

# **NATIONAL ISSUES REPORT ON KEY SECTOR OF AGRICULTURE (ADAPTATION) IN THE GAMBIA**



*Author:* Fafanding S. Fatajo

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## Contents

Introduction.....	3
Description of the agricultural sector.....	6
Proposed adaptation measures for the agriculture sector .....	9
Key Issues in Assessing Investment and Financial Flows to Address Climate Change Adaptation in the Agriculture Sector in The Gambia .....	12
Proposed Approach/Recommendation for Conducting the Assessment of Investment and Financial Flows to Address Climate Change Adaptation in the Agriculture Sector.....	14
References.....	18

## Introduction

### Why Agriculture is a Key Sector?

Generally Gambian agriculture has been characterized by subsistence production of food crops comprising cereals (early millet, late millet, maize, sorghum, rice and findi); semi-intensive cash crop production (groundnuts, cotton, sesame and horticulture). These are the two main components that occupy agricultural activities in the country. Farmers generally practice mixed farming, although crops account for a greater portion of the production.

The Agricultural sector is characterized by little diversification, mainly subsistence rain-fed agriculture with a self-food sufficiency ratio of about 50%. The sector generates approximately 40% of the foreign exchange earnings and provides two-thirds of total household income, thus the importance of the sector in The Gambia economy. Increase in both production and area under production has the potential to reduce rural poverty, enhanced household food security, increased accumulation of capital assets by poor rural households (their human, financial, social, physical and natural assets), and more sustainable management of natural resources.<sup>1</sup>

Per capita consumption of cereals in the country is about 175kg, and that of rice alone is about 117kg. The Gambia is classified as a least Developed, Low Income Food Deficit Country and is currently ranked as 155 out of 177 countries according to UNDP's Human Development Index (HDI) for 2007. Domestic food production caters little more than 50% of the consumption requirements. A large percentage of the population lives below the poverty line and suffer from food insecurity. According to the Household Poverty Survey Report of June 2006; about 57.9% of the population lived in poverty with 39% in extreme poverty. About 46% of rural households fall below the food poverty line, compared with 15% in urban areas and 4% in the Greater Banjul Area. About 91% of the extremely poor and 72% of the poor are depending on agriculture for their survival.

Farmers tend to sell the bulk of their produces immediately after harvesting, usually at give away prices. During the 'hungry season', they buy back at exorbitant prices the very produces they sold cheaply to the local merchants. For the purchase of food items during this period, farmers may lend money from local moneylenders against their next crop income. This practice is not sustainable and takes cruel advantage of the poor rural farmers; and this may even get worst with unfavorable climate change. One of the possible solution to the above cited problem faced by farmers is to have regional (localized) cereal bank where appropriate cereal stores are constructed. The State will

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<sup>1</sup> National Agricultural Sample Survey (NASS), 2008, Department of Planning, Ministry of Agriculture.

buy cereal from the farmers and store them on their own areas, then sell them back to them during the lean period with a small mark up.

**Adaptation Needs (vis-à-vis major climate change impacts anticipated on the sector)**

The following will be some of the potential impacts of climate change impacts and adaptation needs in the country.

- Flooding/inundation of the flood plain area due among others to sea level rise which could make arable areas unproductive;
- Saline intrusion into the aquifer making the quality of underground from boreholes or livestock watering points poor;
- Saline intrusion along the length of the river due to drought or sea level rise could render most areas unproductive for rice irrigation;
- Seasonal rainfall could render harvested crops of farmers such rice, groundnuts moldy and susceptible to aflatoxin contamination and other quality deterioration;

**Table 1:** Expected Impacts and Adaptation Needs in the Country

<b>Expected Impacts</b>	<b>Adaptation Needs/Measures</b>
Inundation of flood-plain areas	Construction of embankments/dykes, relocation of threatened activities and institutional reforms
Saline intrusion into aquifers	Relocation of abstraction points, change in pumping policies of fully penetrating/deep wells/bore holes
Increased saline intrusion length	Flow regulation, licensing and permits for withdrawal of river water for irrigation
Change in river salinity	Flow regulations and policies that are to be abide by all users
Decrease in groundwater recharge	Increased water column in wells, artificial recharge/ponding
Drought Spells	Time of Planting, drought tolerant crops and use of soil moisture conservation techniques
Unseasonal rains	Construction of appropriate drying infrastructure

**Relevance from an Economic Perspective**

The Gambian economy is predominantly agrarian. The agriculture sector alone provides employment for about 75% of the labor-force, and an estimated two-thirds of total household income. These attributes make the sector a prime area for investments, if the nation’s socio-economic development policy objectives of poverty alleviation and household food security are to be realized. The sector is characterized by subsistence

rain-fed, cash and food crops production and horticulture. Agro-industrial activity is mainly limited to groundnut milling, cereal processing, cotton ginning and sesame oil extraction. Gambian agriculture is dominated by food and cash crop production (contributing 60% of agricultural GDP and 14% of national GDP). Cereal crops, mainly millet (*Pennisetum spp.*), sorghum (*Sorghum bicolor*), maize (*Zea mays*) and rice (*Oryza sativa*) account for 56% of the cultivated land. Rice is the staple food and accounts for 25-35% of total cereal production. Groundnut is the main cash crop for the farming communities, and the prime export item, comprising 74% of the agricultural export items and 38% of the Agricultural GDP (AGDP). Other cash crops are cotton (*Gossypium*), sesame (*Sesamum indicum*) and horticultural crops (which hold the greatest potential for on-farm income and export earning augmentation). The short wet season limits production to one crop per year and the main cash crop groundnut production continuously decreases over the years mainly due mainly to adverse climatic conditions.<sup>2</sup>

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<sup>2</sup> Ceessay M., Food Security Profile of The Gambia, 2007.

## Description of the agricultural sector

### Main Agricultural Production at the National and Sub-national Levels

Agricultural production in the country is highly rainfall dependent and it is a known fact that the rainfall total and distribution since the Sahelian drought of the 1970s has been erratic and grossly inadequate. This is even more pronounced during the 2006/2007 cropping season when there were some extended dry spells at the critical development stage of crop and livestock. Consequently, the situation culminated into:

- Poor agricultural performance (both crops and to some extent livestock development);
- Increased food insecurity; and
- Unprecedented household income loss

Cereal production at the regional from 2005 to 2007 is presented on Table 2 below.

**Table 2.** Total Cereal Crops: Area Planted, Yield, and Production by LGA 2005-2008

LGA/District	Total Cereal Crops											
	2005			2006			2007			2008		
	Area	Yield	Prod.	Area	Yield	Prod.	Area	Yield	Prod.	Area	Yield	Prod.
	HA	KG	Tons	HA	KG	Tons	HA	KG	Tons	HA	KG	Tons
<b>Brikama</b>	13,9	989	13,7	10,6	710	7,6	12,6	664	8,3	22,7	885	22,4
<b>Mansakonko</b>	23,5	1,2	28,8	21,8	1,08	23,5	18,8	860	16	32,7	965	33,8
<b>Kerewan</b>	59,7	1,2	66	61,9	826	51,1	58,7	746	434	56,9	982	52,3
<b>Kuntaur</b>	28,2	1,4	39,2	27,4	1,21	33,2	24,7	850	21	30,8	981	29,5
<b>Janjanbureh</b>	23,4	910	21,3	20,9	1,08	22,7	21,3	748	16	28,7	974	29,2
<b>Basse</b>	44,8	1,2	54,	40,2	1,13	45,43	50,1	893	45	61,1	996	60,1
<b>Total</b>	194	1,2	223	182,6	1,00	183,4	186	805	150	233,0	975	227,3

Source: National Agricultural Sample Survey (NASS), 2008, Department of Planning, Ministry of Agriculture.

NB: Production is a function of area x yield as clearly demonstrated above on Table 2.

As already stated above, the dry spells experienced during the 2006/2007 cropping season resulted in poor crop productivity. There has been gross reduction in the production of all major crops productivity. For instance groundnut (production) which is both a food and cash crop declined from about 82,000 tons in 2006 to 73,000 tons in 2007 representing about 11% decrease. Overall, cereals production also declined by 18 % during the corresponding period with the major decreases registered from swamp

rice (41%) and some coarse grains (average 50%) production. Only early millet production suffered minimum decline of about 17%. The cumulated poor agricultural output has serious consequences on the livelihoods of rural dwellers both in terms of household food insecurity and income loss. However, 2008 was a normal year, both area cultivated and production increased significantly.<sup>3</sup>

Owing to the poor performance of the agricultural sector in 2006 and 2007, household food insecurity has certainly increased by about 30-50% over 2006. Food crops such as cereals and groundnut constitute mainly the food basket of most Gambians and any severe decline in the production of these basic food commodities (the auto-consumption of which is about 60-70%) will have serious impact on the food security level of rural households and even those in the urban areas. The lean period which in a normal year is between July to August was aggravated by the acute shortage of household income to purchase food for the family.<sup>4</sup>

Taking into account 53% of groundnut production loss, rural incomes will seriously decline by more than 50% in 2008. This will further erode the livelihood standards of the entire farming community whose welfare largely depends on farm income. This may culminate into increased poverty levels among the affected population.

The total cereal production available for consumption is estimated at 337,894 metric tons, out of which 100,564 metric tons is composed of food imports and food aid of mainly rice and 237,330 metric tons consist of coarse grain cereals of farms production and carry over stock from 2006/2007 commercial imports of rice.

Fruit tree production and harvesting at regional level is presented on Table 3 below.

**Table 3.** Number of Household Harvesting Tree Crops By LGA in 2006/2007<sup>5</sup>

LGA	Name of Tree Crops							
	Number Of Holders							
	Cashew	Coconut	Banana	Mangoes	Oranges	Guava	Papaya	Total
<b>Brikama</b>	20,530	3917	4492	24569	14256	4652	3245	26,024

<sup>3</sup> National Agricultural Sample Survey (NASS), 2008, Department of Planning, Ministry of Agriculture.

<sup>4</sup> National Agricultural Sample Survey (NASS), 2007, Department of Planning, Ministry of Agriculture.

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<b>Mansakonko</b>	1,131	296	3230	5215	1142	660	1596	5,137
<b>Kerewan</b>	1,005	-	4359	7485	1114	885	1696	12,409
<b>Kuntaur</b>	470	-	938	3146	355	1156	2506	5,278
<b>Janjanbureh</b>	435	456	817	1896	601	2849	272	7,632
<b>Basse</b>	3,399	-	4113	5169	965	13290	1035	19,126
<b>Total</b>	26,969	4,669	17,949	47,480	18,433	23,492	10,350	75,589

*Source:* National Agricultural Sample Survey (NASS), 2007, Department of Planning, Ministry of Agriculture.



## **Proposed adaptation measures for the agriculture sector**

The policy framework for climate change is encapsulated in the National Adaptation Plan of Action (NAPA) which addresses the impact climate change at national and local levels. The principal goal of the NAPA is to identify priority adaptation activities. Specifically, it seeks to understand the main characteristics of climate hazards; coping mechanisms and climate change at local and national levels; understand existing programmes and institutional arrangements for addressing climate change and identify and prioritise activities to climate change.

The policy focuses on country level adaptations and was arrived at the following participatory processes with the active involvement of all stakeholders. It is pivoted on the Poverty Reduction Strategy II, The Millennium Development Goals and multilateral agreements and conventions including those of the United Nations Convention to Combat Desertification (UNCCD).

### **Climate Change Adaptation Measures in The Gambia**

Measures on adaptation to climate change occur at two principal levels: local and national levels as detailed below.

#### **Local level Adaptation Measures**

##### *Technology Options*

- Restructure present irrigation system through the use of sprinkler and drip irrigation;
- Select drought, pest and disease, weed, salinity resistant and high yielding crop varieties for the local conditions. For this purpose the genetic potential of local crop species must be investigated and specimens stored in seed banks;
- Enhance and maintain soil fertility, to improve the economic water consumption for agriculture;
- Change planting dates and replace long duration upland & lowland crop varieties for short duration varieties;
- Introduce and promote integrated agricultural management system, which will provide the improvement and application of innovative agricultural technologies that will increase the efficiency of agriculture;
- Develop early warning system to inform farmers and other stakeholders on possible climate change and its impact on agriculture and to sensitize them in order to be ready to implement the adaptation measures;
- Introduce, promote and encourage the adoption and diffusion of improved post harvest technologies that will reduce post-harvest losses in the field and in storage. This will have the long-term effect of reducing extensive cultivation of marginal lands;

- Crop and livestock (including poultry) diversification;
- Shifting production between crops and livestock;
- Engage in hired labor and off-farm work for the farmers to generate additional income;
- Reduce post harvest losses of food crops;
- Improve the value-added, preserve the nutritive value and extend the shelf-life of the common food stuffs through hygienic food processing;
- Consumption of forest products such as fruits, leaves, roots and game;

#### *Regulatory Initiatives*

- Discourage producing on marginal areas;
- Establish Community Forestry and manage it well and eco-tourism to generate income for community and individual households;
- Reduced rice consumption as staple food by eating other nutritive cereals;
- Storage of surplus harvest at household and community levels e.g. cereal banks;
- Reduce cooked food wastage;
- Diversify eating habit (change from rice to other cereals-implications are many).

#### **Expansion and Intensification of Agro-forestry and Re-forestation The following are to be conducted by NARI and Department of Forestry for sustained adaptation**

- Improve and maintain forest resources including their contribution to the global carbon cycles through the promotion and adoption of appropriate agro-forestry systems and re-forestation including enrichment planting of the existing forest reserves;
- Maintain the health, vitality and integrity of forest and woodland ecosystems through enrichment planting with suitably identified plant species;
- Maintain and improve the productive functions of forest and woodland ecosystems through enrichment planting of selected tree species for the purpose;
- Improve and maintain the biological diversity in forest and woodland ecosystems through enrichment planting of agro-forest and forest areas and reduction of occurrence of bushfire;
- Minimize soil desiccation and soil movement caused by water and wind erosion thus reducing soil degradation thereby enhancing land productivity and sustenance of adequate level of agricultural production;
- Establishment of nurseries for the production of multipurpose tree species domestication seedlings and re-forestation seedlings;
- Training of villagers in tree nursery production, budding and grafting techniques, methods of transplanting tree seedlings and forestry management principles;

- Provision of wells fitted with appropriate water lifting devices at the regional and/or community level nurseries;
- Surveying and demarcation of the target forests to establish the extent of the forest covers in question and determine their boundaries for protection against illegal encroachment;
- Establish a Project Management Unit in the Policy Focal line Department of State for UNFCCC to assume the day-to-day operational management of all the priority interventions to adapt to climate change;
- Equipping each of the participating communities/villages with patrol and bushfire fighting equipment.

# **Key Issues in Assessing Investment and Financial Flows to Address Climate Change Adaptation in the Agriculture Sector in The Gambia**

## **Data Availability and Other Relevant Information Constraints**

Let me first of all say that, there are lot of data available on agriculture, but the system is weak and has the need to be strengthened. Agriculture has ever been depending on climate, however, investment in climate related issues are new phenomena and cannot certainly be undertaken by the private sector. The private sector (in The Gambia like many developing economies) is profit oriented and any investment activity or project whose Internal Rate of Return (IRR) is not more than the cost of lending is unlikely to be welcomed.

Certainly since it is fairly the newest area in development arena, just like the HIV/AIDS was in the late 1990s to mid 2000; most of the literatures on investment in the area originate from the First and Second National Communications of The Republic of The Gambia. As the Director of the Department responsible for agriculture surveys and data in general in agriculture; accurate and reliable data on most things in the country is really a big hustle. There are lots of data collections, surveys been conducted in the country, but they are not coordinated and the data are scattered, and sometime just raw not even analyzed for public consumption or gathering dust somewhere. Most of the data are generated through projects where they are only generated to meet the project objectives. In the public domain, most of the data collected are confronted with lots of constraints as if collecting data is not one of the national priorities, and most cases, if not all cases, there is no budget line for data collection to be used by policy and decision makers in the country. In short data collection is expensive and requires lots of both human and financial resources which are not always available in the country.

## **Proposed Methodological Approach for the Sector**

Below are the commonly used methodologies in data collection in the country, and the existing data were collected using one of them:

- Census (no exception/entire population);
- Surveys (opened-ended questionnaires);
- Rapid Rural Appraisal (RRA), usually check list is used to guide the discussions;
- Participatory Rural Appraisal (PRA), usually check list is used to guide the discussions;
- Participatory Learning Appraisal (PLA), usually check list is used to guide the discussions.

Census are rarely use in data generation in the country. It is done in every ten years where every single interlocutor is counted. Census is very expensive as such cannot be undertaken by private sector for whatever reasons. On the other hand a survey is frequently conducted and can be undertaken by any institution to meet its objectives. Survey takes sample of the population and the larger the sample size the bigger the survey. A survey can be conducted using simple random selection, purposively sampling, snow balling among others. Data are collected based on the objective(s) and or functions of the collecting institutions/departments/organizations.

The data will be processed using Spread Sheet and SPSS to make an in-depth analysis of the existing data and give meaning to them.

**Table:** Historical data

<b>Indicator</b>	<b>Institution (s) Responsible</b>	<b>Costs</b>
Area, Yield and Production	Department of Planning (DOP)	Variable and fixed costs
Area /range, yield and production	DOP, Department of Livestock (DLS) and National Agricultural Research Institute (NARI)	Variable and fixed costs
Head count and species, Mortality, morbidity and off take rate	DOP/DLS	Variable and fixed costs
Threshing /dehulling /milling /paste /jam /juice	National Food Processor Association, Department of Food and Nutrition, DOP	Variable and fixed costs

### **Modelling and Scenario Limitations and/or Assumptions**

- First and foremost, there is training need for modeling in the country;
- There is no country specific data on the issue;
- No survey has been carried out on the issue to establish a trend that will be usable with limited bias, more surveys should be conducted to establish a trend;
- Regional or sub regional data sometimes do not reflect reality on the ground
- Requires complex models/scenarios to be able to analyze models such as SAM, etc.

# **Proposed Approach/Recommendation for Conducting the Assessment of Investment and Financial Flows to Address Climate Change Adaptation in the Agriculture Sector**

## **Institutional Arrangements**

Despite of the fact that, there is a department responsible for issues related to climate (focal department, which is Department of Water Resources), it does not have the capacity to handle issues related to agriculture. This is why you have other institutions such as Ministry of Agriculture (MOA), Ministry Health and Social Welfare, Ministry of Forestry and Environment,, and Ministry of Energy preparing Thematic Issue Papers. However, Department of Water Resources is the UNFCCC Focal Department in the country and by default should be the one coordinating all activities related to climate. The Department of Water Resources has been coordinating this and should continue that wonderful coordination as usual in collaboration with the ministries mentioned above.

## **Stakeholders and Co-ordination Scheme**

Every department of state has specific functions to perform in order to meet its objectives in the country. However, as already been highlighted in 5.1 above, Department of Water Resources by default is the focal department to coordinates all related activities in collaboration with Ministry of Agriculture, Ministry of Finance and Economic Affairs, Ministry of Trade Industry and Employment, Gambia Investment Project for Zone Areas and Gambia Chamber of Commerce.

## **National Sources of Finance and Investment for the Agriculture Sector**

For viable investment in the country, there are not many options to finance investment in the agriculture sector. This is also based on the level of economic activities, and that of The Gambian Economy is based mainly on agriculture. Below are some of the investment options available in the country.

- Government of The Gambia (GOTG);
- Bilateral such as ROC, EC/EU, US Embassy, Iran, Venezuela, Spain, Kuwait, Kingdom of Saudi Arabia, British High Commission;
- Multi-lateral Cooperation, such as the UN System (UNDP, FAO etc.);
- Private Commercial Producers;
- NGO.

Below is the proposed draft work plan for the assessment in the country provided resources are available to the implementer.

Activity/Period	Month (September 2009 to May 2010)								Responsibility
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
Work plan preparation and finalization									Technical Group (TG) and Team Leader (TL)
Distribution of Assignments in the Work Plan									TL
Identify the scope for the livestock subsector									TL and TG
Participation at COP 15									TL
Establish key parameters									TL and TG
Compile relevant historical, current and projection data (5 years before 2005)									TL and TG
Define a baseline scenario in year 2005									TL and TG
Assess existing data and identify data gaps for I&FF									TL and TG
Estimate I&FF and O&M costs under the baseline									TL and TG
Define adaptation scenario									TL and TG
Estimate I&FF and O&M costs under the adaptation scenario									TL and TG
Estimate changes in I&FF and O&M costs to implement									TL and TG
Evaluate the policy implications									TL and TG
Drafting the Report									TL and TG
Circulate Draft to Team members for comments									TL
Finalise the report and incorporate comments									TL and TG
Presentation at a workshop for briefing Policy makers									TL
Report distribution, storage/archiving									TL

## The Way Forward for Adaptation in Agriculture

There is much evidence to suggest that global climate change would adversely affect agricultural productivity in The Gambia; our country does not have the financial resources to invest in research programs and technologies that could help its producers adapt to changes immediately. Genetic engineering, for example, could be used to develop crops that would flourish in any climate, but the question is both financial and human resources to deal with the anticipated climate change. If do not set the ball rolling now, our poorer farmers would not be able to adjust planting dates, crop varieties, and use more chemicals.

Total agricultural land for The Gambia is put at 1,036,534 ha classified according to suitability. There about 550,000 ha are considered suitable for agricultural production, and a similar hectrage is also available with some development. Crop production in the country could use less area and have surplus for export, provided that the adaptation suggestion presented above are adhered to. This does not mean expanding in the area under cultivation, but rather improve productivity (5 mt/ha) as opposed to the current rate of productivity (0.8mt/ha), and produce atleast two times in a year. Table below is based on the following assumptions:<sup>6</sup>

- Proper and appropriate irrigation system for all the crops;
- Research recommendations (seed rates, fertilizer rate and time of planting) are followed;
- Minimum yield per hectare will be 5 mt;
- Minimum production will be two times in a year (10mt);
- Change from paddy to cleaned rice is about 65%;
- Post harvest losses will be insignificant;
- Population at 2009 is 1,360,681(baseline);
- Population growth is 2.7, and will maintain this for the period;
- Per capita consumption of rice is about 160,000mt;
- Per capita consumption of other cereals is about 80,000mt;
- Area cultivated under other cereals in 2009 was about 169,594ha;
- Production under other cereals in 2009 was 191,971 mt;
- Area cultivated under rice in 2009 was about 34,000ha;
- Rice production in 2009 was 33,300 mt.

**Table 4.** Population projection (1000000) and Production (1000mt) of Cereals from 2009-2015 in The Gambia<sup>7</sup>

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<sup>6</sup> The Gambia: Food Crisis Response Program, 2008.

<sup>7</sup> Ceesay M., Food Security Profile of The Gambia, 2007.



Crop	2009		2010		2011		2012		2013		2014		2015	
	Pop.	Prod	Pop.	Prod	Pop.	Prod	Pop.	Prod	Pop.	Prod	Pop.	Prod	Pop.	Prod
Coarse Grain	1.36	192	1.40	1700	1.44	1700	1.48	1700	1.52	1700	1.56	1700	1.60	1700
Paddy		33		340		340		340		340		340		

Going by the figures on Table 4 above, indicate that agriculture activities could either maintain the present area under production for all the cereals or be able to feed the country and have surplus for either export and or other domestic uses. The rest of the vast area (>65% of the total arable land) in the country could be for other adaptation and or mitigation activities.<sup>8</sup>

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<sup>8</sup> Ceesay M., Food Security Profile of The Gambia, 2007.

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