

NATIONAL RICE DEVELOPMENT STRATEGY (NRDS) -



THE GAMBIA



By
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ACRONYMS

ACP	Africa Caribbean and Pacific Countries
ADB	African Development Bank
AGOA	African Growth Opportunities Act
ANR	Agriculture and Natural Resources
AR4D	Agricultural Research for Development
CAADP	Comprehensive Africa Agriculture Development Programme
ARREV	Agricultural Research Review Meetings
CARD	Coalition for African Rice Development
CDC	Commonwealth Development Corporation
CPCU	Central Projects Coordination Unit
DAS	Department of Agricultural Services
EBA	Everything But Arms
ECOWAS	Economic Commission of West African States
ERP	Economic Recovery Programme
FFHC	Freedom From Hunger Campaign
FAO	Food and Agricultural Organization of the United Nations
FASDEP	Food and Agricultural Systems Development Project
GATT	General Agreement on Trade and Tariffs
GCAVP	Gambia Commercial Agriculture and Value Chain Management Project
GIEPA	Gambia Investment and Export Promotion Agency
IBAS	Indigenous Business Advisory Services
IBRD	International Bank for Reconstruction and Development
ICT	Information Communication Technology
IDA	International Development Agency
IFAD	International Fund for Agricultural Development
IRRI	International Rice Research Institute
JIRCAS	Japanese International Research Centre for Agricultural Science
JPSP	Jahally/Patcharr Small-holder Project
LADEP	Lowland Development Project
MDI	Management Development Institute
MOA	Ministry of Agriculture
NARI	National Agricultural Research Institute
NARICT	National Agricultural Research Institute for Chemical Technology
NASS	National Agricultural Sample Survey
NEMA	National Agricultural Land and Water Management Development Project
NERICA	New Rice for Africa
NRDS	National Rice Development Strategy
NRDSC	National Rice Development Steering Committee
PRC	People's Republic of China
PRSP	Poverty Reduction Strategy Paper
PAGE	Programme for Accelerated Growth and Employment
RIDEP	Rice Development Project

RAD	Regional Agricultural Directorate
R&D	Research and Development
RFS	Rice Farm Scheme
RRDSC	Regional Rice Development Steering Committee
SDF	Social Development Fund
SSWCP	Small-Scale Water Control Project
TICAD IV	Fourth Tokyo International Conference on Africa Development
TTAM	Taiwanese Technical Agricultural Mission
TTM	Taiwanese Technical Mission
URR	Upper River Region
VISACA	Village Savings and Credit Association
VPC	VISACA Promotion Centre
WARDA	West African Rice Development Association
WAAPP	West African Agricultural Productivity Programme
WB	World Bank
WFP	World Food Programme
WTO	World Trade Organization
WUA	Water Users Association

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EXECUTIVE SUMMARY

INTRODUCTION AND BACKGROUND

1. Located in the valley of the Gambia River on the west coast of Africa, The Gambia possesses a good range of suitable ecologies for rice production. Thus, The Gambia is one of the 11 Second Group (G2) countries of Coalition for African Rice Development (CARD) initiative launched in May, 2008 and started to formulate its National Rice Development Strategy (NRDS), after the Third General Meeting of CARD held in Arusha, Tanzania, in May 2010.
2. Given its importance as a dietary staple for at least 62.8% of the inhabitants on the planet, the global trends in rice production and trade portend an adverse effect on the deepening state of poverty in net milled rice importer countries like The Gambia.
3. More importantly Africa's share in global milled rice imports is on an increasing trend against the backdrop of a fairly increasing trend in its share of global paddy rice production but a stagnant trend in its share of international milled rice export. The implication of this African rice producers-cum-consumers like The Gambia is one of looming worsening food insecurity.
4. Rice is the staple food of The Gambia with a per caput consumption of 117kg per annum of which only 17% is produced locally. The country has a long history of rice importation to meet its deficit in consumption.

REVIEW OF THE NATIONAL RICE SECTOR

5. Systematic attempts to exploit the rice development potentials of the country commenced with the ill-fated Colonial Development Corporation's Rice Farm Scheme of 1951. Since 1966 the government adopted and pursued a policy of rice self-sufficiency through the implementation of a Taiwanese-Gambian Technical Assistance Agreement and an IBRD-IDA-supported project from mid-60s to mid-70s.
6. The foregoing investments notwithstanding, domestic milled rice production in the 1980/2005 period declined from a high of 26,474 tonnes in 1980/81 to a low of 13,082 tonnes in 2004/05 while milled rice imports soared from 33,680 tonnes in 1980/81 to 73,825 tonnes in 2004/05. Although significant increases were realized in both cultivated area and production during the 2001/02 – 2010/11 decade, these had no impact on the rice self-sufficiency ratio,
7. Although the increase in cultivated area derived from expansion in upland rice cultivation engendered by the introduction of NERICA rice varieties, lowland ecologies have greater potential for rice production. Thus PRSP II recommended concentrating future investment on irrigated rice cultivation which is being orchestrated by the current ANR policy. Also as part of its commitment under the CAADP the government has agreed to

increase public service investment in agriculture by a minimum of 10 percent of the national budget which will enhance pursuit of its rice self-sufficiency policy.

8. This commitment is reflected in a series of policy implementation actions such as the five main focal areas of the Gambia National Agricultural Investment Programme (GNAIP) and the commissioning of the West African Agricultural Productivity Programme (WAAPP), *Nema*, Food and Agriculture Systems Development Project (FASDEP) and Gambia Commercial Agriculture and Value Chain Management Project (GCAVMP). Thus, pursuit of its rice self-sufficiency policy will be a prime candidate in these initiatives. The most recent rice specific time-bound policy action is the pronouncement of a Vision of rice self-sufficiency by the year 2016 by His Excellency the President.
9. Despite the recognized excellent dietary properties of locally produced rice, urban rice consumers generally prefer the polished imported rice, dispositions which favour the importers and encourage importation since 100% broken rice is cheaper than whole grain rice in the international market. Thus over 63 000 metric tons of polished rice, equivalent to 60% of the total rice requirement, was imported in 2010.
10. In view of its importance as the staple food of the country a wide range of typology of actors are involved at every stage of the rice value chain as direct or secondary and/or intermediate actors. These include farmers, processors and traders of varying numbers.
11. Women are almost exclusively responsible for rain-fed and tidal swamp rice and men cultivate irrigated rice but on-farm traditional milling of rice is also exclusively done by women whereas both women and men are involved in the commercial milling of rice in groups or individually. Similarly both men and women are involved in marketing of rice mainly individually.
12. In terms of the relative gender management responsibilities for rain-fed rice, over 77% of upland rice fields accounting for 87% of cultivated areas are owned by women and about 89% of fields accounting for 54% of total area cultivated under swamp rice are owned and managed by women. The lower percentage of swamp rice fields owned by women is reflective of the fact that irrigated rice which is mostly owned by men is also included in the swamp rice hectareage.

CHALLENGES & OPPORTUNITIES FACING NATIONAL RICE SECTOR DEVELOPMENT

13. Salient among the myriad of challenges facing rice production are six in number. These are input-related constraints, agronomy-related constraints, irrigation and water management related challenges, pre- and post-harvest mechanization technology challenges, land tenure and other social constraints and general constraints of either socioeconomic or technological in nature.
14. Similarly salient among the myriad of opportunities for efficient local rice production are six in number. These stem from climatic, natural resource and geopolitical circumstances and policy environment and include: good production potentials for both

rain-fed and irrigated agriculture; potential of local rice in rural poverty reduction and economic growth; potential sources of high yielding and adaptable varieties; availability of technology dissemination channels; existence of a conducive policy environment; and, favourable trans-boundary/regional trade environment.

APPROACHES AND PRIORITY AREAS

15. Cognizance of the natural, historical and regional distribution pattern of rice production resource as well as the gender aspects vis-a-vis the need for market-led, commercialized, efficient, competitive and dynamic rice industry, the NRDS will adopt a multi-prong approach. This would include: agro-ecology-based promotion; promotion of both small- and large-scale production; gender consideration; value chain approach; and environmental sustainability.
16. The scope for expanding upland rice production in the immediate-term is negligible but the scope for expansion of lowland rice production is huge. Thus the NRDS will emphasize intensification of both upland and lowland production systems and expansion of lowland production systems. The priority areas in this regard will be development of input markets, agronomic practices, community participation, irrigation infrastructural rehabilitation and post-harvest handling.

VISION AND SCOPE OF NRDS

17. The Gambia has 216,121 ha of lowland ecologies suitable for rice production. Thus the NRDS is founded on a vision of “*self-sufficiency in rice production*” by the year 2024.
18. The overall goal of the NRDS purpose is to enhance the enabling environment for systematic exploitation of the vast natural resource potentials, mitigation of the priority constraints in the resource base, provision of production oriented technologies suitable for broad-based participation and adoption by the majority of rice farmers for efficient rice production.
19. The over-arching objective of the NRDS (2015-2024) is the creation of a market-led, commercialized, efficient, competitive and dynamic rice industry which maximizes enhancement of food security and poverty reduction.
20. Thus, based on equal emphasis on intensification in both upland and lowland production systems and expansion of lowland production systems the NRDS is projected to achieve a production scope and target of 322,600 tonnes of milled rice in 2024 with sustained commitment of scientific and technical personnel and financial and human resource provision by the government.

SUB-SECTORAL STRATEGIES

21. The overall strategic orientation of the NRDS will entail six sets of strategic actions. These actions are:

- i. Land Development, Irrigation Development and Paddy Production;
- ii. Post-harvest losses handling;
- iii. Processing (value addition) and Marketing;
- iv. Seed Development and Varietal improvement;
- v. Rice Production Inputs Supply Distribution; and,
- vi. Pests and disease management.

22. Consistent with the suggested approaches in addressing the priority areas identified in its objective framework, the NRDS is designed to have eight sub-sectoral strategies namely:

- i. strengthening the institutional framework and policy development
- ii. research, technology delivery and capacity building;
- iii. production and Dissemination of Rice Seed;
- iv. fertilizer marketing and distribution;
- v. irrigation and investment in water control technologies;
- vi. Equipment Access and Maintenance Strategy;
- vii. Post-harvest and marketing; and,
- viii. Finance and credit

IMPLEMENTATION STRATEGY

23. The NRDS will be implemented by the Ministry of Agriculture assisted by a National Rice Development Steering Committee (NRDSC) through the collaborative efforts of the NARI, DAS and the CPCU at national level. At the regional level, it will be implemented by the RAD assisted by RRDSC.

24. The national level governance structure will include:

1. The Ministry of Agriculture (MOA) and its technical arms of:
 - National Agricultural Research Institute (NARI);
 - Department of Agriculture; and,
 - Central Projects Coordination Unit (CPCU)
2. The National Rice Development Steering Committee will assist the MOA in its programme planning, evaluation and review functions and will comprise of twelve key stakeholders.

25. The regional level governance structure will include:

1. The Regional Agricultural Directorate (RAD); and,
2. A Regional Rice Development Steering Committee (RRDSC) in each of the six agricultural field administrative regions will assist their respective RADs in their

annual rice programming, evaluation and review functions and will comprise of ten key stakeholders:

26. NARI will assume responsibility for strengthening partnership assisted by NRDSC. The CPCU will promote Project-based collaboration and effective partnership among all stakeholders assisted by RRDSCs within their jurisdictions
27. The CPCU under the supervision of the MOA has ultimate responsibility for monitoring and evaluating the implementation of this Strategy at national and regional levels, based on the guidelines provided by the NRDSC and RRDSCs.
28. The government, WAAPP, *Nema*, FASDEP and GCAVMP will fund most of the interventions. Intensive activities like irrigation schemes will be additionally funded through cost sharing mechanisms with beneficiaries (small-scale farmers, private investors), donor assisted irrigation schemes; and public funded irrigation schemes.
29. Based on the lessons learnt from previous rice R&D experiences in sub-section 3.2.6, strategy scope/targets in sub-section 5.4.1 and the proposed irrigation and water control investment strategy for the NRDS in sub-section 6.2.5, a plausible indicative planning figure is estimated at about US\$865.25 million over the 10-year period.
30. The due attention given by the government to the rice sub-sector confirms the huge potential of sustainability of promoting the sub-sector. This reinforced by the established partnership among countries. CARD Secretariat and the Network among research institutions.

CONCLUSION

31. Through improved cultivated area expansion and intensification to increase production and productivity, rice production will be greatly enhanced and total milled rice output more than quadrupled during the Strategy period 2015/2024.
32. The envisaged development and expansion would enhance sustainable increase in rice production and productivity which will not only achieve the NRDS aim of doubling rice production but also its underpinning vision of “*self-sufficiency in rice production*” by the year 2024.

1. INTRODUCTION AND BACKGROUND

1.1 Introduction

The Republic of The Gambia is located in the valley of the Gambia River on the west coast of Africa stretching as a narrow band of land, approximately some 480 km long and varying in width from 48 km in the estuary of the river to 24 km inland, on both sides of the River, which bisects it. It lies between latitudes 13⁰ 3' and 13⁰ 49' N and longitude 16⁰ 48' and 13⁰ 47' W, and, except on the Atlantic coast, the country is bordered by the Republic of Senegal on all sides. It is situated in the south of the Sahel in a region which is largely semi-arid with only one rainy season of mean annual precipitation of 750 to 900mm and a long dry period of 7-9 months.

The topography consists of riverine flats and swamps intersected by tidal creeks of water courses which lead up to gently rolling slopes ending at a plateau. The upland vegetation of most the country is savannah woodland with shrub and grass understoreys. The mangrove swamps are among the least changed features. The soils are mostly ferralitic and ferruginous weathered tropical soils characterized by low cation exchange capacity; low inherent fertility; strong consistencies and poorly developed structures; and, medium to high base saturation. They include: the freely draining upland soils which occur along the plateau and its foot-slopes; the poorly drained hydromorphic lowland soils located along the banks of the river and its tributaries; and, the transitional colluvial – alluvial soils formed by colluvial and alluvial processes that occur in position between the uplands and the lowlands.

Water resources comprise of ground water and surface water. Exploitation of the water resources for agricultural production is minimal. Use of ground water for agricultural production is mainly in horticulture whereas use of surface water is in rice production principally in the Central River Region (CRR) where the river is perennially fresh.

Evident from the foregoing analysis of the geographic, climatic and topographic circumstances of the country and its natural resource endowment, The Gambia possesses a good range of suitable ecologies for rice production. Thus, The Gambia is one of the 11 Second Group (G2) countries of the Coalition for African Rice Development (CARD) initiative launched following the Fourth Tokyo International Conference on Africa Development (TICAD IV) in May, 2008. The initiative aims at doubling the rice production in Africa by the year 2018. Pursuant to the implementation of its commitment as a party to the initiative, The Gambia started to formulate its National Rice Development Strategy (NRDS), after the Third General Meeting of CARD held in Arusha, Tanzania, in May 2010. Thus, taking into consideration the comparative production capacities of the major rice growing ecologies (rain fed upland, rain fed lowland, mangrove

swamp and irrigated) of the country, this document outlines The Gambia's NRDS which proposes to double its rice production by 2018.

1.2 Background

1.2.1 The Global Rice Sector

Rice is a dietary staple for at least 62.8% of the inhabitants on the planet and accounts for 20% of the caloric intake for the world population. In Asia it accounts for 29.3% (Timmer 2010).

Both paddy production and milled rice trade are carried out throughout several countries in the world. Table 1.1 presents the global paddy rice production and international trade in milled rice in terms of averages for the period 2009/2011 and absolute figures for 2012 and estimates and forecasts for 2013 and 2014 respectively.

Table 1.1: World Production of and Trade in Rice for Period 2009/2011 - 2014 in Million Tonnes

Item/Activity		Year			
		2009/2011 Average	2012	2013 (Estimate)	2014 (Forecast)
Production (Paddy)		706.3	736.9	744.9	751.0
International Trade	Import	32.4	38.4	37.3	39.3
	Export	32.4	38.4	37.3	39.3

Source: FAO, 2014

Worldwide paddy rice production averaged about 706.3 million tonnes during the period 2009/2011 and grew by about 4% to 736.9 million tonnes in 2012. Estimate of paddy rice production for 2013 is put at 744.9 million tonnes which predicts a 1% increase over 2012. The FAO forecast for 2014 production is put at 751.0 million tonnes of paddy, representing a 0.8% improvement on the 2013 record harvest, which suggests a continuation of the increasing trend though at a sluggish rate.

International trade in milled rice averaged about 32.4 million tonnes during the period 2009/2011 and grew by about 19% to 38.4 million tonnes in 2012. Estimate of milled rice trade (both import & export) for 2013 is put at 37.3 million tonnes representing a 3% decline over 2012. The FAO forecast for 2014 milled rice trade is put at 39.3 million tonnes representing a 2% increase in the 2012 record export/import, predicting an increasing trend in international milled rice trade.

The foregoing analyses established an increasing trend in global rice production though sluggishly matched by an increasing trend in international coarse rice trade. The sum total implication of these for net coarse rice importers like The Gambia is an increasing international export/import price, which would have adverse effect on the deepening state of poverty in these countries.

1.2.2 African Rice Sector

Rice is also becoming increasingly popular in Africa with about 16 million metric tonnes of annual consumption and 14 million tonnes of production, creating a deficit of 2 million metric tonnes met by imports. The total value of rice imports by West African countries alone is estimated at US\$1.4 billion per year (Somado *et al.*, 2008).

Africa is endowed with all the five ecologies suitable for rice production and it is estimated that over 75% of African countries with a total population of 800 million people cultivate rice. Table 1.2 presents the Africa's shares in global paddy rice production and international trade in milled rice in terms of averages for the period 2009/011 and absolute figures for 2012 and estimates and forecasts for 2013 and 2014 respectively.

Table 1.2: African Production of and Trade in Rice for the Period 2009/2011 - 2014 in Million Tonnes

Item/Activity		Year			
		2009/2011 Average	2012	2013 (Estimate)	2014 (Forecast)
Production		25.3	26.9	27.0	27.7
International Trade	Import	10.4	13.6	13.5	13.8
	Export	0.5	0.5	0.5	0.6

Source: FAO, 2014

Africa's share in the worldwide paddy rice production averaged about 25.3 million tonnes during the period 2009/2011 and increased by about 6% in 2012. Estimate of paddy rice production for 2013 is put at 27.0 million tonnes which predicts a 0.4% increase over 2012. The FAO forecast for 2014 production is put at 27.7 million tonnes of paddy, representing about 3% improvement on the 2012 harvest, suggesting an increasing trend.

Africa's share in international coarse rice imports averaged about 10.4 million tonnes during the period 2009/2011 and increased significantly by about 31% in 2012. Estimate of Africa's share in the global coarse rice imports for 2013 is put at 27.0 million tonnes representing an insignificant decline of about 1% over 2012. The FAO forecast for 2014 Africa's milled rice trade is put at 13.8 million tonnes representing about 1% increase in the 2012 import share, predicting

an increasing trend though sluggishly. Africa's in the international export trade averaged about 0.5 million tonnes during the 2009/2011 period which stagnated in 2012. The 2013 share is estimated to remain stagnant at the 2012 0.5 million tonnes. Although the FAO forecast for 2014 predicts a 20% heaving up in the 2012 share to about 0.6 million tonnes in 2014, the trend in Africa's share of world export of coarse rice can be aptly described as a stagnant one.

Thus the foregoing analyses established an increasing trend in Africa's share in global coarse rice imports. This increasing trend in the continent's import share is matched by a fairly increasing trend in its share of global paddy rice production but a stagnant trend in its share of international coarse rice export. The sum total implication of this conclusion for African rice producers-cum-consumers like The Gambia is one of an urgent need to accelerate the exploitation of their rice production potentials to check worsening food insecurity.

1.2.3 The Gambia Rice Sector

Rice is the staple food with a per caput consumption of 117kg per annum, some 106% above the world average of 56.9kg. The annual requirement stands at about 199,000 MT of which only 17% is produced locally. The deficit has to be imported. There is a long history of rice importation into The Gambia.

The dependency on imports to meet the national rice deficit predisposes the food security situation in The Gambia to the vulnerability of volatile global market trends. With the current world market price for broken rice at \$300 per MT, around \$50 million was spent in 2011 for importation of rice into The Gambia to meet the deficit. Rice prices are bound to remain high as the market demand for rice increases, and as other crops, e.g. maize, millet and cassava compete for land with bio-fuel crops.

Decline in national rice production has significantly increased the dependency of rural population on imported rice, thus reducing their savings and net income. Income generated from other farming and off-season farm activities are inevitably used to procure imported rice.

Renewed efforts to resuscitate rice production include the recently terminated four-year Upland Rice Expansion Project by the Taiwanese Mission and the introduction of suitable rice varieties by the National Agricultural Research Institute (NARI) under its NERICA Project supported by the Africa Rice Initiative (ARI) of Africa Rice Centre. The potentials for expanded rice production to make a visible progress towards the "Executive Vision" of rice self-sufficiency by the year 2016 are ample.

Improved rice production and productivity will have positive rural income-effect and scarce foreign exchange saving-effect. All of these will have positive impact on overall national socioeconomic growth and the ultimate goal of the Government to utilize innovative measures to effect a shift from the subsistence rice production system of today, to a vibrant commercially-oriented production system with an enhanced value addition chain which will be difficult to attain without a concerted National Rice Development Strategy and an operational National Rice Policy in place.

2. REVIEW OF THE NATIONAL RICE SECTOR

2.1 The Evolutionary Perspective

In The Gambia, like many other African countries, the structural adjustment and economic recovery programmes of the mid-1980s that introduced trade liberalization and removal of subsidies on farm inputs and guaranteed prices made local agro-production very expensive for the farmers and consumers alike, even before WTO agreements on agriculture were implemented.

Systematic attempts to exploit the rice development potentials of the country commenced with the ill-fated Colonial Development Corporation's Rice Farm Scheme of 1951. By the end of the subsequent decade, the government adopted and pursued a policy of rice self-sufficiency through the implementation of two projects. A Taiwanese-Gambian Technical Assistance Agreement, which initiated systematic small-pump irrigated rice development, was commissioned in the two distal divisions of the country in 1966. An International Bank for Reconstruction and Development – International Development Agency (IBRD-IDA)-supported project was commissioned in 1973 to expand the experience of the former within the same divisions. The Technical Assistance Agreement was terminated in 1974 and the IBRD-IDA project was closed in 1976 by which date the two initiatives developed a total of 1607 ha. under small-pump irrigated rice production.

The cumulative effect of worsening terms of trade and over-extension of government's development and recurrent budgets to stimulate accelerated growth during the 1975/85 decade led to a rapid drawing down of foreign exchange reserves and increasingly severe budgetary and balance-of-payment strains. Thus, despite the variety of public investment measures especially in irrigated rice development under-taken to promote increased production, these antecedent series of economic disruptions did not only undermine the national strive towards a perverse policy of self-sufficiency in rice production but also triggered an unprecedented rate of import of rice into the country. This occasioned a secular trend in the substitution of rice and to a lesser extent wheat, in place of traditional food crops of millet, sorghum and maize and started to play an important role as the most preferred staple diet.

The Economic Recovery Programme (ERP) achieved substantial stability of the economy by 1990. Between 1985 and 2005 the government commissioned five important rice development projects as part of its ERP stabilization activities and sequential consolidation of its gains. Those projects amounted to a total of US\$ 44.369 million excluding the then on-going rice development activities under the terminated Taiwanese-Gambian Technical Assistance

Agreement of 1996. The foregoing investment in rice production notwithstanding, domestic milled rice production during the 1980/2005 period declined from an all-time high of 26,474 tonnes in 1980/81 to a near all-time low of 13,082 tonnes in 2004/05. Correspondingly milled rice imports soared from 33,680 tonnes in 1980/81 to 73,825 tonnes in 2004/05. Thus, the country is seriously deficient in meeting its national requirements of rice.

Figures 2.1, 2.2 and 2.3 present respectively the relative cultivated areas, production and yields of upland and lowland ecologies during the 2006/2013 period. In spite of the long history of policy commitment to rice self-sufficiency total area under rice and production declined over the last seven years.

Figure 2.1 Upland/Lowland cultivated areas (ha.) **Figure 2.2 Upland/Lowland Productions (MT)**

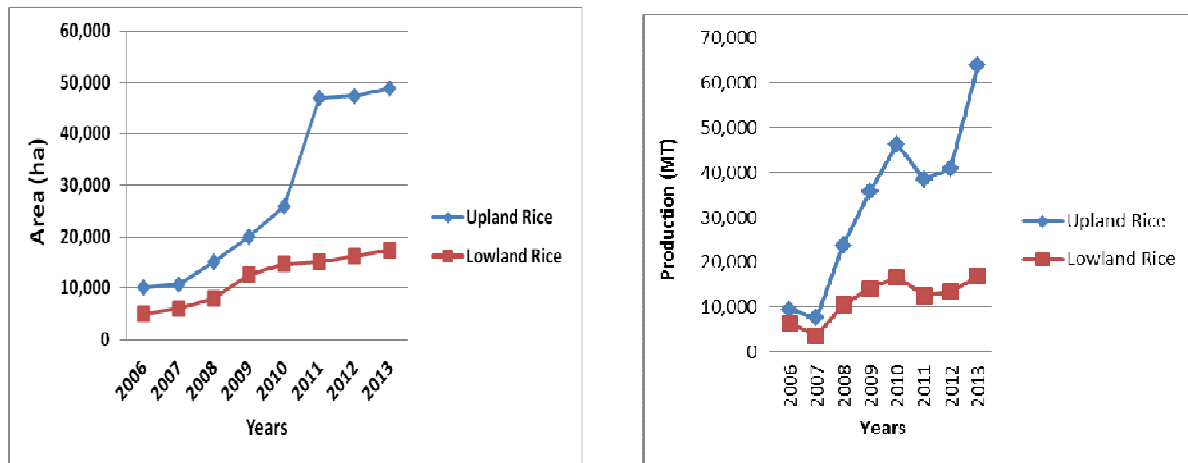
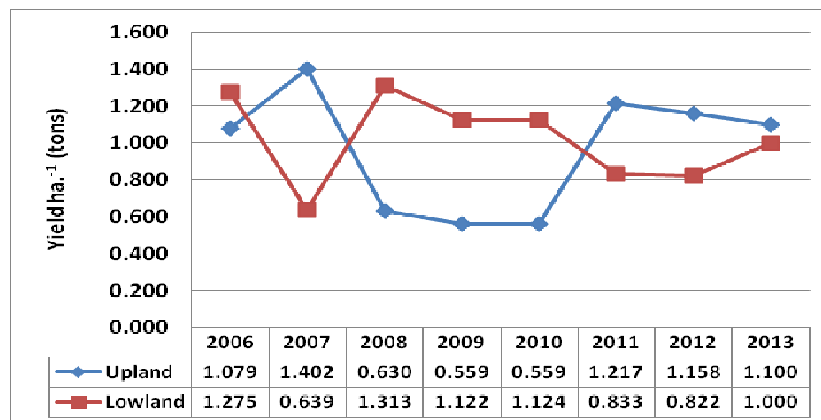


Figure 2.3 Relative Upland/Lowland Yields/ha



As depicted in Figure 2.1, the area under upland rice soared from 10,000 ha in 2006 to a peak of 47,500 in 2011 and rose further to 50,000 ha in 2013. Contrariwise, the area under lowland sluggishly grew from 5,000 ha in 2006 to just about 17,500 ha in 2013. As evident from Figure 2.2 the corresponding upland paddy rice production soared from 10,000 tonnes in 2006 to a peak of about 45,000 tonnes in 2010, slumped slightly to just about 38,000 tonnes in 2011 and rose up to 65,000 tonnes in 2013. The paddy rice production under lowland grew erratically from just about 5,000 tonnes in 2006 to a peak of about 17,500 tonnes in 2010 dipped down to 12,500 tonnes in 2010 and heaved up to about 18,000 tonnes in 2013. The corresponding yield per hectare behaved rather erratically. Upland yield rose from about 1,100 tonnes in 2006 to 1,400 in 2007, dropped down to about 630 in 2008 and erratically rose up to about 1,200 in 2011 and declined to 1,100 tonnes in 2013. Lowland yield per hectare dropped down from about 1,300 tonnes in 2006 to 600 tonnes in 2007, rose up to just about 1,300 again in 2008 and erratically declined to 1,000 tonnes in 2013. Thus the production of rice has been trailing, on average, at 15-20% of total national requirements

Concerted efforts to reduce the domestic production/demand gap took the form of an upland rice expansion program with the aim of cultivating 8000 ha per year for 4 years which is expected to produce up to 32,000 metric tons of paddy rice.

2.2 Status of Rice in National Policies

Albeit cautions the government's immediate post-independence rice policy was tacitly self-sufficiency despite the failure of the colonial experience in rice production. However, with persistent drought conditions during the early-70s, rapidly growing rural population, diminishing potentials of the traditional food production technologies with consequent widening of seasonal food deficits, the government espoused an explicit policy of rice self-sufficiency through irrigated rice production by mid-1970.

The current Agriculture and Natural Resources (ANR) policy upholds this self-sufficiency policy stance in food production in a bid to transform agriculture into a sustainable, modernized, diversified export oriented sector, one that will contribute to improve food and nutrition security, farmers' livelihood and overall economic growth with particular emphasis on production of rice. Thus while the national Poverty Reduction Strategy Paper 2007 – 2011 (PRSP II) identified rice as the major crop for food security, its successor Programme for Accelerated Growth and Employment (PAGE, 2011 – 2015) defines a host of strategic actions to tackle the institutional, structural and farm input challenges in achieving food security and becoming food self-sufficient.

Although the long history of rice policy commitment to self-sufficiency appears to be making negligible impact on the rice self-sufficiency ratio, the National Agricultural Sample Survey (NASS) figures show that significant increases in both the total area under cultivation and total paddy production during the 2001/02 – 2010/11 decade have been realized. Total cultivated area under rice increased by an average annual rate of 37% from 18,200 ha in 2001/02 to 86,150 ha in 2010/11 and corresponding paddy production increased by an average annual rate of about 21% from 32,600 tonnes to 99,890 tonnes.

The increase in cultivated area is derived from expansion in upland rice cultivation engendered by the introduction of NERICA rice varieties. However, the lowland ecologies have greater potential for rice production although their cultivation is constrained by low and poor rainfall distribution and poor water management and control structures. Thus PRSP II recommended that future investment efforts be focused on irrigated rice cultivation to increase overall domestic production. The current ANR policy orchestrates that recommendation by emphasizing infrastructural development, modernization, private sector inclusion and enhancing value addition.

The Gambia is a signatory to the Comprehensive Africa Agricultural Development Programme (CAADP). As part of its commitment under the Programme the government has agreed to increase public service investment in agriculture by a minimum of 10 percent of the National budget with the view to increasing productivity by at least 6 percent in order to eradicate hunger and reduce poverty through agriculture. This commitment is reflected in a series of policy implementation actions such as the five main focal areas of the Gambia National Agricultural Investment Programme (GNAIP) and the commissioning of the West African Agricultural Productivity Programme (WAAPP), *Nema*, Food and Agriculture Systems Development Project (FASDEP) and Gambia Commercial Agriculture and Value Chain Management Project (GCAVMP). Thus, pursuit of its rice self-sufficiency policy will be a prime candidate in these initiatives. The most recent rice specific time-bound policy action is the pronouncement of a Vision of rice self-sufficiency by the year 2016 by His Excellency the President.

2.3 Consumer preferences and demand projections

Prior to the 1970s, the market for imported rice was restricted mainly to the urban areas. Before this time, local production met the rural requirement. However, this equilibrium was disrupted by the recurrent severe Sahelian droughts of the 1980s which significantly affected the lowlands, causing salinization of lowland rice ecologies and crop failure. This resulted in drastic decline in local rice production putting significant demand on imported rice.

Consumer preference in the rice market is dictated by quality of the milling process and the type of dish to be prepared. Urban rice consumers generally prefer polished rice. The degree of polish is a key difference between imported and locally produced rice which in most cases is manually milled or not adequately polished. The urban consumers also prefer broken rice which is more suitable for the favourite urban dishes. These dispositions of the urban consumers favour the importers since 100% broken rice is cheaper than whole grain rice in the international market. However, the people recognize the excellent dietary properties of locally produced rice.

In 2010 a total of 63 000 metric tonnes of polished rice, equivalent to 60% of the total national rice requirement, was imported. However, consumers in the rural areas would go for locally milled rice due to its freshness, taste and appropriateness for local cuisines.

Figure 2.4 The National Demand for Rice and Projected Values to 2024

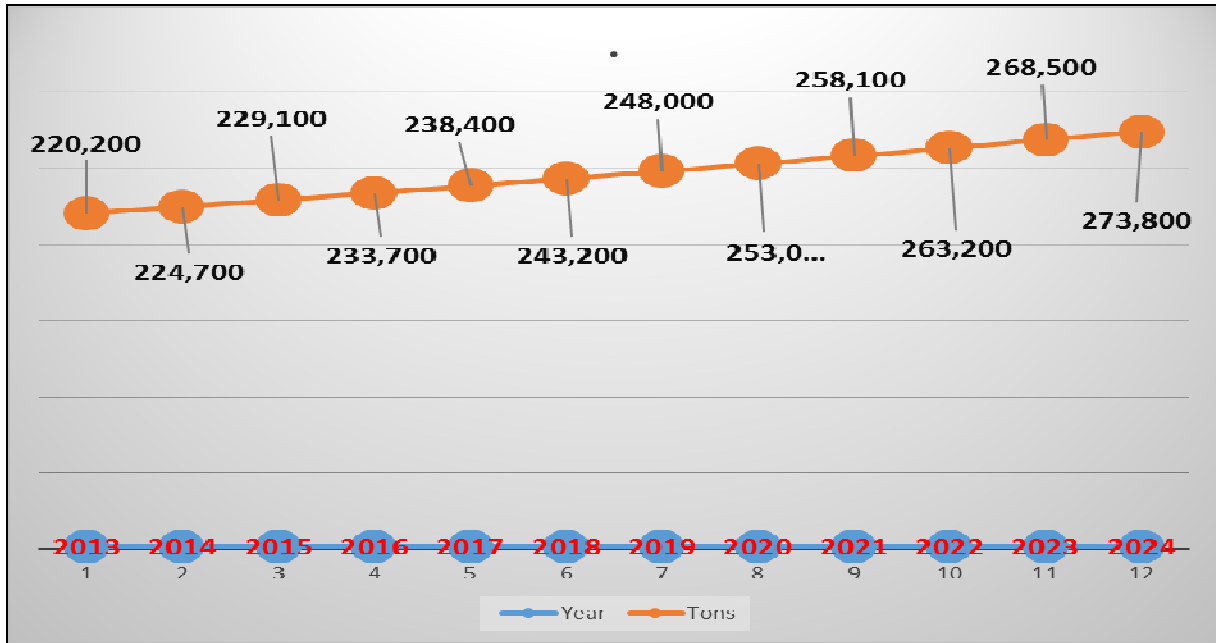


Figure 2.4 presents the national rice demand in metric tonnes projected to 2024. Based on a provisional population figure of 1,882,450 (2013 census) and per capita rice consumption of 117kg per annum, the national demand for rice in 2013 is estimated at 224,700 tonnes. Projecting this estimated demand by the provisional population growth rate of 2% to 2024 gives a projected demand of 273,800 tonnes of milled rice.

2.4 Typology and number of rice farmers, processors and traders

In view of the social and economic importance of rice as the staple food of the country a wide range of typology of actors are involved at every stage of the value chain as direct or secondary and/or intermediate actors. This situation is further complicated by the fact the country's demand for rice is partly met through commercial imports and partly by local production with strong gender bias in the two main rice production systems.

2.4.1 Typology and Number of Rice Farmers

Rain-fed rice in The Gambia is mainly grown by small resource-poor women farmers on small farms measuring between 0.25 and 0.5 ha on average whereas water-controlled irrigated rice production, especially pumped irrigated type, is mainly undertaken by men farmers. Thus, based on gender bias in the two rice production systems, there are two categories of rice farmers: women and men.

The women's rice produce is primarily for home consumption as part of their contribution to the family food needs while small quantities are sold locally to meet their occasional cash needs.

Most of the land in the irrigated rice projects are owned or controlled by men either as commercial rice farmers or head of participating family units. Tenant irrigated rice farmers of both men and women exist in this system. The greater part of the produce of commercial rice farmers is sold for cash. Both classes of farmers would normally use part of their produce, sold or in-kind, to pay off project input loans and/or rent. There is also an emerging trend of commercialization in rain-fed upland rice farming mainly in West Coast Region and Upper River Region with the introduction of upland NERICA rice varieties. Thus on the basis of scale of operation two typologies of rice farmers exist: small-scale and large-scale rice farmers. Similarly on the basis of use of produce two typologies of rice farmers exist: subsistence and commercial.

There has been an upsurge in the number of rice growers acting singly or in groups since the introduction of NERICA rice in 2001/2002. Some of the notable rice farmer groups are “NAFA” NERICA Farmers’ Association of URR Basse, Jahal Rice Farmers’ Cooperative Society and Souhali Rice Growers Association. Reports of the Planning Services indicate that rice farmers grew by an average annual rate of 144% from 53,302 farmers in 2006 to 284,268 in 2009. This unprecedented rate of increase is largely due to the upland rice expansion programme.

2.4.2 Number of Processors (millers):

Since the sector is not well developed, there are very few modern processors with threshing and milling facilities. However, current projects are making effort to mechanize the processing aspect of the rice value chain. The NERICA project has bought some threshing and milling machines which were given to the NERICA Farmers’ Associations in different agricultural regions. At least one milling machine and one thresher were given to each of six NERICA focal villages throughout the country. This is most inadequate considering the number of rice producers. Due to inadequate mechanization 30% of paddy produced is being lost during processing (WFP, 2010).

Bottlenecks in rice processing capacities seem to be one of the major obstacles to an increased commercialization of rice. Currently the bulk of the rice produced is milled by women on the farm using traditional methods leading to low milling ratios of whole rice. The Association mills, which are largely underutilized due to high milling charges of about 0.5% in-kind, report a milling percentage of 60%. Thus access to efficient milling services seems to be a critical factor for increasing marketable quantities and quality of local rice.

2.4.3 Number of Rice traders:

The paddy and milled rice traders (wholesalers and retailers) are scattered all over the country. The marketing of rice is mainly carried out by private dealers although farmers also mill part of their rice for sale directly to consumers or traders. A good number of traders sell milled rice at village markets and/or “lumos”. In the past, traders used to come from across the border (Senegal) to procure paddy and milled rice at lower prices to resell in their country. In spite of the fact that local rice commands a premium price in the Greater Banjul Area above that of imported rice, the general feeling among traders is that it is more profitable to sell across the border in Senegal than on the local market. Nonetheless, limited quantities of local rice in excess of household needs are also sold to traders or farmers from neighboring villages. Milled rice is sold in two forms either in 50kg bag or by cup (a tin of about 230 grams).

2.5 Gender dimensions in the Rice Value Chain

In the Gambia, women are almost exclusively responsible for rain-fed and tidal swamp rice and provide labour on male-controlled irrigated rice (some women also have personal irrigated rice fields). Men cultivate upland coarse grain crops (maize, sorghum and millet) as well as groundnut, cotton and irrigated rice. On farm traditional milling of rice is exclusively done by women. Both women and men are involved in the commercial milling of rice in groups or individually. Similarly both men and women are involved in marketing of rice but mainly individually. Within this blurred division of gender responsibility in the overall rice value chain, there is clear distinction in the gender management responsibilities in field level production.

Table 2.1 presents the relative gender management responsibilities for the rain-fed rice enterprise in terms of number of fields and hectareage under cultivation. Over 77% of upland rice fields and 87% of cultivated areas are owned by women. Similarly about 89% of fields and 54% of total area cultivated under swamp rice are owned and managed by women. The lower percentage of swamp rice fields owned by women is reflective of the fact that irrigated rice which is mostly owned by men is also included in the swamp rice hectareage. Thus the bulk of rain-fed rice which is the main source of the country's rice production is mainly owned and managed by women despite increasing entry of commercial male farmers in upland rice production precipitated by the NERICA project.

Table 2.1: Management Responsibility of Rain-fed Rice Fields by sex of Manager in 2007

Crop	Field Manager/sex				Area Planted/Ha/sex			
	Male	Female	Total	% of female	Male	Female	Total	% of female
Upland Rice	7,613	26,882	34,495	77.93	1,319	9,403	10,722	87.69
Swamp Rice	5,069	42,751	47,820	89.39	2,691	3,175	5,866	54.12

Source: NASS, 2008 Report.

Currently, women represent over 45% of the total agricultural labour force and 95 % of the work force in rice production. In recognition of the vital role of women in the socio-economic development process, the government has taken some measures to correct the disadvantaged situation of women especially in access to agricultural land.

2.6 Comparative advantage of domestic rice production

Domestic rice in The Gambia has a number of comparative advantages. These include both technical and socioeconomic factors of which the following are key ones:

- i. the existence of research support with good linkage to international research institutes like the International Rice Research Institute (IRRI) and Africa Rice Centre, and the Japanese International Research Centre for Agricultural Science (JIRCAS), which have adapted and released suitable rice varieties with required agronomic and food qualities;
- ii. the existence of huge production potentials both under rain-fed and irrigation conditions;
- iii. domestically produced rice is of acceptable types and fulfills quality requirements of the domestic as well as the international markets;
- iv. the existence of huge competitiveness mainly because of the existing cheap labour, which can improve the competitiveness of The Gambian rice in the international markets and the existing huge post-harvest loss (about 50%), which can be improved by using cost effective production technologies and installation of milling and processing facilities close to the production areas;
- v. the existence of considerably high domestic demand which is currently being met through imports of lower quality rice ; and,
- vi. possibility of linking to other microenterprises in the value addition and also petty trade

3. CHALLENGES & OPPORTUNITIES FACING NATIONAL RICE SECTOR DEVELOPMENT

3.1 Challenges

The development of the rice sector in The Gambia is faced with a myriad of challenges as confirmed by Focus Group Discussions with a wide range of rice farmers across the country (Annex Tables 1 & 2). Salient among these challenges are the following:

3.1.1 Input Related Challenges

There are six major input-related constraints in rice production. These constraints are presented in Table 3.1 in a prioritized rank order. In a descending order of priority ranking from 1 to 6, these input related constraints are: access to and use of post-harvest equipment; access to and use of land preparation equipment; access to and use of chemical fertilizer; access to improved varieties; access to and use of pesticides; and, labour shortage during peak farm operation.

Table 3.1 Priority Ranking of the Major Input Constraints

Constraint	Rank Order
Access to and use of post-harvest equipment	1
Access to and use of land preparation equipment	2
Access to and use of chemical fertilizer	3
Access to improved varieties	4
Access to and use of pesticides	5
Labor shortage during pick farm operation	6

3.1.2 Agronomy Related Challenges

Table 3.2 presents prioritized ranking of major agronomic constraints. The priority ranking of these constraints in descending order of importance is poor land preparation techniques; method and date of planting; weed and weed control method; and, type, rate and date of fertilizer.

Table 3.2 Priority Ranking of the Major Agronomical Constraints

Constraint	Rank Order
Poor land preparation technique	1
Method and date of planting	2
Weed and weed control method	3
Type, rate and timing of fertilizer application	4

3.1.3 Irrigation and Water Management Related Challenges

In spite of the good water resource potential for rice production in The Gambia, there are challenges in irrigated rice development which include:

- i. low level of attention for rehabilitation of existing irrigation schemes and resulting insufficient water retention due to siltation;
- ii. shortage of improved irrigated rice varieties;
- iii. salinity and drainage problems; limited skilled human resources in the field of irrigation techniques and irrigation water management;
- iv. lack of strong and clear guidelines for cooperation and integration of efforts among different disciplines and institutions in considering rice as irrigated crop in most existing irrigation schemes;
- v. low irrigation efficiencies (storage and conveyance, etc) and the high cost of pump irrigation. Repair and maintenance and fuel are serious constraints to expansion of irrigated rice production; and,
- vi. social and environmental constraints: some of the negative social and environmental impacts of irrigation could cause conflict among users due to over extraction of water and inefficient use by irrigation schemes, prevalence of water borne diseases such as malaria and others and, increased salinity.

Table 3.3 presents the major constraints arising from irrigation and water management related challenges in promoting irrigated rice production in a prioritized rank order. In descending order of priority ranking, these are lack of improved irrigated rice varieties; poor extension service; limited emphasis on rehabilitation; limited expansion and construction of new irrigation schemes; limited human resource capacity especially irrigation agronomists and technicians; and, salinity and drainage problems.

Table 3.3 Priority Ranking Major of Constraints in Irrigation and Water Management

Constraints	Rank Order
Lack of improved irrigated rice varieties	1
Poor extension service	2
Limited emphasis on rehabilitation of existing irrigation schemes	3
Limited expansion and construction of new irrigation schemes	4
Limited human resource capacity (esp. irrigation agronomist and technician)	5
Salinity and drainage problems	6

3.1.4 Pre-and Post-harvest Mechanization Technology Challenges

Appropriate soil tillage machinery/equipment is desired in the conditions of the different agro-ecological zones (AEZs). Suitable and adequate power supply for different farm operations; presence of equipment leasing and maintenance service providers; and, availability of adequate supply of spare parts are important requirements for successful farm operations to increase rice production and to remove drudgery in farm operations.

3.1.5 Land Tenure and Other Social Constraints in Rice Production

Almost all farm lands in rural Gambia are held under customary tenure system. Under this system three forms of land ownership coexist in a village community. These are community owned land under the control of the village headman (Alkalo), family owned land controlled by family heads and individually owned land. Inheritance and/or control of land under customary tenure system tend to be patrilineal reinforced by prevalence of a system of marriage in which the wives go to leave with their husbands. .

There are three main channels through which a woman obtains land under customary tenure system: (i) through her husband; (ii) through her paternal compound as a gift on marriage; and (iii) through borrowing/renting/purchasing. Thus under this system access to rice land by women poses no problem.

However, the rice fields in the lowland are small individual parcels of mostly less than 0.5 ha and enclosed by bunds to establish boundaries and facilitate water retention. The small size and structural configuration of the individual fields limit the degree of mechanization possible in these fields. These structural constraints are reinforced by the physical nature of the underlying soils of these ecologies. This situation is further accentuated by such social factors as gender inequalities which prevent many women from accessing adequate land and other essential production inputs such as farm machineries and agricultural credit even though studies have shown that women are more credit worthy.

3.1.6 General Constraints in Rice Production

A number of important general constraints of either socioeconomic or technological in nature exist. These include:

- i. Yearly uncertain availability of high yielding certified quality seeds and planting materials;
- ii. Low access to available credit; inadequate use and management of financial services;
- iii. Unreliable weather conditions, long periods of drought and heavy dependence on rain fed production;
- iv. Limited control of land resources by small producers, especially women who constitute a significant percentage of producers of staple food crops;
- v. Relatively unavailable and unaffordable water control technologies by small producers; costs of irrigation facilities are high, threaten to reduce margins and create disincentives to investment;
- vi. Low capacities to afford improved technologies, pest control, agro-chemicals and post-harvest handling (storage and agro-processing);
- vii. Predominantly low output manual farm power and inadequate use of mechanical power due to both lack of mechanical services and/or small size of farm holdings;
- viii. Low level of research support to crops particularly in reducing costs of domestic production and raising quality which would increase their competitiveness with cheap imports;
- ix. Declining soil fertility and soil erosion, particularly for the uplands, resulting from unsustainable land use practices; salt water progression upstream of the river, particularly during the dry season; and,

- x. The markets are relatively inefficient with negligible infrastructure and inadequate information dissemination

3.2 Opportunities

A wide range of opportunities for efficient local production of rice exist in The Gambia. These stem from climatic circumstances and natural resource endowment of the country right through to the geopolitical location of the country and policy environment and include:

3.2.1 Production Potentials for Rain-fed and Irrigated Agriculture

Some 56% of the country's land area or 555,240 ha, are considered suitable for agriculture and are utilized for upland cereal and groundnut production as well as for grazing and fallow. This total arable land area comprises of 339,119 ha of upland and 216,121 ha of lowland ecologies. Of the 216,121 ha of lowland area, 81,120 is considered suitable for irrigation.

Out of the total arable land area, about 407,484 ha (about 73%) was cropped in 2013 of which 68,712 ha was under rice, comprising of 48,946 ha upland, 17,434 ha lowland and 2332 ha irrigated. There is therefore, an unexploited lowland potential of 196,355 ha for rice production. Similarly, of the 339,119 ha arable upland area 338,772 ha was under cultivation in 2013 and there was an unexploited potential upland area of only 347 ha. Thus, even discounting for possible land use substitution-effect in response to changes in the relative profitability of the crop mix in favour of rice, the land resource potentials for rice production especially lowland rice is huge. Therefore, although 2016 is too brief a planning horizon for a vision of rice self-sufficiency, the land resource potentials exist for a longer term goal of self-sufficiency in rice production.

3.2.2 Potential of Local Rice in Rural Poverty Reduction and Economic Growth

As the staple food of the population, rice has become an increasingly important cash crop, especially for women rice farmers, in view of its insatiable demand and relatively volatile price trends in the national food market. The following are some of the existing potentials of rice production in the country:

- i. Agro-ecologically, the crop can grow in both rain-fed (upland and lowland) and irrigated agro-ecosystems of the lowland and intermediate areas creating an opportunity for poverty reduction in all areas with these target ecologies;
- ii. The number of rice producers, processors, and traders is increasing thus creating addition income generating activities and livelihood options for many actors. This has direct implication for rural poverty reduction ;
- iii. It is relatively less susceptible to stored pests than other cereal grains such as maize, sorghum, and millet, which are commonly used in food security measures;
- iv. In recognition of its comparative advantages over other food crops, The Gambia has selected rice as one of the top priority crops and dubbed it as a "Millennium Crop" of prime importance for food security and income generation; and,
- v. Local rice production has a huge potential of being a foreign exchange saver as an import substitution crop as well as foreign exchange earner as an export crop.

3.2.3 Potential Supply Sources of High Yielding and Adaptable Varieties

Currently, there is a smooth exchange of rice germplasm within the region. This exchange process is effectively managed and administered in the West Africa sub-region by the West Africa Rice Development Association (WARDA, now renamed the Africa Rice Center – Africa Rice). Internationally it is facilitated by the International Rice Research Institute (IRRI). An ECOWAS initiative plans to establish a free movement of goods and services across countries in the West African sub-region which has the potential of improving exchange and movement of research findings and seed varieties in particular.

Thus, the recently established AfricRice's Rice Sector Development Hubs mechanism constitutes a viable avenue for sourcing new technologies including high yielding and adaptable rice varieties through the foregoing processes and regional integration efforts

3.2.4 Availability of Technology Dissemination Channels

The history of rice production is as old as settled agriculture in The Gambia. Concerted research efforts in rice varietal screening and selection for both yield and adaptability to the rain-fed ecologies and agronomic practices and, subsequent dissemination of results commenced in the early-1950s in Jenoi. Over the years, these efforts and experiences were consolidated within the national Food & Cash Crop research sector and extension programme by the various rice development projects implemented since 1966 to become established research and extension programmes administered by specialized units and/or agents. Thus the public technology dissemination channels for all biological-based production especially rice production are well developed.

With the current regional configuration of the public agricultural development administration, with a Directorate of Agriculture, rice technology dissemination channels are evenly distributed nationally. In addition to the public extension channels for rice technology dissemination a number of NGOs conduct rice extension education as a major element of their programme or specialized rice development agency such as Freedom From Hunger Campaign (FFHC) with regional and/or ecological specificity.

3.2.5 Existence of Conducive Policy Environment

Consistent with its trade liberation, deregulation and investment promotion policy, The Gambia has a conducive national policy environment in which rice industry development has been accorded top priority in its drive for food security and poverty reduction which was recently renewed by the Chief Executive's assertion of "rice self-sufficiency by 2016".

This national rice development policy stance is further consolidated by the country's membership to some sub-regional, regional and global agricultural development programmes and agencies. These include:

- i. West African Agricultural Productivity Programme (WAAPP) supported by World Bank/Spanish Grant;
- ii. AfricaRice sponsored Rice Sector Development Hubs Mechanism;
- iii. Comprehensive African Agriculture Development Programme (CAADP) of African Union Members, May, 2002; and,
- iv. Food and Agricultural Organization (FAO) of the United Nations.

3.2.6 Favourable Trans-boundary/Regional Trade Environment

Currently, there is a lucrative re-export trade in rice from The Gambia to Guinea Bissau and Guinea Conakry of mainly imported rice. Similarly a fair amount of trans-boundary trade in locally produced rice through the weekly local Lumo Markets organized at various locations throughout the country which are heavily patronized by a large number of middlemen from all over the sub-region. These existing trans-boundary rice flows will be greatly consolidated and expanded by the ECOWAS initiative which plans to establish a free movement of goods and services across countries in the West African sub-region. It would further enhance exchange of market information and consolidate the existing linkages with traditional markets within the sub-region such as Senegal, Sierra Leone, Ghana, Mali, Guinea Bissau and Guinea Conakry.

In line with its trade liberalization, deregulation and investment promotion policy, The Gambia is a party to a number of sub-regional, regional and global trade agreements. These include:

- i. The Abuja Treaty under the Economic Community of West African States (ECOWAS), May, 1975 ;
- ii. Everything But Arms (EBA) of the European Union, March, 2001 ;
- iii. Cotonou Agreement of African, Caribbean and Pacific (ACP) Countries, April, 2003;
- iv. African Growth Opportunities Act (AGOA) of the United States, April, 2004;
- v. General Agreement on Trade and Tariffs (GATT) of United Nations Member States, February, 1965; and,
- vi. World Trade Organization (WTO) of United Nations Member States, October, 1996 and 2001.

Thus, The Gambian rice value-chain stakeholders have ample trans-boundary/regional market opportunities to access with good quality products that meet standards and consumer needs. The Gambia Investment and Export Promotion Agency (GIEPA) provides an institutional mechanism for strengthening and exploiting such trans-boundary/regional market access opportunities through international trade fairs and ensuring adequate national representation and negotiation capacity at WTO and major trading partners' fora.

3.2.7 Lessons Learnt from previous rice R&D

A number of valuable lessons have been learnt from previous rice development experiences since the early-1950s. The public rice development experiences stretched across all the lowland rice ecologies/farming systems in the country. These experiences include:

- i. the 1951/56 Rice Farm Scheme (RFS) for the large-scale irrigated and mechanized rice production in the Jahally/Pacharr swamps and mangrove clearing to reclaim tidal swamps for mechanized rice production supported by the Commonwealth Development Corporation (CDC) to develop 10,636 ha but established only 1,136 ha of rice at a total cost of £1.115 million (Commonwealth Survey, 1950) equivalent to about US\$1,568/ha;
- ii. the 1956/83 Tractor Ploughing Scheme for contract mechanical cultivation services in suitable rice growing ecological areas supported by Gambia Government;
- iii. the 1966/75 Taiwanese Technical Mission (TTM) for the development of small perimeter pump irrigated rice production;
- iv. the 1973/76 World Bank (WB) supported small perimeter pump irrigated rice production;
- v. the 1975/79 People's Republic of China (PRC) supported small perimeter pump irrigated rice production;
- vi. the 1981/2002 Jahally/Patcharr Smallholder Project (JPSP) for development of 1,454 ha under large pump irrigated, tidal irrigated and combination of pump and tidal irrigated rice production supported by ADB, IFAD, KfW, Netherland and WFP at a total cost of US\$16.99 million, equal to US\$11,700/ha ;
- vii. the 1990/96 Rice Development Project (RIDEP) for rehabilitation of 1,200 ha in 44 units of small perimeter pump irrigated areas of the TTM, WB and PRC initiatives supported by ADB, but only developed 352 ha at a total cost of US\$7 million, equal to about US\$19,900/ha;
- viii. the 1991/1997 Small-Scale Water Control Project (SSWCP) to establish 450 ha for purely tidal irrigation and gravity conveyance of irrigation water supported by IFAD at a total cost of US\$3.6 million, equal to about US\$8,000/ha;
- ix. the 1996/2012 Taiwanese Technical Agricultural Mission (TTAM) for the development of Tidal irrigated rice production;
- x. the 1998/2006 Lowland Agricultural Development Project (LADEP) supported by ADB to improve accessibility to swamps for increased rice production;
- xi. the 2003/2006 Irrigated Rice Development Project (IRRIDEP) planned to be supported by the Kuwaiti Fund to establish 1,200 ha at an estimated cost of US\$3 million equivalent to US\$2,500/ha total, aborted because the estimated cost of land development alone was some 177% more than the budgeted cost of the project; and,
- xii. the 2006/2013 Participatory Integrated Water-Shed Management Project (PIWAMP) to develop 49,751 ha supported by ADB and IFAD at a total cost of US\$17.1 million equal to about US\$344/ ha.

The first attempt, the RFS, suffered from poor engineering works with the result that attempts to irrigate failed and production had to be dependent on rains. The TTM, WB and PRC initiatives suffered from common weaknesses of omission of internal drainage systems, poor access, lack of flood protection works and high canal seepage losses. These weaknesses are similar to those of the RFS whereas the JPSP repeated a variance of large irrigation pump type of RFS in the same fields. The RIDEP experience was an attempt to correct irrigation engineering design faults of the three earlier small perimeter pump irrigated schemes (TTM, WB and the PRC)

without adequate financial provisions. The SSWCP, LADEP, PIWAMP and TTAM benefitted from the lessons learnt from JPSP and RIDEP. Overall the following valuable lessons have been accumulated from the twelve initiatives:

- i. Beneficiary involvement in the design and formulation of a rice development project/programme especially in site selection and choice of components are crucial for enlisting their commitment to succeed and sustain it as their own initiative;
- ii. The scale and level of sophistication of irrigation and mechanical technologies employed and their relevance to the national economy and the socioeconomic conditions of the farmers is critical for effective beneficiary involvement and sustainability of outputs including issues of spare parts and, local maintenance and repair services skills;
- iii. Availability of support services: production inputs such as seed, fertilizer and chemicals; institutional support services such as extension, credit and markets; and mechanization services such as land development, land preparation, irrigation and drainage, harvesting and post-harvest processing is critical for profitable production;
- iv. A balanced division of management attention and emphasis between timely organization of production inputs and services on one hand and ensuring timely crop husbandry practices on the other by technical/institutional support services is crucial for maintaining economic yield levels; and,
- v. The cost experiences of establishment of projects ranged from a low of US\$344/ha in PIWAMP to a high of US\$19,900/ha in RIDEP. Discounting the RFS and JPSP experiences as non-replicable options, the NRDS will focus on four main types of land development options: development of rainfed swamps; development of tidal irrigated swamps; rehabilitation of small perimeter schemes; and, establishment of new perimeter schemes in descending order of priority.

4 APPROACHES AND PRIORITY AREAS

4.1 Approaches

Cognizance of the ecological diversity of rice production conditions, lessons from the long history of rice development efforts, the regional tendency in the occurrence of rice ecologies, the overwhelming importance of rice to women farmers against the backdrop of the need for market-led, commercialized, efficient, competitive and dynamic rice industry, the NRDS will adopt a multi-prone approach. This approach will consist of the following elements:

4.1.1. Agro-Ecology-Based Promotion of Rice R&D

There is a large diversity of agro-ecologies suitable for rice production in The Gambia. These ecologies fall within two broad groups: lowland and upland ecosystems. Out of a total land area of 555,240 ha suitable for arable agriculture, about 216,121 ha is lowland ecosystem equivalent to about 39%. Of a total cropped area of 338,772 ha in 2013 season, 68,712 ha was under rice comprising of 48,946 ha upland, 17,434 ha lowland and 2,332 irrigated lowland. Thus, the lowland potentials for expanded rice production are good although the upland potentials for rice production are negligible and faced with stiff competition from coarse grain and groundnut production.

Table 4.1: Regional Distribution of Estimated Potential Rice Growing Ecologies in The Gambia

Region	Backswamp – Irrigated wet/dry (ha)	Tidal Swamps – mangroves & fresh water (ha)	Wulumbango (ha)	Bantafaro (ha)	Tandaco (ha)
WCR	-	21,454	4,436	1,405	6,098
NBR	-	44,203	4,078	20,179	-
LRR	-	39,637	1,602	7,895	-
CRR	2,492	33,684	2,082	4,877	-
URR	10,235	2,026	11,042	-	-
Total	12,727	141,004*	23,340	32,952	6,098

* includes 75,877 ha of potentially saline tidal swamp which cannot be used to grow rice in the absence of fresh water.

Source: LADEP Appraisal Mission Estimates – modified.

Table 4.1 presents the regional distribution of the estimated 216, 121 ha of lowland ecosystem comprising of six rice growing ecologies (Tidal comprising of mangroves & fresh water swamps).

Table 4.2: Summary of the Main Characteristics of Rice Production Ecologies

System of Production/ Resource Base	Principal Characteristics								
	Location	Soil type	Water Source	Method of Cultivation	Crop Establish	Current Yields kg/ha	Constraint	Potential	%age of Low Land Area
Irrigated wet/dry – 12,727 ha	Swampy land adjacent to Gambia river in CRR and URR of elevated areas.	Alluvial silty clays	Controlled pumping, no drainage	Power tillers	Trans-plant	(a) 5000 (b) 2000	Plot size needs mech. Iron toxicity	*2 crops	6
Mangrove swamp – 70,834 ha	Swamp adjacent to river subject to saline tidal flooding in dry season freshwater in the wet.	Alluvial silty clays	Freshwater tidal Manual/river flooding in wet season	Manual	Trans-Plant	800	Water control; heavy soils salinity, no access	,Husb.	65
Freshwater tidal Swamps – 70,170 ha	Swamps adjacent to river subject to freshwater flooding in wet season. No saline tide	Alluvial clays	Freshwater flooding by tide or high river	Manual/ Tractor	Trans-plant/ Broadcast	2000	Water control; soils	Husb.	
Rainfed deep flooded swamps – 23,340 ha	Swamp depression away from river/ bolons	Alluvial silty clays high O.M.	Rainfall runoff often supplemented by local flooding	Tractor /Manual	Trans-plant/ Broadcast	1500	Water control; soils , weed, flooding	Husb. Mech	11
Bantafaro – upland rainfed (Hydro-morphic/freatic) 32,952 ha	Higher elevation on the borders of the rainfed swamps	colluvial silty/ clays, hydromorphic	Rainfall min. standing water, bunding, 0-25cm	Manual/ Tractor	Broad-cast	700	Heavy soils weeds	Husb. Mech	15
Tandaco – upland rainfed 6,098	Upland depression associated with forest canopy, mainly WCR	Sandy loams high O. M. free draining	Rainfall	Manual	Broad-cast	1000	Stumps Drought Weeds	Husb. Mech	3

Source: The Rice Industry of The Gambia 1983 and Current Assessment

Each of the six rice growing ecologies has distinct ecological characteristics. Table 4.2 summarizes these ecology-specific characteristics. Whilst some of these ecologies are regional specific in occurrence, they generally differ both in terms of regional distribution and relative importance within regions. Thus for want of equity and rational use of arable land resources the

NRDS will, of necessity, give agro-ecology specific attention to rice promotion programme on rain-fed and fresh water tidally irrigable ecologies.

4.1.2. Promoting Small- and Large-Scale Rice Production

Taking into account the gender dimension of rice production with women constituting the majority of small-scale rice producers a disproportionate attention will be paid to small producers initially. However, considering the specific socio-economic conditions of the different potential production areas, the strategy will give equal emphasis to both small-scale and commercial production of rice. This is important as the needs and requirements of small-scale and commercial production are different with different type and intensity of interventions.

4.1.3 Gender Consideration

Traditionally gender division in agricultural production has been the *modus operandi*. Men are generally engaged in upland mechanized cropping, usually groundnut, maize and millet while women are mainly engaged in rice cultivation using intensive labour methods. However, this gender division is slowly breaking down with women being engaged in groundnut production and men being engaged in rice production with the introduction of NERICA rice varieties to a point of dominance in upland rice production.

Rice is a labour intensive crop the cultivation of which under difficult lowland conditions continued to be dominated by women. Given the government's resolve to address gender issues across the board, the NRDS will strongly consider gender aspects through interventions like introduction of labour saving technologies for rice production and processing, starting from technology generation up to markets.

4.1.4 Value-Chain Approach

Substantial post-harvest losses in rice production arise mainly from inefficient field level processing and milling operations. To minimize these loss factors an integrated approach in the implementation efforts of the Strategy will follow value-chain approach. This is to ensure that all actors along the chain will realize a fair share from the benefits of improved rice production. This will be ensured through innovations starting from technology adaptation and generation, institutional arrangement, production, post-harvest handling up to marketing of produce domestically and internationally. The engagement of private sector and farmers' organizations (cooperatives and associations) will be promoted along the value chain. Timely access to vital production inputs will be assured through establishment of revolving funds and access to micro-finance credit facilities such as VISACAs.

4.1.5 Environmental Sustainability

Given the history of swamp rice land development in particular, the Strategy will pay due emphasis to the sustainability of rice development activities by adopting interventions that will safeguard social, natural resource and economic sustainability. Implementation of NRDS will entail interventions which could have negative environmental impacts if not well planned. Some of the negative impacts could include:

- i. advancement of the salt/fresh water interface of the River Gambia due to over abstraction of water and inefficient irrigation water use by farmers;
- ii. prevalence of water borne diseases such as malaria, bilharzias, diarrhoea due to stagnant water in irrigation systems;
- iii. increased salinity and alkalinity of soils due to poor drainage systems and inappropriate application of fertilizers and agrochemicals;
- iv. development of acid-sulphate soils due to excessive exposure of the swamps; and,
- v. land degradation due to clearing of vegetation for establishing new areas for rice cultivation.

The NRDS implementation will anticipate and pre-empt the occurrences of such environmental hazards through continuous awareness and monitoring of fertilizer and agro-chemical usage; training of farmers on environmental issues related to irrigated agriculture including integrated pest management capacity building; training of technical staff on environmental issues in irrigation development; use of integrated water resource management approach in irrigation development to ensure equity distribution of water resources among different users; and undertaking periodic environmental impact assessment.

4.2 Priority Areas

The analysis of the land resource potentials in Sub-Section 3.2.1 of Chapter 3 established that the scope for expanding upland rice production in the immediate-term is negligible although the scope for expansion of lowland rice production is huge. In the light of this fact and considering the agro-ecology based and the value-chain approaches, the NRDS implementation will emphasize intensification of both upland and lowland production systems and expansion of lowland production systems during the 10-year Strategy 2015 – 2024. The priority areas in this regard are summarized as follows:

- i. Copious supply and improved timely access and use of improved seed varieties for upland, rainfed lowland and irrigated lowland, pre-harvest equipments, chemical fertilizers and pesticides;
- ii. Timely agronomy practices including proper pest management, proper land preparation technique, method and date of planting, proper seed rate along with type, rate and date of fertilizer application;

- iii. Mobilize communities to be involved in the development process and train technicians in water control management. Farmers especially Water Users Association (WUA) would also be trained in the operation and maintenance of the scheme;
- iv. Rehabilitation of irrigation canals, dykes and bunds for the established fields and develop additional 10,400 ha irrigation facilities of both surface and ground water using renewable energy for community groups and private individual entrepreneurs; and,
- v. Post-harvest handling through enhance availability of threshing and milling equipment, safe storage facilities, harvest piling and transporting, and addressing storage pest problem and timely provision of maintenance services.

5. VISION AND SCOPE OF NRDS

5.1 The Vision

The Gambia has 216,121 ha of lowland ecologies suitable for rice production. Of this total lowland area 81,120 ha are considered suitable for pump irrigation. Correspondingly per capita rice consumption in The Gambia is 117kg of which over 50% are imported. Out of an annual agricultural import bill of US\$86.89 million in 2011, rice imports accounted for 34% thus claiming a large junk of the national foreign exchange reserves. In the light of this paradox The NRDS is founded on a vision of “*self-sufficiency in rice production*” by the year 2024. The modalities for achieving this will be guided by the following goal and objectives:

5.2 The Goal

The foregoing NRDS vision presupposes the creation of a market-led, commercialized, efficient, competitive and dynamic rice industry consistent with sustainable development. The overall goal of the NRDS purpose is to enhance the enabling environment for systematic exploitation of the vast natural resource potentials, mitigation of the priority constraints in the resource base, provision of production oriented technologies suitable for broad-based participation and adoption by the majority of rice farmers for efficient rice production.

The structural transformation and rationalization of interventions in the industry will be the main mechanisms for change. It is this change process which will allow the industry to contribute to and benefit from the growth and development of the economy as the latter moves along a trajectory of industrialization.

5.3 The Objectives

The over-arching objective of the NRDS (2015/2024) is the creation of a market-led, commercialized, efficient, competitive and dynamic rice industry which maximizes enhancement of food security and poverty reduction. This objective strand will be accomplished through the achievement of the following elements:

- i. To increase domestic production by 15% annually over a 10-year period through the promotion of productivity-enhancing innovations of small and commercial local rice producers and entrepreneurs along the value chain;
- ii. To promote consumption and marketing of locally produced rice through quality improvement and value addition;
- iii. To increase availability of and access to safe and nutritious rice as food for the nation;
- iv. To promote public–private sector collaboration in rice production; and,

- v. To promote stakeholder innovation capacity for the utilization of rice by-products while ensuring sound environmental management practices.

5.4 Strategy Scope/Targets

From the analysis of rice production potentials as at 2013 presented in Chapter three, sub-section 3.2.1, it is established that the scope for expanding upland rice production in the immediate future is negligible. However, the scope for expansion of lowland rice production is huge. Thus NRDS will place equal emphasis on intensification in both upland and lowland production systems and expansion of lowland production systems during the 10-year Strategy 2015 – 2024.

The scope and targets of the Strategy in terms of production, scientific and technical personnel and financial and human resource commitment by the government are summarized as follows:

5.4.1 Projected Area, Production and Yield

Table 5.1 presents rice production targets in terms of area, yield and production projected from the 2013 base year under the three main agro-ecological conditions of rain-fed upland, rain-fed lowland and irrigated lowland.

Table 5.1: Rice Production in terms of Area, Yield, and Production in 2013 and Strategy Targets by Agro-ecological Condition

Year	Rainfed Upland			Rainfed Lowland			Irrigated Lowland x 2 crops			Total	
	Area (000) ha	Yield (tons /ha)	Prod (000) Tons	Area (000) ha	Yield (tons /ha)	Prod (000) tons	Area (000) ha	Yield (tons /ha)	Prod (000) tons	Area (000) ha	Prod 000 (tons)
2013	48.9	1.1	53.8	17.4	1.0	17	2.3	3.5	16	68.6	86.8
2019	65	2.0	130	63	2.0	126	5	5.0	50	100	308
2024	65	2.0	130	113	2.0	226	10.4	5.0	104	188.4	460

The assumptions underlying Table 5.1 are that:

- i. a 15% annual expansion of area in the two agro-ecological conditions of rain-fed upland and rain-fed lowland from the base year to 2015 being starting year of the NRDS;
- ii. no further expansion of rain-fed upland beyond the 65,000 ha in 2015 being year 1 of the NRDS;
- iii. rain-fed lowland is expanded at the rate of 10,000 ha per annum from the 2015 level of 23,000 ha; and,
- iv. irrigated lowland is expanded by an annual rate of 15% from the base year right throughout the period of the NRDS ending in 2024.

Based on the foregoing assumptions, the total production of rice by 2025 is projected to be 160,000 ha under improved rice production systems yielding about 460,000 tonnes of paddy rice. At 70% improved milling output, this represents an annual milled rice production of 322,600 tonnes which is in excess of the 2020 rice demand projection of 273,800 tonnes by about 18%.

More importantly, it exceeds the overall aim of CARD Initiative of doubling rice production during the planned period by more than six times.

5.4.2 Projected Increase of Researchers, Technicians and Extension Workers

Table 5.2 presents the number of researchers, research technicians and extension workers projected from the 2013 base year for the 10-year period, 2015 – 2024.

Table 5.2: Number of Researchers, Technicians, and Extension Workers in 2013 and Targets over the Strategy Period

	Agricultural Researchers with M.Sc or Ph.D.			Research Technicians			Extension Workers		
	Total	Rice specialists (full time)*	Rice specialists (part time)*	Total	Rice specialists (full time)	Rice specialists (part time)	Total	Rice specialists (full time)	Rice specialists (part time)
2013	5	5	2	15	9	6	235	128	107
2019	9	6	3	18	10	8	242	128	114
2024	9	6	3	25	15	10	242	128	114

*for each special area, if possible

5.4.3 Financial and Human Resource Commitment of the Government

During the past six decades government has been unflinchingly committing its financial and human resources for rice research and development. Thus, with the current commitment to increase public investment in agriculture by a minimum of 10% of national budget, continuation of the trend is assured.

Currently the government is implementing and/or starting up four major projects which will ensure continued financial and human resources commitment to rice production. These are the WAAPP, *Nema*, Food and Agriculture Systems Development Project (FASDEP) and Gambia Commercial Agriculture and Value Chain Management (GCAVCMP)

6 SUB-SECTORAL STRATEGIES

6.1 Key Strategic Interventions of the NRDS

In order to achieve its objectives as articulated in Chapter Five above, the overall strategic orientation of the NRDS will entail six sets of strategic actions in pursuit of a mission of substantially increasing rice production within the next 10 years. These actions are:

- i. Land Development, Irrigation Development and Paddy Production;
- ii. Post-harvest losses handling;
- iii. Processing (value addition) and Marketing;
- iv. Seed Development and Varietal improvement;
- v. Rice Production Inputs Supply Distribution; and,
- vi. Pests and disease management.

6.2 Sub-Sectoral Strategies

In view of the suggested approaches in addressing the priority areas identified in Chapter Four above and the objective framework, the NRDS is designed to have eight sub-sectoral strategies namely:

- i. strengthening the institutional framework and policy development
- ii. research, technology delivery and capacity building;
- iii. production and Dissemination of Rice Seed;
- iv. fertilizer marketing and distribution;
- v. irrigation and investment in water control technologies;
- vi. Equipment Access and Maintenance Strategy;
- vii. Post-harvest and marketing; and,
- viii. Finance and credit

6.2.1 Strengthening the Institutional Framework and Policy Development

Operational management (coordination, monitoring and evaluation) is a major part of the implementation and it cuts across all the strategy elements.

The government policy has emphasized the need for closer collaboration between various stakeholders in the innovation systems. NARI has now adopted a new strategy called Agricultural Research for Development (AR4D) in which all the stakeholders within the system are involved in the planning and implementation of research findings. However, stakeholder sensitization and training need to be carried out on this new innovation system for proper institutionalization. Similarly, the area of public-private partnership, capacity building, sound environmental management, micro-finance for agricultural production, development of the rice information system through ICT, collaboration with stakeholders both internally and externally among others need to be strengthened.

For effective implementation of the strategy, Sapa station of NARI will serve as the Centre of Excellence for Rice Research and Training. However, there is a need to strengthen the Station in terms of human and physical facilities. Specifically, there is a need to establish well-flagged site(s) for rice germplasm maintenance and seed multiplication, and establishment of required facilities for training.

In addition to the formal interventions that will be designed through the annual programme planning processes of the NRDS and the RRDSs and other partners, specific projects on the NRDS different aspects of the rice R&D will be designed and implemented in the short-, medium-, and long-term.

6.2.2 Research and Technology Dissemination Strategy

Studies have shown that linkages between research, extension and other stakeholders has not been very strong, thus most of the technologies developed are not successfully transferred to farmers. The linkage between research and extension is very weak. Thus the following strategy elements will be deployed:

- i. Introduce new research paradigm (Integrated Agricultural Research for Development IAR4D) which will facilitate participation in the generation and dissemination of agricultural technologies through more proactive partnering with research and extension systems;
- ii. Provide training for stakeholders on the principles of IAR4D;
- iii. Organize bi-monthly meetings, Annual Research Review meetings (ARREV) and workshops to sensitize stakeholders on different technologies developed by research;
- iv. Use video, film shows, drama, ICT etc to help inform target groups about the technology one intend to disseminate;
- v. Increase number of extension agents to reduce farmer –extension agent ratio;
- vi. Improve mobility to have regular visit of the extension agents to farmers; and,
- vii. Train farmers and extension agents on recommended agronomic practices.

6.2.3 Production and Dissemination of Rice Seed

Table 6.1 presents the projected seed requirement of the Strategy from 2014 base year. The total seed requirement as at 2024 is estimated at 427,980 tonnes. Cost-effective and good quality rice seeds are essential factors in the attainment of increased rice production in the Gambia. The National Seed policy has been enacted by the House of Parliament in 2011. The seed regulatory bodies (National Seed Council and National Seed Secretariat) have been established, however, the policy is yet to be translated into an act which will serve as the legal framework for the implementation of the seed policy. Therefore, this process needs to be fast-tracked in order to have an effective and efficient seed system.

Table 6.1: Projections of Seed Requirement for the Strategy

Year	Rainfed Upland			Rainfed Lowland			Irrigated Lowland			Total/Average	
	Area (ha) (000)	Seed rate (kg /ha)	Total (tons in '000)	Area (ha) (000)	Seed rate (kg /ha)	Total (tons in '000)	Area (ha) (000)	Seed rate (kg /ha)	Total (tons in '000)	Area (ha) (000)	Total (tons in '000)
2013	48.9	80	3.912	17.4	60	1.04	2.3	40	92	68.6	96.95
2019	65	80	5.200	63	60	3.78	5	40	200	100	208.98
2024	65	80	5.200	113	60	6.78	10.4	40	415	160	427.98

The capacity of NARI in terms of infrastructural and human resource development should be strengthened to help produce breeder and foundation seeds for onward transfer into the farming system. The seed system needs to be well organized to produce good quality certified seed. In doing this, certified seed producers have to be identified on commodity specific basis at different location in the country. The Community Based Seed System will be strengthened to encourage the provision of large quantities of quality seed within easy reach of farmers. The introduction of hybrid rice varieties and biotechnology would be used to increase rice production. Also the collaboration between the National agricultural research and extension systems (NARES) should be strengthened.

6.2.4 Fertilizer marketing and distribution strategy

The government through its parastatal, The Gambia Groundnut Company (GGC), is responsible for importation, marketing and distribution of fertilizer in The Gambia. For the past years, fertilizer has not been coming on time and at a price that is not affordable by most farmers. In The Gambia there is no local manufacturing of fertilizer. Thus procurement and distribution of fertilizer, access and affordability remain major challenges.

Table 6.2 Projections for Fertilizer Requirement Rates and Type for the Strategy

Year	Recommended Nutrient Requirements (kg/ha)									Total requirement (50 kg bag)) '000 Bags		
	Rain-fed Upland			Rain-fed lowland			Irrigated					
	Area Ha (000)	NPK	Urea	Area Ha (000)	NPK	Urea	Area Ha (000)	NPK	Urea	Area Ha (000)	NPK Tons	Urea Tons
2013	48.9	200	100	17.4	200	100	2.3	200	100	68.6	277	138
2019	65	200	100	63	200	100	5	200	100	100	400	200
2024	65	200	100	113	200	100	10.4	200	100	160	640	320

Table 6.2 presents the projected fertilizer requirement of the Strategy. The projected total fertilizer requirement at 2024 is estimated at 32,000 tonnes of NPK and 16,000 tonnes of urea. To meet its annual fertilizer requirements on a timely basis, the NRDS will propose to involve private sector in the blending of fertilizers based on ecology, soil, variety to be adopted by farmers and where possible, organic fertilizer will be part of the specific rice ecology blend.

Improvement of transportation and storage facilities nationwide is a need. Packing of fertilizer into appropriate small quantities will ensure easy access and affordability by smallholder farmers.

In order to remedy the existing problems of the industry, the following strategy elements should be put in place:

- i. Provide fertilizer to farmers on time and at affordable price;
- ii. Support the private sector to import fertilizers in to the country;
- iii. Set standards for effective quality control for fertilizers and other chemical inputs;
- iv. Create the enabling environment for private sector investment (national or foreign) for both manufacturing and importation of fertilizers into the country. This could be done through collaboration with National Agricultural Research Institute for Chemical Technology (NARICT) in Nigeria. This company manufactures neem-based organic fertilizer and approached potential investors in The Gambia for joint investment in producing fertilizer in the country;
- v. Encourage use of organic-based fertilizers to ensure good maintenance of the soil fertility and soil biodiversity; and,
- vi. Establishment of new and refurbishment of old seed stores in the country to facilitate access to farmers.

6.2.5 Irrigation and Water Control Investment Strategy

Irrigation and water control investment will be the responsibility of the Ministry of Agriculture with beneficiary participation collectively and/or individually. This will be effected in phases of short- (1-3 years), medium- (3-5 years), and long-term (> 5 years) taking into consideration the country's regional dispersal of rice ecologies, regional agricultural administrative structures and climatic variations/patterns.

Short-term (1-3 years) strategy actions would be:

- i. expansion of NERICA rice production in Bantafaro and Tandaco ecological conditions;
- ii. construction of rainwater harvesting and storage structures for small-scale irrigation and improving soil moisture through promotion of in-situ soil moisture conservation technologies;
- iii. rehabilitation of water control structures and facilitation access for the expansion of rain-fed deep-flooded swamps;
- iv. rehabilitation and/or expansion of swamp rice fields of both fresh water and brackish water zones; and,
- v. promotion of appropriate rice varieties suitable for brackish water conditions and construction of irrigation infrastructures for water management to prevent salinity problems;

Medium-term (3-5 years) strategy actions would be:

- i. increase irrigation extension and management systems through staff and beneficiaries capacity building;
- ii. rehabilitation of existing perimeter irrigation schemes (adopting renewable energy resources and/or hybrid pumping systems with well designed back-up training modules in repair and maintenance); and,
- iii. strengthening the collaboration and linkages between national, regional and international institutions involved in rice research and development program.

Long-term (5 years onwards) strategy actions would be:

- i. expansion of areas in lowland irrigation through construction new irrigation and drainage schemes and consolidating rehabilitated perimeters;
- ii. increase access to improved water saving irrigation technologies; and
- iii. encouraging private sector investment in medium and large-scale irrigation schemes using underground water resource.

6.2.6 Equipment Access and Maintenance Strategy

In order to ensure easy and timely access to farm equipment, the government in the short term plan will facilitate the supply of power tillers and accessories, water pumps, tractors and accessories, seed drills, transplanters and rotary weeders. The government will encourage private sector to play a key role in public-private partnership ventures. Empowerment of the communities in accessing and use of equipment for maintenance of irrigation systems (clearing of irrigation and drainage canals) will be encouraged. This strategy can only be implemented by building the capacity of communities, farmers, and entrepreneurs to efficiently operate and maintain the farm equipment and accessories. The following strategy elements are recommended to be in place:

- i. Develop and introduce appropriate machinery for efficient land preparation (ploughs and harrows), planting (seeder) harvesting (harvesters);
- ii. Strengthen the capacity of engineering program of NARI to develop appropriate equipment for producers;
- iii. Train farmers and extension agents on the operation and maintenance of the equipment; and,
- iv. Train a group of blacksmiths as trainers on the development and assemblage of farm equipment.

6.2.7 Post-Harvest Processing and Marketing Strategy

In order to promote and sustain profitable rice production, it is essential to minimize post-harvest losses and also improve the quality of rice to meet the market demand. The use of harvesting and threshing equipment will be encouraged. Reduction of post-harvest losses will be pursued through the following strategy elements:

- i. Renovate old and establish new storage and paddy drying facilities for rice at different parts of the country;
- ii. Set standard to help monitor and control the quality of rice produce in the country to compete the imported rice;

- iii. Develop and introduce efficient equipment for threshing and milling of rice at various parts of the country;
- iv. Encourage consumption of locally produced rice through tax on imported rice;
- v. Encourage parboiling through training and introduction of necessary equipment;
- vi. Establish warehouses for milled rice at central locations of major producing and consumption areas;
- vii. Establish marketing credit lines and build capacity of marketers and processors at various market centres.

6.2.8 Finance and Credit

Credit for farming operations is provided by Social Development Fund (SDF), which is supported by the Central Bank, through community-based Village Savings and Credit Associations (VISACAs). The repayment rate under SDF is considered satisfactory under the micro-finance best practices. Women farmers, who will be benefiting from this credit scheme, are considered as good payers of loan in the project area. Credit will be provided both for short- and medium-terms through VISACAs.

VISACAs have a long history of providing credit to farmers since the 1980s at market interest rate. Following the IFAD support and strict supervision by the Central Bank of The Gambia, the VISACAs including those in the project area have the capacity to manage the proposed credit funds. To improve access to seasonal farm inputs, such as fertilizer, producer organizations will be encouraged to become members of VISACAs to make their members eligible for obtaining credit facilities during the cropping season. The individual farmers will pay membership fees, register, and open savings accounts against which they can borrow. The VISACAs also, mobilize savings from their members and pay market interest rate that varies according to the period of the savings. Currently the interest rate on loans ranges between 28-35% while that on the savings is 15%. In the project area, there are currently fifteen VISACAs, certified by the Central Bank that are being strengthened through the Rural Finance and Community Initiative Project co-financed by the Government and IFAD.

To improve business skills of the private sector to better service the farmers, individual entrepreneurs will be trained in business planning, book keeping and marketing. Institutions selected through short-listing will conduct the training. The service providers will include the Indigenous Business Advisory Services (IBAS), Social Development Fund (SDF), Management Development Institute (MDI), VISACA Promotion Centre (VPC) and the West African Insurance Institute. This training will enable the private entrepreneur to develop basic business plans that will be used as a basis for applying for loans. The promotion of the private sector will ensure the continuous provision of agricultural inputs. The selected institution will advertise the training modules; and develop all the necessary training materials and conduct the training accordingly and will also be responsible for the monitoring and mentoring successful entrepreneurs to ensure that they appropriately apply the acquired skills.

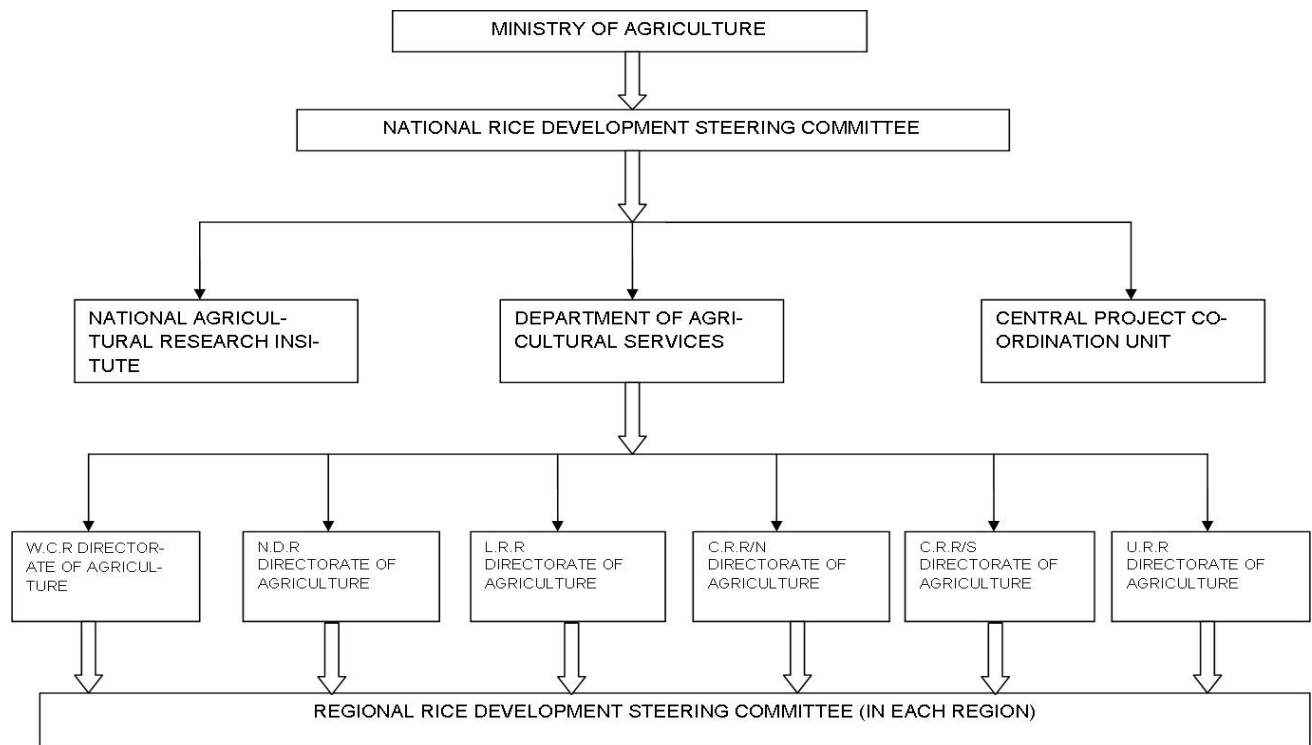
- i. Organize farmers into community-based organizations; and,
- ii. Provide training to farmers and link them to credit institutions for easy access to credit, inputs and equipment.

7. IMPLEMENTATION STRATEGY

7.1 Institutional and Implementation Arrangements

The NRDS will be implemented by the Ministry of Agriculture (MOA) assisted by a National Rice Development Steering Committee (NRDSC) through the collaborative efforts of the National Agricultural Research Institute (NARI), Department of Agriculture (DOA) and the Central Projects Coordination Unit (CPCU) at the national level. At the regional level, the Strategy will be implemented by the Regional Agricultural Directorate (RAD) assisted by Regional Rice Development Steering Committee (RRDSC) in each region.

Figure 7.1: Governance Structure for the Implementation of the NRDS



7.1.1 Governance of NRDS

Figure 7.1 presents the governance structure for the implementation of the NRDS. In line with the regional orientation of the field administration of agricultural development and differences in the relative regional importance of rice ecologies, the field implementation of the NRDS will be

on regional basis under the national agricultural policy and programme leadership of the Ministry of agriculture.

The national level structures of the governance will include:

1. The Ministry of Agriculture (MOA) and its technical arms of:
 - National Agricultural Research Institute (NARI);
 - Department of Agriculture; and,
 - Central Projects Coordination Unit (CPCU)

2. The National Rice Development Steering Committee will assist the MOA in its programme planning, evaluation and review functions and will comprise of the following key stakeholders:
 - i. Focal Point of NRDS;
 - ii. Project Coordinator Rural Finance Project
 - iii. Project Coordinator WAAPP;
 - iv. Department of Planning Services;
 - v. Agribusiness Services;
 - vi. National Agricultural Land and Water Management Development Project (NEMA);
 - vii. Director General of National Agricultural Research Institute – Co-Secretary;
 - viii. Director General of Department of Agriculture - Secretary;
 - ix. Coordinator, Central Projects Coordination Unit – Co-Secretary;
 - x. MOA Deputy Permanent Secretary, Projects and Programmes - Chairperson;
 - xi. Women’s Bureau; and,
 - xii. President of the Farmers’ Platform

The regional level structures of the governance will include:

1. The Regional Agricultural Directorate (RAD); and,

2. A Regional Rice Development Steering Committee (RRDSC) in each of the six agricultural field administrative regions. The RRDSC will assist the regional annual rice programming, evaluation and review functions of the RAD and will comprise of the following key stakeholders:
 - i. The Regional Governor – Chairperson ;
 - ii. The Regional Director of Agriculture - Secretary;
 - iii. Rural Finance Project;
 - iv. Department of Planning Services;
 - v. Agribusiness Services;
 - vi. National Agricultural Land and Water Management Development Project (NEMA);
 - vii. Women’s Bureau;
 - viii. National Farmers’ Platform;
 - ix. National Agricultural Research Institute; and,
 - x. NGO with rice as a core programme.

7.1.2 Partnership Arrangements

The NRDS will be promoting effective partnership with all stakeholders within the country and regionally such as IRRI, AfricaRice, JIRCAS, and CARD. The National Agricultural Research Institute (NARI) will take the responsibility in strengthening this partnership. In addition, the National Rice Development Steering Committee will promote partnership at the sub-regional and national levels.

The CPCU will promote Project-based collaboration and effective partnership among all stakeholders as an approach in implementing the different aspects of the NRDS. The Regional Rice Development Steering Committees will promote partnership within their jurisdictions especially with NGOs active in supporting rice development activities.

7.1.3 Monitoring and Evaluation

Both monitoring and reporting will be critical, to assess the efficiency of the actions and the fulfilment of the targets and also to give feedback to the international donors and private investors. In fact, the progress towards the accomplishment of the different targets and activities outlined in the Strategy should be evaluated each year to assess their degree of achievement. At the same time the Strategy will be reviewed periodically based on worldwide technological developments in this sector and the emergence of variations in the climatic pattern of The Gambia.

In addition to the current (and ongoing) reporting and monitoring requirements of annual agricultural production under the NASS, activities undertaken under the Strategy should be part of a continuous program of monitoring, involving the relevant stakeholders in the rice industry as part of the successful implementation process of the strategy..

The Strategy will be evaluated at end of every cropping season to assess the degree of achievement and the progress of the different activities and measures included in the framework, and to ensure that the overall direction of the Strategy remains the best (least cost and lowest risk) option for the generality of small farmers especially the women rice farmers. The Strategy emphasis will be updated if amendments are required.

The Central Project Coordination Unit under the supervision of the Ministry of Agriculture has the ultimate responsibility for monitoring and evaluating the implementation of this Strategy at two levels: national and regional levels, based on the guidelines provided by the National Rice Development Steering Committee and Regional Rice Development Steering Committee. For this purpose a set of indicators is proposed in order to ensure the strategy is achieved during the expected time period.

The assessment's results regarding these indicators, as well as the recommendations obtained from this analysis, will be published in an annual report which will be submitted to Cabinet by the Hon. Minister of Agriculture.

The tentative indicators for the annual assessment of the performance of this strategy over the period 2015-2024 might be:

- i. Number of villages and hectares of the different types of rice grown.
- ii. Number of Rice Growing Associations.
- iii. Contribution of the crop sub-sector to GDP.
- iv. Percentage share of rice in agricultural imports.
- v. Percentage share of rice in the National Food Balance Sheet.
- vi. Estimates of upland, swamp and irrigated (disaggregated into tidal and pump) total rice production in hectares and tonnes of production.

7.2 NRDS Financing

In addition to the government's and the research-dedicated WAAPP, *Nema*, FASDEP and GCAV funding in most of the interventions, project based partnership in funding selected R&D activities as is currently the case with the *Nema* will be the main financing strategy to be promoted. The NRDS together with the CPCU will overlook the development of specific projects.

In promoting financing of intensive activities like irrigation schemes, it is suggested to (i) promote cost sharing mechanisms with beneficiaries (small-scale farmers, private investors) in installation and maintenance, (ii) donor assisted irrigation schemes; and (iii) public funded irrigation schemes.

Based on the lessons learnt from previous rice R&D experiences in sub-section 3.2.6, strategy scope/targets in sub-section 5.4.1 and the proposed irrigation and water control investment strategy for the NRDS in sub-section 6.2.5 above, a plausible indicative planning figure is estimated at about US\$865.25 million over the 10-year period. In terms of timing, this figure will comprise as follows:

- i. The short-term – 1-3 years: 88,000 ha at an estimated cost of US\$344/ha = US\$30.27 million and 90,000 ha at US\$8,000/ha = US\$720 million totalling US\$750.27 million;
- ii. The medium-term – 3-5 years: 3,400 ha at US\$11,056/ha = US\$37.59 million; and,
- iii. The long-term – 5 years onwards: 7,000 ha at US\$11,056/ha = US\$77.39 million.

7.3 Sustainability Mechanisms

The due attention given by the government for the development of the rice sub-sector and existing potentials along with recent tremendous expansion in rice production, confirm the huge potential of sustainability of promoting the sub-sector. In addition, the established partnership between rice producing countries and the Secretariat of the Coalition for Africa Rice Development (CARD) and the Network established between national institutions with

international institutions associated with rice development (Africa Rice, IRRI etc.) is expected to ensure regular supply of new technologies. In this regard, strengthening the started public interventions, the NERICA project in particular, along with the strengthened partnerships and networks will be key in promoting the sustainability and competitiveness of the sector.

8. CONCLUSION

Through improved cultivated area expansion and intensification to increase production and productivity, rice production will be greatly enhanced and total milled rice output more than quadrupled during the Strategy period 2015/2024.

The priority interventions in the identified agro-ecologies to achieve increased rice production will be through:

- In the short-term (1-3 years): the expansion of NERICA in upland and lowland conditions; rainwater harvesting and storage for small-scale irrigation and in-situ moisture conservation technologies; rehabilitation and expansion of deep-flooded swamps and tidal irrigation infrastructure; and promotion of irrigation water management and agronomy will be focus.
- In the medium-term (3-5 years): intensification of rice production through the extension of irrigation infrastructure and management systems; rehabilitation of existing perimeter irrigation schemes using renewable energy and hybrid pumping systems; and strengthening national, regional and international collaboration in rice R&D will be the priorities.
- In the long-term (beyond 5 years): the expansion of lowland irrigation through new irrigation and drainage schemes and consolidation of rehabilitated perimeters; increasing access to improved water saving irrigation technologies; and, encouraging private sector investment in medium and large-scale irrigation schemes using both surface and underground water resources.

The envisaged development and expansion of improved irrigation infrastructure, and a commercial agricultural production management systems, emphasizing agro-ecology-based and value-chain approaches, would enhance sustainable increase in rice production and productivity. These strategic actions and approaches are designed to achieve not only the NRDS aim of doubling rice production in ten years but also achieving its underpinning vision of “*self-sufficiency in rice production*” by the year 2024 or much earlier as articulated in vision 2016.

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ANNEX ES

Annex 1: List of Participants in Focus Group Discussions

No.	Village		
	Boiram	Sankuya	Salikene
1	Alieu Secka	Talibeh Sanyang	Fatty Fofana
2	Issaca Ndaw	Wandifa Fofana	Nyara Kanyi
3	Awa Jange	Fatou Lamin Fofana	Lamin Hydera
4	Ebou Boye	Fatouba Fofana	Kemo Ceesay
5	Alh Abdou Hawa Boye	Aramata Darrboe	Mamadou Ceesay
6	Agie Chan Boye	Abie Fofana	Mabintu Dibba
7	Agie Fanta Boye	Kitim Saidy Khan	Nyarra Fatty
8	Abdou Hata Boye	Momodou Fofana	Ba.Saikou Kanteh
9	Alieu Sisay	Seedy Fofana	Saikou Ceesay
10	Kebbe Surr	Nakebba Kanyi	Zakaria Touray
11	Sarjo Trawalley	Nfamara Sanneh	Abdou Njie
12	Haddy Yassin Boye	Foday Fofana	Njobodi Fatty
13	Mbacho Boye	Jonyi Fofana	Mariama Fofana
14	Jangfolo Camara	Juju Fofana	
15	Basirou Boye	Fumbulu Fofana	
16	Chundou		

Annex 2: List of Constraints Identified by Focus Groups

No.	Constraints Identified by Focus Group per Village		
	Boiram	Sankuya	Salikene
	Tractors and power tillers are either not available or expensive to afford for ploughing	Insufficient tractors and power tillers for ploughing and some-times expensive	Hiring of tractors for ploughing is expensive and sometimes not available
2	Inadequate threshing and milling machines	Lack of credit facilities	Fertilizer timely availability and affordability
3	Processing materials(packaging and sealing material)	Fertilizers	Low prices of produce
4	Fertilizer is either not available or not affordable	Herbicides	Lack of sufficient quality seeds
5	Sweepers to aid in clearing of canals	Harvesters	Poor roads network in the rice fields
6	Lack of credit facilities to enhance sustainable production	Milling machine	Termites infestation
7	Lack of drying floors and storage facilitiesfor produce	Seed(Specification by ecology)	Lack of rice threshing machine
8	Unreliable markets		Lack of storage facilities
9	Unstable market prices		Drying floor
10	Poor marketing information communication		Iron toxicity, salinity & acidity
11	Prices are determined by the demand and supply of goods		

Annex 3: List of Representatives of Key Stakeholder Institutions at the Validation Workshop

NO.	NAME	INSTITUTION	TELEPHONE	EMAIL ADDRESS
1.	Sheriffo Bojang	MOA	9912781	sheriff_1@hotmail.com
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10.	Fatou Samba	NACOFAG	9920315	sambanjai@yahoo.com
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26.	Jalika Bojang	Nema	9815060	Jalika11@yahoo.com
27.	Jerro Maane	SLMP	9937822	jmaane@hotmail.com
28.	Njagga Jawo	NAWFA	9948312	Njagab52@yahoo.co.uk
29.	Elizabeth Loum	Nema	9936677	Loum_elizabeth@yahoo.com
30.	Lamin A. Jarju	ADWAC/NBR	9848450	Philanthrop28@yahoo.com
31.	Kaba Touray	DOA/Jenoi	9954789	ktouray@yahoo.com
32.	Lang K. Kinteh	DOA/URR	9935996	Langkinteh805@gmail.com
33.	Ousman Bajinka	RAD/CRR-N	6534137	

Annex 4: Proceedings of the validation workshop and Report of the Working Groups

As part of the implementation of activities relating to the development of the National Rice Development Strategy in The Gambia, a one day consultative validation workshop was held on the 29th October, 2014, Co-organized by the Development Management Consultants International (DMCI) Supported by the IFAD-Sponsored National Agricultural Land and Water Management Development Project (Nema) of the Ministry of Agriculture (MOA). The Objectives of this meeting are to; strengthen partnerships between actors in the rice value chain and to validate the draft document developed by the consultant team.

The workshop congregated key individuals representing the major partners who are involved in policy making, research and development activities within the rice sector. The participants include the representatives from the Ministry of Agriculture, NGO fraternities, Agriculture Extension Officers, Gambia National Farmers Platform (GNFP), National Rice development Strategy focal person, National Women Farmers Association (NAWFA), Agric. Business, GBOS, GCCI, LHDP, ADWAC, NACOFAG e.t.c.

OPENING OF THE WORKSHOP

The Workshop was open with the normal traditional silent prayers. The Director General of NARI, Mr Ansumana K. Jarju chaired the workshop, and before passing onto the Coordinator of the Central Project Coordinating Unit for opening remarks, he outlined the importance of the workshop. He mentioned that the meeting was very timely considering that the country is also striving towards a self sufficiency in Rice production. He buttressed the fact that given the pivotal socioeconomic role of rice sector as food and feed provider, household income and foreign exchange earner, therefore, an efficient, productive, and sustainable agriculture is critical for powering economic growth, reducing hunger, poverty and environmental degradation, the DG explained. He further emphasizes that; the attendees of the workshop should take this validation workshop with earnestness because the document will serve as a guide and road map for rice development in The Gambia.

The Coordinator of the Central Project Coordinating Unit, Mr. Falalo Touray, on behalf of the Minister of Agriculture gave the opening remark. In his opening speech, he noted the importance of this session that needed to be given utmost care and attention. He said he is very delighted to see different partner in the rice value chain coming together to build more partnership and work together in order to validate this important document. He mentioned that he is very pleased to NeMA project for supporting this validation. He first welcome all to this august gathering which by all accounts is a history in the making, a history in the making for three main reasons: firstly, it is taking place against the backdrop of his excellence the president's pronouncement of vision 2016 of Rice self- sufficiency in The Gambia, the very first articulation of a national rice policy goal: Secondly, in the annals of about six and half decades of pursuit of a tactic policy of rice self-sufficiency through the implementation of about twelve well designed rice development projects, the NRDS represents the very first comprehensive plan to address the issue within the framework of an overt policy of rice self sufficiency ; and Thirdly, the NRDS is designed with the purpose to enhance the environment for systematic exploitation of the vast natural resource potential. We went further to reaffirm the government's acknowledgement of the relevance of the CARD initiative to our national as well as regional development objectives of achieving sustainable food security. While describing the validation

as a step in the right direction, he implored on the participants to use the one-day forum diligently and progressively to work towards it. Mr. Touray said he had no doubt that the invited participants are all fully dedicated staffs working within the rice value chain and he is sure that the one-day workshop would be very fruitful.



From left to right: Mr. Sambou kinteh, lead consultant, Mr. Ansumana Jarju, DG NARI, Mr Falalo Touray, CPCU Coordinator

Review of the executive summary of the NRDS Document

A brief presentation was given by Mr sambou kinteh on th executive summary of the NRDS document, he commenced the presentation by going through the introduction and background of the Gambia rice sector, in his part, he discussed on Rice as the staple food of The Gambia with a per caput consumption of 117kg per annum of which only 17% is produced locally. The country has a long history of rice importation to meet its deficit in consumption. He has talked about the located in the valley of the Gambia River on the west coast of Africa. He went further to buttress on the National rice sector, challenges & opportunities facing national rice sector development, approaches and priority areas, vision and scope of NRDS, sub-sectoral strategies, implementation strategy and conclusion



Overview of participants during the consultants' presentation

Comments and suggestions on consultants presentation of the executive summary

- ❖ Executive summary number 20: 2014 should be 2024 and a target production of 322,600
- ❖ Participants are concern with the M&E framework which needs to be develop and included in the documents
- ❖ Activities have been outline but support enterprise is lacking especially supporting private enterprises e.g linking them with the Banks.
- ❖ Agriculture problem faced by farmers are not included very well in the document.
- ❖ Climate change related issues should be included in the sub-sectoral strategy.
- ❖ Steering committee members should be institutions that are here to stay permanently and not projects.
- ❖ There should be a risk matrix develop to take care of disaster management issues.
- ❖ Citation on figures should be well included
- ❖ Developing the seed systems and not seed development.
- ❖ In the executive summary bullet 29: the cost of planning for \$865.25 million.
- ❖ NASS report in terms of production is not including the dry season (irrigation).Units of DOA like CEES, FTS should have a representation in this validation.



Working group

WORKING GROUP DISCUSSION

Based on participants' consensus, partners were divided into four main working groups based on the different thematic areas. The groups are as follows;

Group 1: Challenges and opportunities

Group 2: Approaches and priority Areas, vision and scope of NRDS

Group 3: Sub-sectoral strategies

Group 4: Implementation and Conclusion

After a thorough discussion by the different four group members, partners met for a plenary meeting and each group presented on their critics of the documents for proper validation. Below are the critics and suggestions from the participants from the respective working groups.

Group one comments and suggestions : Challenges and opportunities

- **Group Members:** Kaba Touray (DOA LRR)
Njagga Jawo (NAWFA)
Lamin A Jarju (ADWAC)
Ousman Jarju (LHDP)
Olimatou Deen Sarr (GCCl)
 - ❖ page 13, 3.11. line 2 highlights priority rankings of 1-7 while 1-6 is being reflected on table.
 - ❖ To include lack of drying floors and storage facilities for produce.
 - ❖ All priority rankings to be presented in a tabular form (e.g pre & post Harvest mechanization technology Challenges & land tenure & social constraints in rice Production).
 - ❖ Institutional challenges and coordination are not being reflected in the document.
 - ❖ Another additional challenge is Policy intervention (interference of government policies)
 - ❖ No environmentally related challenges being indicated.
 - ❖ 3.2.5 page 17; existence of conducive policy environment and political commitment
 - ❖ Page 18 3.2.5 addition: Government pronouncement of v2016 strategy
 - ❖ Existence of a vibrant and proactive local and international NGO's that supports food security particularly rice production.

Group two comments and suggestions: Approaches and priority Areas, vision and scope

Group members: Mawdo Giana- DOA
Yankuba Darboe- NFPG
Ebrima Colley- Environment
Yaya Samateh- Trade
Miki Jawla- Nema
Lang Kinteh- DOA (URR)

Approaches and priority area

- ❖ Regional ecological potential area is missing in the document page 21
- ❖ Village rice farmer's input association (ie farmers to be provided with both production credit and consumption credit on rice production)
- ❖ Intensification of the production rate rather than increase area for production
- ❖ The group also agreed that emphasis should on intensification with the availability, affordability, accessibility and timely support to farmer for farm inputs.

Gender

- ❖ To provide appropriate technologies for both men and women farmers in upland and lowland ecology

Priority area

- ❖ To mobilize communities to be involved in agro-forestry practices for land improvement program
- ❖ Mechanization of agriculture farming from pre to post harvesting (land preparation, planting and transplanting weeding harvesting and processing)
- ❖ Subsidies to farmer
- ❖ To create investment opportunities to farmers

Vision and Scope

- ❖ Intensification of production to increase yield from **1.2 tones to 5 tones.**

Group three comments and suggestions: Sub-sectoral strategies

Group members: Mr. Njie (NEMA)
Mr Jaiteh (NARI)
Mr. Gomez (NARI)
Mrs. Barry (Agric. Business)

Key Strategic Interventions of the NRDS should be arranged in the below format:

- vii. strengthening the institutional framework and policy development
- viii. Land Development, Irrigation Development and Paddy Production;
- ix. Post-harvest losses handling, processing (value addition) and Marketing
- x. Seed system Development and Varietal improvement;

- xi. Production Inputs Supply and Distribution;
- xii. Integrated Pests and disease management.
- xiii. Finance and credit

Sub-Sectoral Strategies should include the following:

- ix. Research, technology delivery and capacity building;
- x. irrigation and investment in water control technologies
- xi. Production and Dissemination of quality Seed;
- xii. fertilizer marketing and distribution;
- xiii. Equipment Access and Maintenance Strategy;
- xiv. Sustainability mechanisms
- xv. Creation and development of enterprises (smes, youth groups fbos)

Short-term (1-3 years) strategy actions would be: Expansion and intensification of NERICA rice production in Bantafaro and Tandaco ecological conditions and the service providers will include the GIEPA, Agric. Business, Social Development Fund (SDF), Management Development Institute (MDI), VISACA Promotion Centre (VPC) and the West African Insurance Institute.

Group four comments and suggestions: Implementation and Conclusion

Group members: Musu Koma (GBOS)
Fatou Sambou Njai (NAWFA)
Fanding Saikyhan
Mr. Bho (M & E MOA)
Romul Anyal (NDMA)

- ❖ NRDS Committee to include (Page 36)

NAWFA
NACOFAG
Central Bank/Non- Banking Financial Institutions
Lands department
NDMA
Institutions and not portfolio or titles

- ❖ Regional level structures to exclude
Rural Finance Project
Department of Planning Services to be changed to Planning Service unit as applicable

- ❖ Suggestion
Need for higher level committee on rice development that MOA will report to, by the name: National Rice Production Advisory Committee chaired by the President. We believe this will connect the vision 2016 to our blue print

- ❖ Partnership Arrangements (Page 37)

Include public private partnership and to also clearly state the role of each of these partners along the rice value chain

❖ M&E

Mr Boe work with the consultant in the description and Review the indicators inline with the sectoral priority indicators and with the SMART criteria

CLOSING REMARK

The workshop was closed with remarks from the Deputy Director of Pest Management Unit, Mr. Landing Sonko. In his remark, he emphasizes the need to work together as a team if we want to achieve our goals and also for a very fruitful implementation of the strategy. He further merits NeMA for the support and all the representatives from all organizations for participating in the workshop.

Annex 5: Detailed Monitoring and Evaluation Arrangements for the NRDS Proposed by the Validation Workshop

5.1 NARDS Performance Monitoring

The NARDS will be monitored and evaluated through all the individual projects and programs that will be developed and implemented in the rice value chain between 2014 and 2024. Each project will have specific planned results and targets and the aggregate of these and all the interventions and investment in the Gambia Rice Value Chain will constitute progress, results/benefits achieved. Three formal rice value chain evaluations will be carried in 2015, 2019 and 2024. However, individual projects focusing on any rice development interventions, will be evaluated in accordance with the project schedule of evaluations. This section outlines the M&E institutional arrangements and processes under the NARDS and how these will be linked to the broader Agriculture Sector Participatory Monitoring and Evaluation System (Ag-sector PM&E System). A detailed performance management plan will be developed for each project or intervention in the rice value chain. This plan will guide and focus all M&E activities of the NARDS to ensure that reliable data/information on all investments/interventions in the rice value chain is timely generated and shared with leadership and Ag-sector partners, for use as the basis for evidence based planning and decision making.

5.2 Description of the M&E arrangements under the NRDS

The NRDS M&E will be anchored on the Ag-sector PM&E System which was recently completed. The system will form the basis for collecting, processing and sharing all data from the rice value chain in order to ascertain both implementation progress and the evolution of results/benefits from all investments in the rice value chain. Structurally, the Ag-sector PM&E system has four levels of data collection and management i.e. Village, Regional, Departmental/Project PMU level and the National System MoA Apex level led by the Planning Service Unit M&E Officer and supported by the CPCU M&E Officer. These 2 officers will lead NRDS M&E activities. In addition to the 2 lead apex M&E Officers at PSU and CPCU, 4 department level M&E units/M&E Officers; several project level M&E Officers and assistant M&E officers (11 at the moment); a pool of 14 data entry clerks; 6 regional M&E focal points;

210 village level data collectors and; a huge contingent of farmer group secretaries trained to capture records as rice production, processing and marketing occurs, are in place.

The M&E System consists of 2 distinct but complementary “Arms” built on a set of selected sector priority indicators. The first “arm” of the system is called the **Regular Progress Monitoring** and it tracks implementation progress and the short term results and benefits based on process indicators and some few outcome indicators. A complete toolkit consisting of diverse data collection instruments is in place and village based data collectors (extension staff) were trained on how to use them. The second arm is called **Periodic Evaluations and Surveys**. Under this arm all project and program evaluations, an annual National Agricultural Sample Surveys (NASS) and other specialized surveys are carried out to gather large amounts of data on the major crops like rice e.g. the area under crops, the crop yields, total crop produce/harvest, crop produce marketing, technology application and adoption, and many other variables specified in the priority outcome and impact indicators. The M&E System toolkit also consists of a set of survey questionnaires for NASS and other surveys like the Market Information on prices and product availability).

Other crucial components of the Ag-sector PM&E System include an elaborate M&E Framework which detail, among other things, the 57 priority indicators, the key reflection platforms and the scheduled M&E activities including reporting schedules, Terms of references for all M&E positions. An online Gambia National Agriculture Database (GANAD) forms the heartbeat of the Ag-sector PM&E system which is run on a solid ICT infrastructure linking all regions, projects and departs to a centrally managed server and data processing units at the PSU and the CPCU. Data is captured and organised in partner specific modules and for which hundreds of specified reports can be generated. Further data analysis is carried out in SPSS. A data quality control protocol is also in place and the 2 Apex M&E Officers are responsible for its implementation.

A satellite imaging monitoring system provided by the European Satellite Agency (ESA) and Sarmap also exists to track area under rice production and yield estimates.

5.3 Main outputs of the Ag-sector M&E system

The system will periodically produce and share: raw data on rice and other value chains, for further analysis and reference; Quarterly Narrative Progress Reports; Evaluation and Survey Reports including baselines; Periodic Bulletins and policy briefs and; any special report as per

request by partners and management. The data will be based on some of the indicators the sector priority indicators that will form the basis for tracking and evaluating the implementation progress and the evaluation of results and benefits for all interventions in the rice value chain. The list below is not definitive, neither is it exhaustive, but provides indicative variables that could be crucial for tracking.

1. Change in rice imports
2. Change in rice exports
3. Proportion of rice farmers that are realizing an increase in income from sale of rice, disaggregated gender, age and region of farmer
4. Number of people employed in the rice value chain disaggregated by value chain segment, gender, age and region of the VCA.
5. Change in area under rice production disaggregated by rice production type and by region
6. Number of infrastructure constructed targeted for the rice value chain disaggregated by type and region
7. Proportion of rice farmers that timely accessed inputs (to include farm machinery/equipment, seed, fertilizers and chemicals), disaggregated by type and by gender, age and region of farmer
8. Quantity of inputs (certified seeds, fertilizer, agro-chemicals) procured disaggregated by input type
9. Number of agro-dealers that are supported to develop business to supply rice production inputs disaggregated by region
10. Proportion of farmers that are realizing an increase in rice yield (MT/Ha) disaggregated by production type and by gender, age and region of farmer.
11. Change in annual national paddy rice production (MT) disaggregated by region
12. Number of rice value chain actors that are applying improved technologies for increased yield, disaggregated by technology type, gender, age and region.
13. A national seed production and certification system is in place
14. Quantity of certified rice seed produced locally, disaggregated by type of seed, variety and region
15. Number of private partners supported to engage in value addition disaggregated by Value Addition type and region

16. Proportion of rice milling machines in operation disaggregated by category/capacity of machine and by region
17. Quantity of rice sold disaggregated by market type and region (this indicator will also capture quantity of rice by-products as well)
18. Proportion of rice producers that reported reduced post-harvest losses disaggregated by gender, age and region.
19. Number of rice producers that received training targeted for the rice value chain, disaggregated by training type, gender, age and region.
20. Number of policies developed targeting the rice value chain.
21. Proportion of rice VCA accessing financial services, disaggregated by financial service type (Commercial Banks, NBFIs, MFIs and Other non-formal types like Ususu.), gender, age and region of VC actor
22. Proportion of disbursed loans that is invested in the rice - VC disaggregated by VC segment and region
23. Total volume of loans disbursed to rice VCA institutions disaggregated by region and category of the Value chain
24. Number of financial services institutions established for supporting rice value chain activities disaggregated by region and type of financial institution
25. Number of rice VCAs that benefited from the credit facility disaggregated by Value Chain segment and by region
26. Proportion of rice farmers that adopted good agricultural practices disaggregated by gender, age and region
27. Proportion of VCA that are satisfied with the quality of service provision, disaggregated by service type and by region
28. Number of PPP formed disaggregated by area of service
29. Number of trade agreements entered into for the promotion of regional and international trade