possible conflicts between rice growers and cattle keepers in this communally owned land may pose some risks. Apart from this the other limiting factor on land that can be cultivated is that some

flood plains in the country are in ecologically sensitive areas that are under conservation.

(ii) *Rainfed Upland on the Plateau and Valley Areas*

The development of the NERICA varieties that are adapted to upland cultivation, has given the country the option of bringing additional arable land (besides the lowland floodplains and/or hydromorphic environs) under rice cultivation. But the rainfall amount and its seasonal distribution and inherently low soil fertility would limit hectareage that could be brought under NERICA cultivation.

Table 1: Current and Projected Hectarage, Yields and Production of Paddy Rice by Agro-ecological Conditions

Year	Rainfed Upland			Rainfed lowland			Irrigated			Total or Average		
	Area ('000 Ha)	Yield (M/ha)	Prod'n	Area ('000 Ha)	Yield (M/ha)	Prod'n	Area ('000 Ha)	Yield (M/ha)	Prod'n	Area ('000 Ha)	Yield (M/ha)	Prod'n
2008	27.9	1.3	36.9	2.5	1.3	3.3	0.6	1.3	0.8	31	1.3	41
2013	25.2	2.0	50.4	7.2	2.0	14.4	3.6	2.0	7.2	36	2.0	72
2018	21.0	3.0	63.0	10.5	3.0	31.5	10.5	3.0	31.5	42	3.0	126

(iii) *Irrigated Schemes*

There is potential to develop additional and rehabilitate existing small-scale mini-irrigation schemes in certain districts both on the plateau, in the valley areas and the flood plains. This perhaps offers smallholder as well as medium scale commercial farmers the best option for achieving highest yields per hectare, but under relatively higher input level and better management practices.

Investment in costly<sup>4</sup> irrigation infrastructure for smallholder farmers would be avoided, at least not within the 5-year cycle of this strategy, given the challenges of establishing strong governance and management structures at community level to manage (i.e. taking care of operations and maintenance after the phase out project support).

## 6.2 Research, Technology Dissemination and Capacity Building

The present low yield levels and poor quality rice grain is largely due the fact that very few farmers have access to improved rice technologies. And this in turn is a consequence of low level of public investment in research and provision extension services. A slight increase in yields per hectare could thus potentially lead to significant increases in total production even without bringing additional land under rice cultivation.

Therefore a major thrust of the strategy would be to develop and make available, more location specific technologies which will include a package of

<sup>4</sup> It would need to be ascertained whether this option can be justified on a cost-benefit basis i.e. whether locally produced rice under irrigation could compete against imports and whether in effect paddy rice offers higher returns compared to higher value fresh produce.

good quality improved rice varieties with proper management of soil, water, weeds, pests and diseases.

The existing 'mixed' varieties that are preferred by consumers (i.e. possesses excellent culinary traits) and that are adapted well to local conditions and have a reasonably high genetic yield potential will be purified and a community-based seed multiplication and distribution system established.

To achieve sustained improvement in yields and increases in production a much more robust and well-sequenced continuous breeding and variety development, for the of the specific needs in different agro-ecological zones, using local as well as imported rice germplasm will also be essential.

To expand cultivated area and indeed in order to raise productivity appropriate farm mechanization including use of group-owned draught animals, tractors and power tillers as well as processing equipment will be promoted. In light of labour shortages in the face of HIV/AIDS, this would not only minimize the cost of production but also make rice farming more attractive to emerging commercial farmers and the youth and especially the female-headed and other vulnerable households.

Conservation agriculture will be promoted i.e. minimum tillage, IDPM and ISFM including use of water harvesting techniques, inorganic fertilizers in combination with organic nutrients (green manures) to increase and sustain rice productivity.

Given the diversity of rice agro-ecological conditions the present one research station covering the entire is woefully inadequate to cover the country's needs. Hence there is a need to open up more sub-stations in key locations and also strengthen the existing one with human and other resources. In particular there would be need to put in develop a core team of specialized research and extension service staff by putting in them on a fast-track training programme in priority fields e.g. breeding, soil fertility, plant pathology, engineering etc.

In order to up-scale the adoption of proven technologies, extension services delivery by MACO staff, particularly to rice producers, which presently is almost none existence would be revamped. This would entail improving levels of technical knowledge concerning rice production and processing among extension staff working in both MACO and their counterparts from NGOs and the private sector including streamlining management systems to promote better co-ordinated efforts between MACO research and extension teams and between private and public sector extension service providers.

Recognizing that MACO extension services coverage of farm households through its network of over 1650 agricultural camps which presently stand at between 65 to 80 percent is inadequate emphasis it is imperative that more of community based lead farmers as well as NGOs/private run outgrower operations are capacitated to deliver extension services.

Table 2: Number of Rice Researchers and Extension Staff in 2008 and Future Targets

Year	Agricultural Researchers with BSc, MSc, PhD			Research Technicians			Extension workers		
	Total	Rice Specialist (full-time)	Rice Specialist (part-time)	Total	Rice Specialists (full-time)	Rice Specialists (part-time)	Total	Rice Specialists (part-time)	Rice Specialists (part-time)
2008	6	3	3	7	2	5	1200	46	6
2013	10	5	5	31	16	15	1580	120	80
2018	15	8	7	45	25	20	1650	400	115

### 6.3 Strengthening Market Linkages

Trade in local rice is not very well organised which acts as perhaps the single major disincentive for farmers to increased production. Currently, only about 15 to 40 % of rice domestically produced is marketed. The ratio of marketed produce is largely a function of proximity to markets. To increase the flow of marketed rice from the high production districts to the urban areas several actions will be initiated.

There would be need to establish collective marketing systems, including the warehouse receipt system, that would link producers to more profitable end-markets. This would necessitate providing farmer entrepreneurship training, strengthening producer groups, associations and co-operatives as appropriate that are likely to be more efficient than individual informal small-scale traders in bringing expanded volume to the market.

There is also a need to have a more expanded role of the FRA in order to leverage its satellite depot network to aggregate rice in the outlying rural districts for later resale to the processors and urban retailers.

Equally there would be need to facilitate the setting up of private sector driven grain certification system, which is increasingly demanded as a prerequisite by the large retailers and in order to improve the competitiveness of local rice against imports and improve access to cross-border markets.

More private operators in the rice chain should be encouraged in considering the critical role they play value chain development. Supporting the development of Community Agent (CA) besides Producer Associations as a means of promoting competition in order to lower costs and improve quality in both the supply of information and inputs (tools, implements, herbicides, fertilizers, seeds etc. as well as the processing and marketing of rice should constitute a major thrust of this strategy.

Similarly, private entrepreneurs should be supported to set up large milling units with facilities for grading and packaging of rice in high rice production areas on a commercial scale. Such units would also serve as collection centers and increase rice production beyond the present household and subsistence levels.

## **6.4 Governance Structure**

To achieve effective implementation of the NRDS would thus call for the establishment of a coordinating body and/or forum that could be referred to as the Zambia Consortium for Accelerated Rice Development (ZCARD).

By the very nature that activities will be carried out at national, provincial, district and community (block and camp) levels, the ZCARD would constitute steering coordination and strategy monitoring committees set up at these different levels. This will be reinforced by a decentralized monitoring and evaluation system.

Operations of ZCARD may need to be guided by some form of a charter covering a specified period. The aim of the charter is to have a document that would state the mission, describe management systems and processes, delineate the roles of the different actors (government, producer organizations; private players), determine the required investment and the results expected from agreed investment and define the commitments from the government and its partners (funding agencies, producer and traders associations, suppliers of inputs and services). All parties must agree to respect the provisions of the charter, which will be subjected to periodic joint evaluation.

### **6.4.1 Functions**

The ZCARD will be mainly responsible for overseeing priority setting, mobilisation of resources and coordinating the implementation of identified critical strategic issues within NRDS framework as well as monitoring and evaluating interventions. It will also be responsible for fostering partnerships and collaboration with other regional and international rice stakeholders and partners.

### **6.4.2 Composition**

The membership of ZCARD shall be drawn from the following institutions:

- GRZ 1
- MACO Department of Agriculture 1, and other Ministries. MoL 1, MCTI 1, MFNP 1, MLGH 1
- ZARI will represent the Researchers, 1
- UNZA 1
- 1 NGO's representative (All Rice related should choose one to represent them
- 1 representative from Financial Institutions (Bankers Association of Zambia)
- 1Regulatory bodies (SCCI, ZBS including ZRA)
- 1International Development Organisations (Multilateral and Bilateral Agencies)

### **6.4.3 Structure**

To enhance the proper implementation of NRDS there would be need to have an organizational structure which will be headed by a champion who will be designated by the Minister of Agriculture and Cooperatives in consultation with members of ZCARD. To create ownership of the NRDS within MACO, the Permanent Secretary of Agriculture will designate a lead

implementing department on a rotational basis to ensure that all relevant MACO Departments are proactively engaged. This could also serve as a Secretariat in the interim.

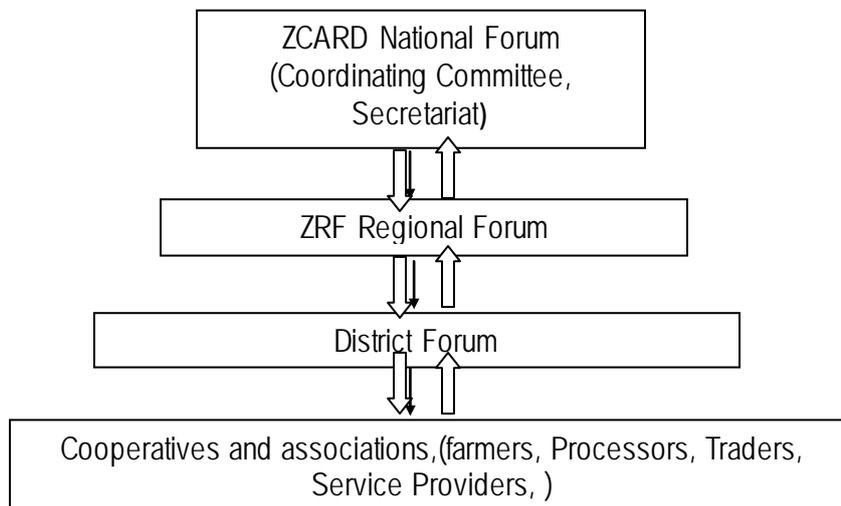
#### 6.4.4 Financing

Government commitment to rice promotion would be demonstrated by MACO as the lead ministry allocating funds for the operationalisation of the NRDS. On an interim basis and before a budget line is created for supporting such initiatives, operational funds may have to be sourced from contributions from on-going projects under MACO or NGOs.

#### 6.4.5 Implementation Arrangements

NRDS aims at providing adequate institutional framework to mobilize sufficient resources to achieve its objectives in rice production. Effective implementation of NRDS will depend on the active, integrated and holistic involvement of all the rice stakeholders.

- MACO, Minister of Agriculture shall appoint members of the ZCARD
- MACO, Permanent Secretary of Agriculture shall designate the lead implementing Department and the CARD focal person
- ZCARD Co-ordinating Committee members will appoint its Secretariat from stakeholders.
- ZRF in consultation with ZCARD shall facilitate members to the regional forum. The regional forum shall include facilitators ie NGOs, MACO etc.
- ZRF in consultation with regional forum shall facilitate members to the District forum. The district forum shall include facilitators ie NGOs, MACO etc.



MACO Departments will continue providing increased support to rice promotion activities by committing more staff time as well as funds under on-going and upcoming programmes to rice research and extension. The departments and/or respective programmes that are currently directly or indirectly supporting rice development include:-

- Zambia Agriculture Research Institute (ZARI) – has been conducting rice (NERICA) varietal trials and seed multiplication with funding provided under the JICA-funded FoDiS and PAViDIA projects;
- Department of Agriculture – is and plans to scale up the provision of extension services to farmers on rice technology based on recent research, with funds provided under its regular programme and from on-going bilateral funded projects e.g. PLARD and CASPP;
- Seed Control and Certification Institute (SCCI) – has registered new rice varieties (including NERICA I and IV), and will be collaborating with ZARI, ZAMSEED and the USAID-funded PROFIT Project in varietal screening, varietal purification as well as certification of improved seeds and enforcement of seed standards.
- Department of Agribusiness and Marketing – under the Fertilizer Input Support Programme (FISP) contracted ZARI to undertake a survey of rice seed producers which would form as the basis for identifying suppliers of improved seed to the beneficiary of smallholder farmers.
- Food Reserve Agency (FRA) – has been expanding the coverage of rural districts from which to buy rice for the strategic food reserve.

Additionally, the government has also provided tax incentives under the ZDA Act to promote investment in agricultural production in general and that could help stimulate increased local rice production. This include a reduction of duty on farm implements such as two- wheeled tractors that are used on rice farms and on rice mills, rice harvesters and mills.

### **Zambian Rice Federation objectives, structure and functions**

#### **Mission**

The Zambia Rice Federation mission is to promote and protect the interest of producers, millers, traders and allied businesses involved in the rice industry.

#### **Objectives**

The objectives of the federation shall be

- a) Promotion of rice production, including increase in quantity and quality of rice produced; encourage production and the use of varieties suited to the conditions of the region; and introduction of good agricultural practices for rice.
- b) Improvement of marketing, grading and storage and processing systems of rice within Zambia and with respect to external trade in rice.
- c) Dialogue with government, focusing on critical policies and regulations affecting the sub-sector i.e., sub-sector competitiveness, trade policies, market access programs, food aid appropriateness, environmental policies, food safety, rice insurance policies, agricultural budget allocations, etc.
- d) To enhance industry knowledge and disseminate information that advances the rice industry

- e) To conduct research that addresses the need and priorities of the rice industry to ensure long term sustainability and future competitiveness
- f) To mobilize resources in order to support implementation of activities in the rice industry.

**Composition, structure and functions of the federation.**

- a) The federation shall comprise of its board, secretariat and members;
- b) The board shall comprise of elected officers. The office bearers shall include the
  - i) Chairperson
  - ii) Vice chair person
  - iii) Chief executive officer (CEO)
  - iv) Six board members
- c) The board shall comprise two categories i.e
  - Rice producers, cooperatives and associations
  - Rice millers and association
  - Rice traders and association
- d) The six committee members will be elected by atleast one representative from each one of the three zones as follows: Zone I(Southern/Western), Zone II(Eastern/Lusaka/Central), Zone III (Northwestern/Copperbelt), Zone IV (Northern/Luapula)
- e) The term of office for the board, shall be two years, elected at the AGM; with a maximum of two years.
- f) the responsibilities of the board will include:
  - Oversee the federations Purpose, values and the strategy to achieve its purpose and to implement its values
  - Approve and review overall business strategies, significant policies and structure of the federation
  - Provide oversight and guidance to the secretary so as to enhance the efficiency and effectiveness of the federation
  - Ensure that the effective systems of control are in place to safeguard the assets of the federation
  - Appoint the CEO and the participant in the appointment of senior management in the federation
  - Ensure that the federations complies with all statutory and legal requirements, including prescribed codes of the best practice
  - Appoint relevant subcommittees
- g) The duties of the chair person shall be:
  - i) To chair the meeting of the federation
  - ii) To serve as the official spokesperson of the federation
  - iii) Oversee the general operations of the federation to ensure effective outputs of its activities and efforts and general duties associated with the traditional role of the chair person

- h) The duties of the vice chairperson
  - i) To be the first designated person to chair the meetings of the federation in the absence of the chairperson
- i) The duties of the committee members
  - i) to participate in board meeting
  - ii) to participate in subcommittees
  - iii) to help the board in decision making

## **7.0 SUSTAINABILITY**

At the national level, there is a clear evidence of sustainability given the thorough attention that the Government is devoting its resources for developing rice sub-sector which is also reflected in draft Sixth National Development Plan and provision for rice seed distribution program in FISP and buying of rice under Food Reserve Agency. The establishment of Zambia Consortium Accelerated Rice Development (ZCARD). The network established between national institutions with international institutions associated with rice development would ensure a regular of new technologies.

The participation of value chain actors (beneficiaries) through ZRF in the planning and implementation process of the strategy would contribute to the sustainability of the strategy as they would feel owners of the initiated interventions. The increased production and productivity would also increase competitiveness to the rice value chain.

## **8.0 ENVIRONMENTAL ISSUES**

Implementation of NRDS is among interventions which could have negative environmental impacts if not well planned. To address environmental issues in the course of NRDS implementation, the following would be considered:  
Creating continuous awareness and monitoring of fertilizer and agro-chemical use to reduce environmental problems associated with it;  
Training of farmers on environmental issues related to irrigated agriculture;  
Training of technical staff on environmental issues so that they know the implication of irrigation development on environment; and  
Cumulative Environmental Impact Assessment would be undertaken after every five years.  
Integrated Pest Management Capacity Building would be undertaken

## **9.0 CONCLUSION**

This strategy on rice development has been prepared taking into consideration the existing potential and opportunities to enhance rice sub-sector. However, priority would have to be taken due to the limited resources available. In particular, emphasis would need to be placed on research and technical assistance for expanding and improving paddy production and output of milled rice. This can be achieved through adaptation of existing and new improved technologies as well as up and / out- scaling of such technologies in order to maximize their impact. In promoting technology transfer and adaptation, cooperation between different national and regional institutions engaged in the development of these technologies would be sought. This approach would help to minimize over-lap in research activities and capitalize on the research results.

Another area of priority would be resource management to encourage sustainable rice development. In pursuit of this, efficient and effective use of land resources and agro-chemical inputs as well as sound agronomic and soil and water conservation practices that ensure long term environmental and crop stability would be supported. Furthermore, due attention would also be given to development activities related to improving market information, credit, market promotion and distribution in order to increase transparency in trade, improve access to markets and promote greater stability in rice market. Measures for encouraging the greater consumption of rice in new expanding markets and for boosting the demand would also feature in the strategy.

In view of the above, this strategy can be successful but implies changing business as usual and calls for some innovative approaches and partnership and an overall enabling environment for such development to occur.



## Annex II. Strategic Framework

KPI	OBJECTIVES	STRATEGIES	MAJOR ACTIVITIES
	<p>I. Increase rice production by increasing yields per unit area and through expansion of area under both rain-fed upland and lowland ecologies</p>	<p>KPI 1: % increase in yields and production</p> <p>KPI 2: % farmers adopting technologies being promoted e.g. recommended seeding rates, planting methods, weeding frequencies, fertiliser application rates, crop rotation, IPDM practices etc.</p> <p>KPI 3: % farmers using improved seed</p>	
		<p>Establish a research and seed supply network encompassing public-private sector and community systems for the multiplication, production, distribution and promotion of improved seed varieties</p> <p>Develop environmentally sustainable and integrated production systems appropriate for the different ecologies and suitable for the different scales of producers</p> <p>Promote integrated farming in the lowland ecologies that combines rice growing with fish, poultry and livestock farming, and off-season market gardening</p> <p>Promote generation/diffusion of innovations and appropriate mechanization technologies for rice cultivation.</p>	<ol style="list-style-type: none"> <li>i. Conduct on-station and farm trials to identify seed varieties with suitable traits and that are suitable for the local upland and floodplain ecologies</li> <li>ii. Conduct on-station and farm trials to develop the required technologies – Integrated Soil Fertility Management (ISFM), Integrated Pest and Disease Management (IPDM) etc.</li> <li>iii. Train extension staff/farmers to ensure adoption of Good Agricultural Practices (GAPs)</li> <li>iv. Train seed multipliers with special emphasis on the women and the youth</li> <li>v. Implement quality control with decentralized mandatory certification of foundation and producer seed</li> <li>vi. Promote use of animal draught power in areas of low production</li> <li>vii. Promote use of improved agricultural equipment (motorised tillers and implements, water pumps, tractors and accessories, transplanters and seed drills) train owners and local artisans in their operation and maintenance</li> <li>viii. Construct/rehabilitate simple and low cost water control structures (dykes, bunding, catchment areas protection, drainage) in the rain-fed lowlands and gravity-controlled mini-irrigation schemes</li> <li>ix. Develop skills of extension staff/lead farmers to mobilize communities to participate in the development, operation and maintenance of water control structures</li> <li>x. Conduct studies into land suitability, landuse and delineation for rice-based cropping systems</li> <li>xi. Conduct tests to establish soil fertility status and appropriate</li> </ol>

			amendments
	II. Increase the market share of the locally produced rice	<p>KPI 4: % farmers and/trader adopting recommended drying and storage methods.</p> <p>KPI 5: % processors adopting recommended processing technologies</p> <p>KPI 6: % increase in milling outturns (whole grain: broken grain ratio)</p> <p>KPI 7: % increase in capacity utilisation of huskers and mills</p>	
		<p>Improve quality and reduce field and post-harvest handling grain losses by promoting generation/diffusion of innovations and appropriate mechanization technologies for rice harvesting and processing adapted to the requirements for the different levels of producers, processors and traders other actors in the value chain</p> <p>Promote the creation of service cooperatives in all layers of the chain that support mechanisation, value-addition (rice parboiling utilization of rice by-products) and management of irrigation infrastructure</p>	<ol style="list-style-type: none"> <li>i. Promote use of motorised or manual harvester-threshers appropriate for small-medium scale farmers in high production areas under either cooperative and private ownership</li> <li>ii. Implement quality controls at all stages of the value chain and a quality assurance system for ensuring compliance to set local/minimum international rice quality grades</li> <li>iii. Upgrade single-pass mills (2/3 tons per hour) by adding attachments while processing centers will be equipped with storage facilities for paddy/milled rice</li> <li>iv. Promote mini rice mills and efficient huskers depending on their relative importance in the major rice production zones</li> <li>v. Promote private sector investment into modern medium scale rice mills (equipped with pre-cleaners, destoner, hullers, polishers, paddy separators, aspirators, and graders) in high production areas</li> <li>vi. Promote use of drying patios, tarpaulins and parboiling equipment to produce parboiled rice</li> <li>vii. Design marketing strategies – branding and promotion, better packaging, retailing in supermarkets and organisation of food bazaars</li> <li>viii. Establish centrally located bulking centers and/or certified warehouses for milled rice in the major producing and consumption areas</li> <li>ix. Capacitate women groups, cooperatives and individual entrepreneurs to acquire and operate huskers and parboilers</li> </ol>

Annex II CONTINUES

	<p>III. Increase access to financial services and strengthen linkages to markets</p>	<p>KPI 8: No. of farmers and MSEs accessing business and financial services</p> <p>KPI 9: Amount of loan portfolio going towards rice value chain development</p> <p>KPI 10: No. of farmer-buyer networks created</p>	
		<p>Promote innovation among Banks, Leasing Companies and MFI to develop customised seasonal, trade and long-term financial products and services and to expand their outreach</p> <p>Increase access by small producers and micro and small enterprises (MSEs) operators to business development services</p>	<ul style="list-style-type: none"> <li>i. Mobilize and facilitate key actors (smallholder producers, processors, traders) into cohesive and well-functioning Common Interest Groups (CIG) or associations and cooperatives</li> <li>ii. Facilitate linkages of CIG to markets (buyers), credit sources and suppliers inputs and equipment</li> <li>iii. Conduct training for producers, processors and traders in entrepreneurship and simple business management including marketing, costing and record keeping, cash and credit management etc.</li> <li>iv. Sensitize producers and trader on the advantages of using bulking centres and certified warehouses</li> <li>v. Design a matching grant facility to be managed by a MFIs and supervised by representatives of farmers, processors, traders and suppliers of inputs and equipment</li> <li>vi. Promote use of risk management products such as micro-insurance and matching payment times with the crop calendar</li> <li>vii. Promote use of the warehouse receipt system by collaborating with WFP/ZAMACE under the Purchase-4-Progress Initiative</li> <li>viii. Promote formation of savings and credit schemes among the rice farmers with networks to MFIs</li> </ul>

Annex II CONTINUES

	<p>IV. Build a strong public-private institutional framework to oversee research, technology generation and dissemination and co-ordinate the implementation of NRDS including monitoring performance of the entire value chain</p>	<p>KPI 11: Number of effective business networks created KPI 12: Number of innovations generated and adopted</p>	
		<p>Remodel research-extension services delivery in the context of a new paradigm of innovation systems and public-private sector partnerships</p> <p>Strengthen public-private sector research, technology generation and dissemination institutional capacities</p> <p>Enhance human resource capabilities in crop research, agricultural and irrigation engineering, technical and business advisory support services</p>	<ul style="list-style-type: none"> <li>i. Identify and acquire germplasm from international and regional sources</li> <li>ii. Characterize and evaluate germplasm for the different agro-ecological zones</li> <li>iii. Rehabilitate and construct new infrastructure such as cold storage facilities and warehouses</li> <li>iv. Strengthen cooperation among local public and private researchers and with international research centers</li> <li>v. Train local technicians, artisans or fabricators the local manufacture of farming tools, huskers, harvesters and driers etc.</li> <li>vi. Develop a database for agricultural mechanization (nature and type of equipment available, manufacturers and fabricators and equipment they, type of material etc.)</li> <li>vii. Design training manuals, videos, fact sheets and posters on the rice value chain development</li> <li>viii. Train extension staff from the Private Sector, NGOs and MACO with modern knowledge on rice and rice-based cropping systems</li> <li>ix. Promoting farmer – to – farmer extension through FFS and FBS.</li> </ul>

			<ul style="list-style-type: none"> <li>x. Promote integration of rice and livestock production through utilisation of by-products (straw, chaff, bran and other residues)</li> <li>xi. Conduct exposure visits for farmers and others involved to see experiments in the fields of participating farmers</li> <li>xii. Conduct specially tailored programmes for the youth aimed at nurturing a new generation of properly trained farmers intended to be the innovators in the rural world, to serve as extension officers, community technicians and producers' leaders</li> </ul>
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Annex III: Rice Value Chain – Current Status, Constraints and Interventions

Key Issue/Current Status	Constraints	Interventions
<b>I. Input Supply</b>		
Recycling of 'mixed' rice seed varieties	<ul style="list-style-type: none"> <li>- Unavailability of improved seed varieties</li> <li>- Lack of a comprehensive rice seed breeding Programme</li> <li>- Lack of knowledge among producers on the production and maintenance of viable and pure seed</li> <li>- Absence of a mandatory rice seed certification programme</li> </ul>	<ul style="list-style-type: none"> <li>- Increase research efforts on germplasm selection and characterisation, varietal adaptation trials and multiplication of foundation</li> <li>- Develop a rice seed distribution network that will involve training and certifying seed growers and a community managed seed credit scheme</li> </ul>
Producers lacking access to appropriate and mechanised farm implements e.g. for cultivation, harvesting, threshing and drying	<ul style="list-style-type: none"> <li>- Weak local research and technology development capacities in both public and private sectors</li> <li>- Few local dealers specialised in rice equipment</li> <li>- Shortage and high cost of capital finance</li> </ul>	<ul style="list-style-type: none"> <li>- Strengthen Private-Public Sector collaboration in identification, adaptation of appropriate technologies</li> <li>- Training of local artisans and technicians in repair and maintenance of rice equipment</li> <li>- Development of appropriate loan products e.g. leasing</li> </ul>
<b>Production and harvesting</b>		
Low yields and low production	<ul style="list-style-type: none"> <li>- Low level of knowledge among the farmers of good agricultural practices</li> <li>- Poor public extension services characterised by poor funding and low staffing levels</li> </ul>	<ul style="list-style-type: none"> <li>- Training for extension workers in rice agronomic practices and increase number of demonstration sites and Farmer Field Schools (FFS)</li> <li>- Promote adoption of upland rice varieties (NERICA)</li> </ul>
Low hactorage per farm household	<ul style="list-style-type: none"> <li>- Occurrence of droughts and floods in rain-fed lowland ecologies</li> <li>- Labour shortages for ploughing, weeding and harvesting</li> <li>- Lack of a reliable market or guaranteed producer prices</li> </ul>	<ul style="list-style-type: none"> <li>- Promote use of appropriate soil and water management methods</li> <li>- Promote use of affordable semi-mechanized or fully</li> </ul>

		<p>mechanised farming equipment</p> <ul style="list-style-type: none"> <li>- Promote use of structured supply contracts between traders and farmer groups</li> </ul>
High field losses	<ul style="list-style-type: none"> <li>- Low level of knowledge among the farmers of proper timing of harvesting</li> <li>- Use of varieties that are susceptible to pests and diseases and prone to lodging</li> </ul>	<ul style="list-style-type: none"> <li>- Training for extension workers in good harvesting practices and increase number of demonstration sites and Farmer Field Schools (FFS)</li> </ul>

Annex IV

<b>Post-harvest Handling and Processing</b>		
Poor quality milled rice that does not compete favourably against imports	<ul style="list-style-type: none"> <li>- Poor quality dried rice grain due to improper timing of harvesting, poor drying methods including use of dirty surfaces that result in contamination with stones and odours</li> <li>- Use of inferior rice processing technology with no grading facility</li> </ul>	<ul style="list-style-type: none"> <li>- Training for farmers, traders and millers in appropriate drying and handling methods to assure the quality of the grain through the entire supply chain</li> </ul>
<p>Low processing out-turn and very low capacity utilisation rates resulting in mills/huskers operating at high operating costs</p> <p>Few huskers and mills most of which operate on a toll (fee) milling basis and fewer on a processor-owned basis</p>	<ul style="list-style-type: none"> <li>- Low level of production of properly dried and uniform grade paddy</li> <li>- Insufficient and irregular supply of good quality paddy with shortages between December and May</li> <li>- Too many intermediaries lower the margins for all players in the chain particularly farmers and millers</li> <li>- Lack of term finance to promote investment in modern mills</li> <li>- Lack of seasonal credit &amp; finance for value addition</li> </ul>	<ul style="list-style-type: none"> <li>- Feasibility study to establish the costs and benefits of using relatively more efficient rice processing technology e.g. multi-pass as opposed to single pass mills</li> <li>- Promote better location of mills/huskers</li> <li>- Lack of electricity power supply and power outages result in the use of costly diesel powered mills.</li> </ul>
<b>II. Distribution and Marketing</b>		
<p>Numerous informal traders handling low volumes</p> <p>Poor branding of local rice</p> <p>Ineffective enforcement of tariffs by ZRA</p>	<ul style="list-style-type: none"> <li>- low selling prices of processed rice</li> <li>- Poor branding of local rice</li> <li>- Lack of knowledge of grades and quality standards undermines enforcement</li> <li>- Inadequate working capital and storage facilities undermine bulk purchases and scale economies</li> </ul>	<ul style="list-style-type: none"> <li>- Promote the establishment of community or farmer organisation or cooperative constructed and managed bulking/trading centres on a matching grant basis</li> </ul>
<p>Low Consumer Preference</p> <p>Low market penetration of the locally produced rice</p>	<ul style="list-style-type: none"> <li>- Poor milled quality and misleading labelling of the packaged rice</li> <li>- Low consumer awareness of rice types and methods of preparation</li> <li>- supply of mixed varieties, contaminated and poor dried grain resulting in a high percentage of breakages at milling</li> </ul>	<ul style="list-style-type: none"> <li>- Promote consumer awareness of the Zambian rice in terms of quality and taste and brands</li> </ul>
<p>Opportunistic trading with very few formal supply contracts between famers and traders/millers</p>	<ul style="list-style-type: none"> <li>- Lack of proper storage facilities in the production areas</li> <li>- Lack of an effective regulatory body to enforce standards on rice</li> <li>- Incidence of unfair competition from imported rice that is not appropriately classified and is thus charged at a lower tariff</li> </ul>	

III. Crosscutting		
Weak Institutional framework for promoting a competitive rice industry	- Weak producer, processors and traders organisations and networks	- Implement measures for institutional capacity building of farmer, trader and processors associations and networks so that they are capable of implement value chain enhancement and raising the profile of rice through lobbying for policies and increased funding to rice development.
Limited skilled and experienced cadre of professional and technical staff (breeders, agronomists, soil scientists, plant protection scientists) specialising in rice	- Low prioritisation of rice and inadequate staffing levels and funding allocated to rice	-
Poor state of feeder roads	- High transaction and transportation costs	- Increase funds for feeder road rehabilitation maintenance through identification new revenue sources such as toll fees
Poor provision of technical and marketing information good agricultural practices (GAPs) supply and demand, prices, quality standards	- Limits the development of coordinated markets and scale of operations	- Strengthen capacities of both public and private sector institutions to collect and share information using cost-effective means e.g. Community Radio Stations
Shortage and high interest of finance	- Perceived high risk profile of traders on the basis of culture of high default rate - Lack of innovation by banks to develop appropriate lending products	- Develop a multi-stakeholder governance structures at national, provincial and district levels for coordinating implementation of the strategic framework and monitoring performance