NO.

JAPAN INTERNATIONAL COOPERATION AGENCY

DEPARTMENT OF STATE FOR AGRICULTURE
THE REPUBLIC OF THE GAMBIA

THE STUDY ON AGRICULTURE AND RURAL DEVELOPMENT IN THE UPPER RIVER DIVISION, THE REPUBLIC OF THE GAMBIA

FINAL REPORT
MAIN REPORT

JANUARY 2006

TAIYO CONSULTANTS CO., LTD.
PACIFIC CONSULTANTS INTERNATIONAL

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Currency Exchange Rate

	GMD	US$	¥
GMD	1.00	0.0358	4.22
US$	27.9	1.00	117.77
¥	0.237	0.0085	1.00

(As of November 2005)

PREFACE

In response to a request from the Government of The Gambia, the Government of Japan decided to conduct a study on Agriculture and Rural Development in Upper River Division, the Republic of The Gambia and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA selected and dispatched a study team headed by Mr. Shiro HIRATA of Taiyo Consultants Co., Ltd. and consisting of Taiyo Consultants Co., Ltd. and Pacific Consultants International Co., Ltd. between February, 2003 and January, 2006.

The team held discussions with the officials concerned of the Government of The Gambia and conducted field surveys at the study area. Upon returning to Japan, the team conducted further studies and prepared this final report.

I hope that this report will contribute to the promotion of this project and to the enhancement of friendly relationship between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of The Gambia for their close cooperation extended to the study.

January 2006

Etsuo KITAHARA,
Deputy Vice President
Japan International Cooperation Agency

Tokyo, January 2006

Mr. Etsuo Kitahara
Vice-President
Japan International Cooperation Agency
Tokyo, JAPAN

LETTER OF TRANSMITTAL

Dear Sir,

We are pleased to submit the Final Report on "Agriculture and Rural Development Study in the Upper River Division, The Republic of The Gambia". This report presents the results of all the works performed in both The Gambia and Japan during a total period of 35 months from February 2003 to January 2006.

During the Study period, we have verified the efficiency and relevance of the Agriculture and Rural Development Plan by implementing some project components proposed in the Plan. Some components were partly revised based on the lessons learnt from the project implementation.

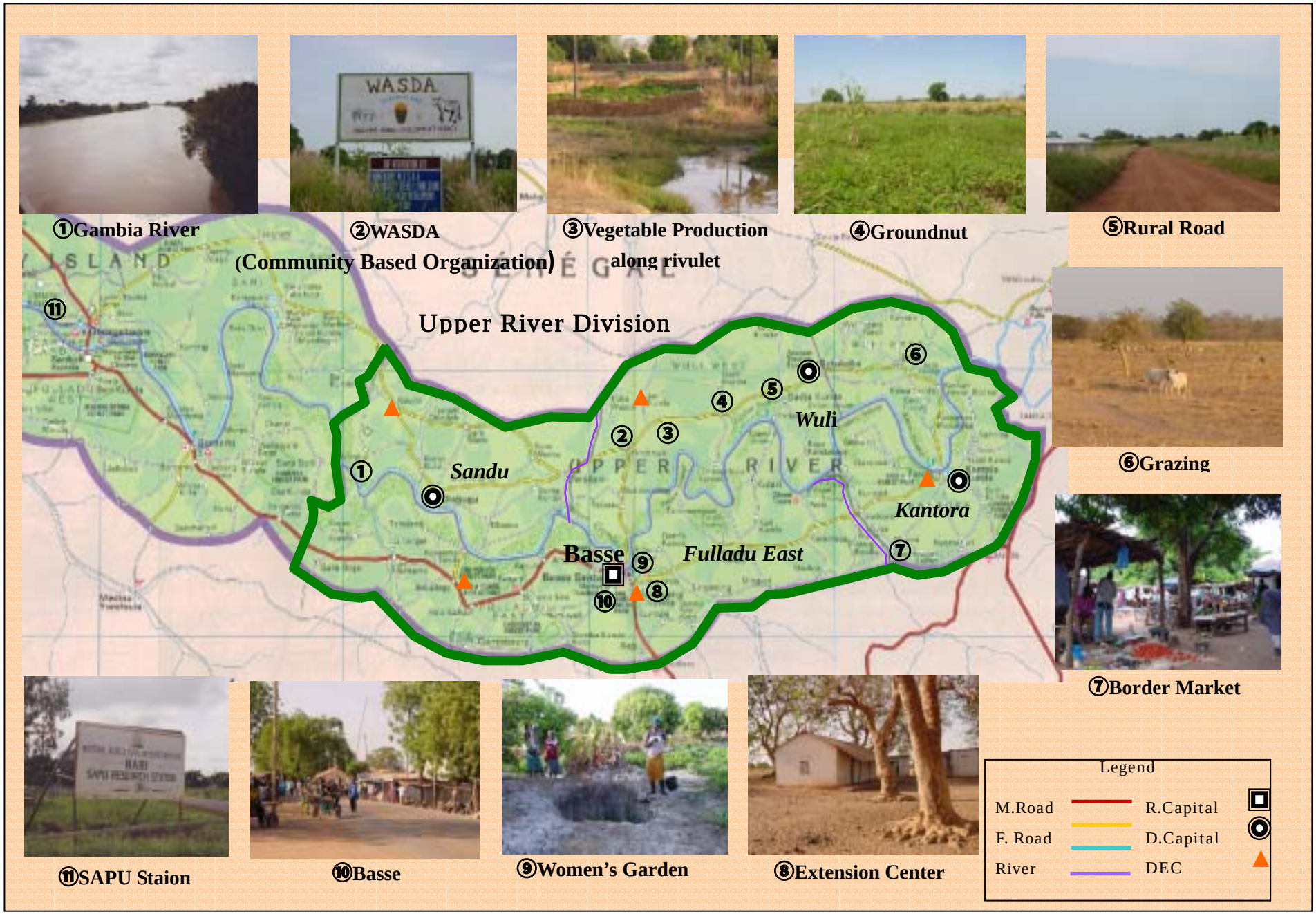
Almost all the projects proposed in the Plan are small scale, and therefore they can be implemented at relatively low cost, since we have put more importance on project implementation at local level, including community level. The manual of project implementation was also developed simultaneously in order to promote effective use of the Plan by the organizations including Divisional Agriculture Office and Livestock Office, Area Council, NGO, CBO and so forth. Their passion towards the project implementation is so strong that some actions have already been taken through their own initiative. We sincerely hope that the report and the manual are broadly used and contribute for the development of the farmers in the Division and subsequently contribute to poverty reduction in the area.

We wish to express our deep appreciation and sincere gratitude to the officials concerned of your Agency and the members of the Advisory team for the courtesies and cooperation kindly extended to our Study Team. We also wish to express our hearty appreciation and gratitude to the Authorities concerned of the Government of The Gambia, such as the Department of State for Agriculture, URD Commissioner's Office and Basse Area Council, as well as the officials concerned of your Agency in Senegal and the Embassy of Japan for the close cooperation and assistance extended to our Study Team during the field surveys and studies in The Gambia.

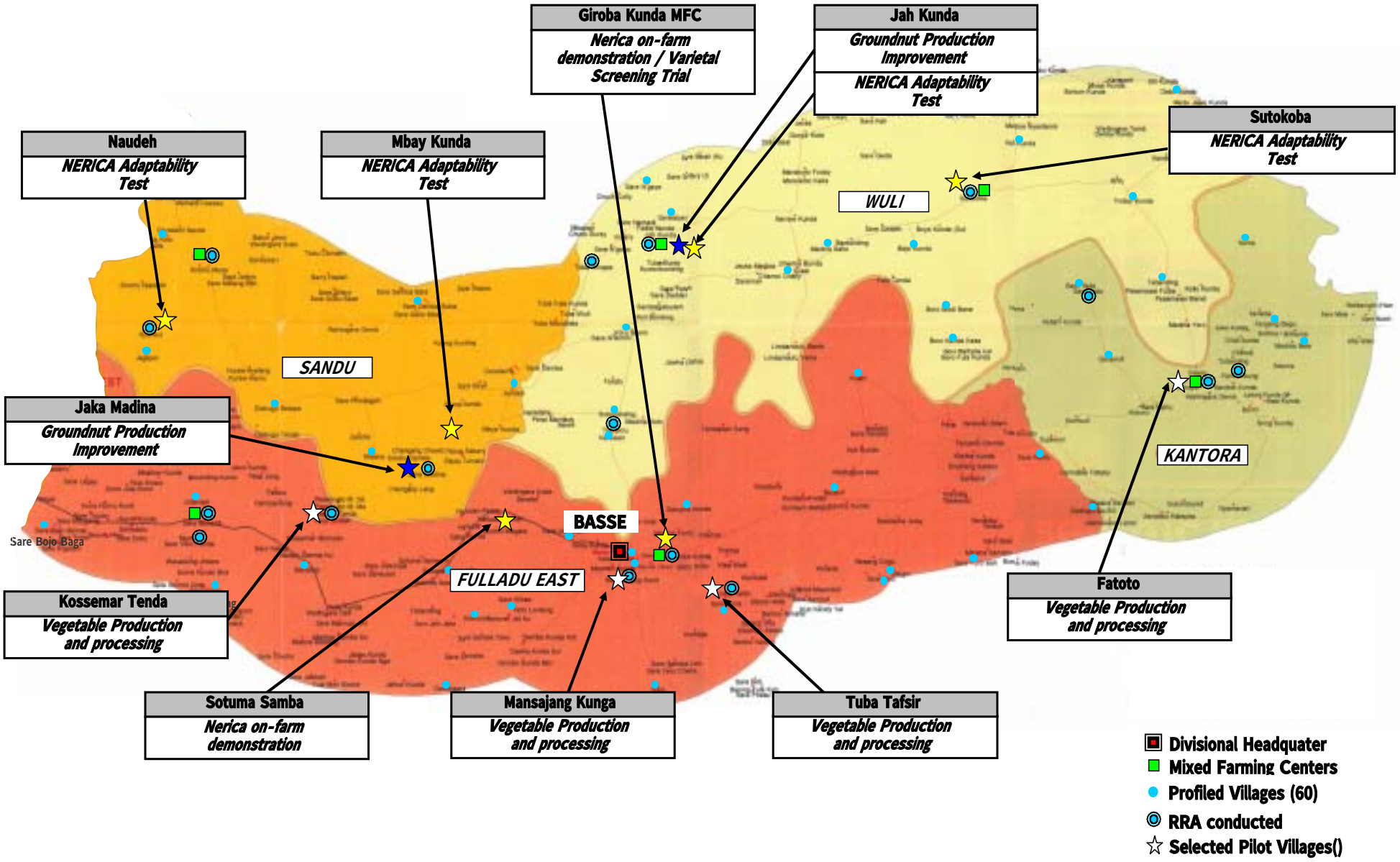
Very truly yours,

Shiro Hirata
Team Leader
The Study Team of Agriculture and Rural Development in the Upper River Division, The Republic of The Gambia

Location Map of the Study Area



General Situation of URD



Location of Verification Project Sites

LIST OF ABBREVIATIONS

ADB	:	African Development Bank
AFET	:	Association of Farmers, Educators and Traders
ANR	:	Agriculture and Natural Resources
ATM	:	Agricultural Taiwanese Mission
CAP	:	Community Action Plan
CBO	:	Community-Based Organization
CDO	:	Community Development Officer
CPMS	:	Crop Produce Marketing Societies
CRD	:	Central River Division
D/GMD	:	Gambian Dalasi
DAC	:	Divisional Agricultural Coordinator
DAO	:	Divisional Agricultural Office
DAS	:	Department of Agricultural Services
DCC	:	Divisional Coordinating Committee
DCD	:	Department of Community Development
DCO	:	Divisional Cooperative Officer
DDC	:	District Development Committee
DEC	:	District Extension Centre
DES	:	District Extension Supervisor
DLO	:	Divisional Livestock Officer
DLS	:	Department of Livestock Services
DOCD	:	Department of Cooperative Development
DOP	:	Department of Planning
DOSA	:	Department of State for Agriculture
FAO	:	Food and Agricultural Organization
FASE	:	Fight Against Social Exclusion
GDP	:	Gross Domestic Product
ha	:	Hectare
JICA	:	Japan International Cooperation Agency
LA	:	Livestock Assistant
LADEP	:	Lowland Agricultural Development Programme
LRD	:	Lower River Division
MDFT	:	Multi-Disciplinary Facilitation Team
MFC	:	Mixed Farming Center
NARI	:	National Agricultural Research Institute
NERICA	:	New Rice for Africa
NGO	:	Non-Governmental Organization
PER	:	Public Expenditure Review
PMU	:	Project Management Unit
PRSP	:	Poverty Reduction Strategy Paper
PVS	:	Participatory Varietal Selection
SDF	:	Social Development Fund
SDRD	:	The Support to Decentralized Rural Development
SMS	:	Subject Matter Specialist
SPA II	:	Strategy for Poverty Alleviation II
TAC	:	Technical Advisory Committee
UNDP	:	United Nations Development Programme
URD	:	Upper River Division
VDC	:	Village Development Committee
VEW	:	Village Extension Worker
VSO	:	Voluntary Service Overseas
WAD	:	Wuli Association for Development
WARDA	:	West African Rice Development Association
WASDA	:	Wuli and Sandu Development Association

SUMMARY

I Background and Objectives of the Study

1. This report on the 'The Study on Agriculture and Rural Development in the Upper River Division, the Republic of The Gambia' was prepared based on the Scope of Works (S/W) signed between the Japan International Cooperation Agency (JICA) and the Department of State for Agriculture (DOSA) of the Government of the Gambia on August 20, 2002. The Study was carried out from February 2003 to November 2005, and the Master Plan was formulated after analyzing the existing conditions, constraints and potentials of development, based on the field survey carried out in the Study Area *(Chapter 1.1)*.

2. The Republic of The Gambia is surrounded by Senegal on all the three sides (east, south and north) except on the Atlantic coastline. With an area of 11,295km^2, it is one of the smallest countries in Africa. With a population of about 1.4 million and a growth rate of 2.8 percent (Provisional 2003 Census Results), The Gambia has one of the highest population densities in Africa. The Study Area, which is Upper River Division (URD) is located in the far eastern part of The Gambia and is situated at a distance of about 350 km from the Capital, Banjul. The Gambia river runs through the centre of URD from east to west. URD is generally characterized by low-lying flat land and the difference of altitude rarely exceeds 45 m. The topography of the Study Area is gently inclined towards the Gambia River *(Chapter 1.1)*.

3. The objectives of the Study are as follows *(Chapter 1.2):*
   (1) to formulate a Master Plan for agriculture and rural development in URD contributing to the improvement of rural livelihood and household income based on agricultural activities;
   (2) to carry out technology transfer to the Gambian counterpart personnel through capacity building; and,
   (3) to carry out technology transfer to local people in the targeted area through the implementation of Verification Projects.

4. The overall goal of the Master Plan is to achieve an affluent rural area through the improvement of rural livelihoods and household incomes. Capacity building to enable the counterpart personnel to promote and disseminate improved technology (agronomy, animal husbandry and agriculture related activities) to farmers and to enable the local people to manage the projects by themselves were also stressed *(Chapter 1.2)*.

II Agriculture and Decentralization in The Gambia

5. The Gambian Government has formulated the Draft Agriculture and Natural Resources Sector Policy 2001 - 2020 and the key thrust of this policy focuses on the following strategic objectives *(Chapter 2.2):*

- To achieve national food security and curtail the importation of basic foods;
- To increase overall sector output particularly of domestic food and export products through production and productivity enhancement;
- To create employment and generate income for the majority of the rural population;
- To diversify the production base to facilitate the production of a wide range of food and export crops in order to reduce the fluctuations and uncertainties in household income and export earnings;
- To reduce disparities between rural-urban as well as between men and women, curb the rural-urban drift and accelerate the pace of development of the rural sector;
- To provide effective linkages with other sectors of the economy so as to enhance mutual benefits complementarily and supplementarily on a sustainable basis;
- To ensure the judicious and sustainable exploitation of the country's natural resource base so as to conserve and improve biodiversity and to enhance the productivity in consistent with consideration of the needs and rights of future generations; and,
- To promote private sector-led growth and enhance capacity of producer organizations.

6. As a long-term framework for development the 'Vision 2020' was formulated in 1996, in which the country is envisioned to be transformed into a middle income country from a low income country *(Chapter 2.2).*

7. Poverty alleviation mainly targeting rural residence is central to national policies. The main objective of The Gambian PRSP is to promote growth and employment and, the PRSP has the following 5 main pillars: 1) creating an enabling environment to promote economic growth and poverty reduction; 2) enhancing the productive capacities and social protection of the poor and vulnerable population; 3) improving coverage of basic social service needs of the poor and vulnerable population; 4) capacity building of local communities and civil society organizations to play an active role in the development process; and 5) mainstreaming gender equity, environmental issues, nutrition and HIV/AIDS into all development programmes *(Chapter 2.2).*

8. Under the Reform of the Local Government System and the Decentralization policy, the Local Government Act, 2002 was enacted which aims at the transfer of agricultural services to Councils i.e. the establishment of Department of Agriculture and Livestock Services in each Council and the transfer of Government personnel including those in agriculture and natural resources to Councils. The transfer shall be done gradually considering the capacity of Councils *(Chapter 2.5).*

III Existing Conditions of the Study Area

9. In the Study Area, the average maximum temperature is moderate (25-32^{o}C) throughout the year, except just prior to the rains in April/May, when the average temperature rises to a little over 40^{o}C. The rainfall is concentrated during the rainy season which lasts from June to October. The current annual average rainfall is 800 mm which is about 20-30% lower than the rainfall in the past 50 years. In the year 2002, the rainfall during June to August was too low resulting in a reduction of 60-90% of the production. On the other hand,, there was heavy rainfall in August 2003, which led to crop injury and damage, especially in the low lying swampy areas. The soils in the Upper River Division are mostly sandy, and have conditions similar to most parts of The Gambia. The fertility status of the soils is usually low, with a low level of organic matter, and total nitrogen and a low nutrient holding capacity (Chapter 3.1.1 – 3.1.5).

10. In the Study Area, about 50% is covered with trees and shrub savanna and the total cultivated area is 24% *(Chapter 3.1.6).*

11. URD is divided administratively into 4 districts and 14 wards. Villages are the smallest administrative units under the wards, and there are 377 of them in URD. According to the 2003 census data released by the Department of Central Statistics, URD has a population of 183,033 and 8,156 households. In comparison with the 1993 population of 155,059, it has increased by about 20% in the last decade (Chapter 3.2.1).

12. As a more modern organization, almost all villages have Village Development Committees (VDC). The organizations of VDC have been spearheaded by the Department of Community Development (DCD) and funded by the European Union, as a part of the process of decentralization. The committees were first introduced in the 1980s, but did not function effectively. They however, have an important role in village development, and are the first

contact point for external organizations. The Ward Development Committees (WDC) are the next organizational level above VDCs. These committees comprise of a cluster of villages with membership drawn from two representatives from each village *(Chapter 3.2.4).*

13. In the Study Area, most of the public agricultural services are carried out by the Divisional Agricultural Office (DAO) under the Department of Agricultural Services, and Divisional Livestock Office under the Department of Livestock Services. The DAC, head of DAO, is assisted by an Assistant DAC and 4 Special Matter Specialists (SMSs : Crops, Vegetables, Soil and Water management, and Crop Protection). The office also houses the Agricultural Mechanization Unit (AMU) and has 4 volunteers. The extension activities are carried out at six centers including one sub-branch, each with 1-2 VEWs, under the supervision of the DAO. The routine work of the Village Extension Worker is to visit and carry out agricultural extension activities in many villages. They also work as members of the Multi Disciplinary Facilitation Team (MDFT) at the Ward level *(Chapter 3.3).*

14. In The Gambia, groups of women carry out vegetable production in small independent plots in communal gardens. The main production areas for vegetable are the Western Division and North Bank Divisions where climatic conditions are most favorable. Vegetable production in URD is generally carried out by women in two different types of gardens, including kafo vegetable garden which constitute the majority of the gardens with hand-dug wells (about 8 meter deep or more) and private gardens with hand-dug wells (less than 2 meters). A range of vegetables including onions, tomatoes, cabbages, egg-plants, okras, peppers and bitter tomatoes are grown in these gardens *(Chapter 3.4.2).*

15. According to the last Agricultural Census (2001/2002), the primary occupation of more than 90% of the residents in URD is agriculture. The specific characteristics of this agriculture comprise growing various kinds of crops, and subsistence farming based on rainfed agriculture. *(Chapter 3.4.4).*

16. In the Study Area, groundnut is cultivated in 45% of the area, followed by millet and sorghum which occupy 43% of *the area(Chapter 3.4.4).*

IV. Development Constraints and Potentials

17. Based on the review and analysis of existing literature and existing projects, interviews with related stakeholders, workshops at the village level, and field surveys, a preliminary

examination was carried out on the constraints and potentials of the Study Area from a "Five Capitals" perspective, including social capital, natural capital, human capital, financial capital and physical capital. Social capital concerns human relationship, reliance, etc. and human capital consists of people's knowledge, skills and motivation. Nature capital refers to the forest, minerals and animal resources. Financial capital represents access to credit etc. and physical capital refers to physical means of livelihood such as roads, factories, equipments and other assets *(Chapter 4.1).*

18. The main constraints of agricultural development in the Study Area are as follows *(Chapter 4.3):*
    (1) low soil fertility and agricultural productivity resulting from
        - irregular rainfall;
        - limited access to farm inputs and implements;
        - lack of information for improved cultural practices; and,
        - unsuited land tenure system.
    (2) lack of markets;
    (3) heavy work load on women.;
    (4) inefficient provision of agricultural support services; and,
    (5) unsustainability of investments after the withdrawal of donor assistance.

19. The potentials of agricultural development in the Study Area are as follows *(Chapter 4.4):*
    (1) There are 3 levels of committees already set up in the Study Area including Village Development Committee (VDC), Ward Development Committee (WDC) and Divisional Coordinating Committee (DCC).
    (2) Multi Disciplinary Facilitation Team (MDFT) and Department of Community Development (DCD) are operating in order to promote community based activities.
    (3) The various development activities and programs carried out in the Study Area by various development partners are as follows:
        ① Support to Decentralized Rural Development (SDRD) by EU;
        ② Social Development Fund (SDF) by AfDB/IFAD;
        ③ Fight Against Social and Economic Exclusion (FASE) by UNDP;
        ④ Voluntary Service Overseas (VSO), supporting CBOs;
        ⑤ Low Land Agricultural Development Programme（LADEP）by AfDB/IFAD; and,
        ⑥ Participatory Integrated Watershed Management Project (PIWAMP) by AfDB/IFAD.
    (4) Although there are difficulties in undertaking irrigated rice farming, traditional upland

rice and lowland rice cultivation are carried out in the Study Area, and there are high expectations for the introduction of new rice varieties.

(5) There is possibility of integrated agriculture and livestock farming both at the farmer level and at the village level.

V. Master Plan

20. The Master Plan aims to direct development efforts ultimately, i.e. food security and poverty alleviation, in tandem with the country's long-term strategy for sustained development. sustaining livelihood of poor farmers, particularly women, through the enhancement of agricultural productivity and production will be emphasized in the Master Plan. It should therefore be viable financially, technically and be socially acceptable *(Chapter 5.1)*.

21. The Master Plan is geared towards agriculture and rural development in URD. However, given that several aspects of rural development including capacity development of both community and local government for participatory development, have been promoted and implemented under several projects and programmes, the Plan focuses more on agricultural development through strengthening of community and public sector roles. *(Chapter 5.2)*.

22. The development plan should focus on improving the income of the rural population. While placing importance on the above mentioned items, the development strategy should focus on the following 4 programs *(Chapter 5.4)*.

(1) Program Strategy

The programs of the Master Plan were selected based on the analysis of the natural, and socioeconomic conditions of URD. The constraints and potentials of URD identified from the preliminary examination of the five capitals in rural areas were carefully reviewed and development programmes that could address and capitalize on these were formulated, namely: A) Livelihood Improvement Programme; B) Improvement of Living Conditions Programme; C) Technical Support Service Strengthening Programme; and, D) Capacity Building Programme for Communities.

A) Livelihood Improvement Programme

Objective: Concerning upland crops, vegetables, rice and livestock, which are important sources of livelihood in the Study Area, the utilization of local resources, traditional skills and techniques are to be reviewed and improved techniques are to be introduced with the

aim of stabilizing and reinforcing these sources of livelihood. It is important for farmers to shift from dependency on groundnut cultivation and diversify their crop mix. This program emphasises vegetable and rice production. Given that lowland rice interventions have recently been implemented by LADEP with support from IFAD/ADB, this programme will lay emphasis on promotion of upland rice by assisting and strengthening rice farmers' organizations amongst others.

B) Improvement of Living Conditions Programme

Objective: Improvement of food security within villages and households (through small-scale food processing, seed banks), and mitigation of labour burden and drudgery on women. A range of activities, including promotion of vegetable production, compost making and production of processed goods, will be carried out in an integrated manner, mainly targeting women's groups.

C) Technical Support Service Strengthening Programme

Objective: Agricultural extension services in the study area generally experience limited liaison and coordination between government extension organizations, donors and NGOs. This programme aims to strengthen technical support to farmers, prepare a database of agriculture-related information, and build the coordination skills capacity of the Divisional Agriculture Coordinator (DAC) and Divisional Livestock Officer (DLO) and their staff.

D) Capability Building Programme for Communities

Objective: The lessons of community-based projects have revealed several problems, including a lack of beneficiary ownership of the projects, a lack of problem-solving ability, and a culture of dependency. Based on those lessons, this programme will provide technical training for actions that beneficiaries should take to maintain sustainable livelihoods.

(2) Technical Strategy by Sub Sector Intervention Area

In line with the ANR sector policy and the above mentioned programme strategies, the development plan will focus on areas such as field crops, vegetables, livestock and NERICA as priority intervention areas in terms of the agricultural sub-sector.

23. Following from the Programme and Technical strategies as well as lessons learned through the implementation of the verification project, 19 components were finally identified in the Study in order to achieve the goal of the Master Plan. There are four categories in which the highlighted and integrated programmes are fitted. The first programme, A) Livelihood

Improvement programme comprises of nine project components, mainly targeting farmers' agricultural activities. The second one, B) Improvement of Living Condition Programme consists of three project components, main target of which are also the farmers. The third one, C) Technical Support Service Strengthening Programme has five components. These are meant for capacity building of the department staff which ultimately should result in betterment of communities' livelihood. Finally, the last programme, D) Capacity Building Programme for Communities comprises two project components aimed directly at the communities. In order to enhance usability of the Master Plan, the Description not only shows a menu of project components, but also presents the details of each project by mentioning project schedule, necessary inputs, project cost and so forth *(Chapter 5.5).*

The 19 projects emanating from the 4 programmes are listed below:

A-1. Farming Practice Improvement Project;
A-2. Seed Replacement Project;
A-3.Strengthening Rice Growers Association;
A-4.Promotion of NERICA;
A-5.Study on Pre- and Post-Harvest on Rice Sector;
A-6.Compost Farming Project;
A-7.Fodder Production around Household Project;
A-8.Improvement of Small Ruminant Production;
A-9.Animal Traction for Women;
B-10.Small Scale Food Processing/Preservation;
B-11.Cereal Bank Management;
B-12.Introduction of Labour Saving Devices for Women;
C-13.Resource Mapping for Extension Workers;
C-14.Training on Livestock Management and Disease Control;
C-15.Coordination Skill Development at Divisional Level;
C-16.Agricultural and Marketing Database;
C-17.Training and Promotion of Mixed Farming;
D-18.Organization Management Skill Training;and,
D-19.Entrepreneurial Skill Training.

24. Using the criteria set forth together with the above mentioned strategies, priority among the nineteen project components were examined in order to develop an implementation plan of the Master Plan. *(Chapter 5.6).*

Priority Projects among the 19 components

Based on the selection criteria, the following 9 Priority Projects were selected through the analysis and should be implemented in the early phase of the Master Plan. These are:

1. Farming Practice Improvement;
4. Promotion of NERICA;
6. Compost Farming;
8. Improvement of Small Ruminant Production;
9. Women Animal Traction;
10. Small-scale Food Processing/Preservation;
15. Training on Livestock Management and Disease Control'
16. Coordination Skills Development at Divisional level; and,
17. Agriculture and Marketing Database;

25. The Master Plan has a two pronged approach for its implementation. One approach is the full implementation of the plan through the central or local government structures which is desired according to the implementation schedule. The other is for the implementation of the community initiative projects through the local development structures according to availability of finance and personnel in the division. The local development structures can take action independently, either ward by ward or village by village, by referring to the Master Plan. However, they need to bear in mind that independent implementation should be coordinated with the departments providing technical supervision.

Project Implementing Agency can be the following; Agriculture related departments, the local government – Area Council, Ward Development Committee(s), Village Development Committee(s), and NGOs/CBOs. When the whole plan is to be implemented by the government, the PIU should be duly set up, led by Agricultural departments.

Project Management Unit comprising of the members from Department of Agricultural Services, Livestock Services and Planning of DOSA, Community Development Office, Commissioner's Office, and Area Council. The unit provides an advisory function to the implementation bodies during the various stages covering planning, implementation and management of the projects *(Chapter 5.7).*

26. Budget sources are currently estimated as follows *(Chapter 5.8):*

(1) Existing Funds

In URD, rural development activities have been supported by a number of international organizations including:.

1) Social Development Fund (SDF – ADB support); and,
2) European Development Fund (EDF – EU support).

(2) The Divisional Development Fund (DDF)

The establishment of Divisional Development Funds within the local government structures is under consideration, with assistance from the 9th European Development Fund Program. However, as of November 2005, no specific and concrete plan has been drawn up.

(3) Securing Donor funding through Central Government Leadership

As described above, there are still no firm prospects for the establishment of the DDF, and the decentralization process is an ongoing process, and hence securing funding for the implementation of the projects will depend on the coordination and resource mobilization capacity of the technical agencies, DOSA and its divisional offices.

27. Another salient feature of the Master Plan is to promotes expansion of areas which benefit from the implementation of the projects. The Master Plan includes necessary activities for expansion to other areas in Programme C, Coordination Skill Development Programme. In addition, each of the 19 Project Descriptions mentions necessary activities for expansion. *(Chapter 5.10)*.

28. For the purpose of convenient use of the Master Plan by those who are engaged in development in URD, the Manual has been developed (Chapter 5. 11):

(1) How to use the Manual

a. Role as a Technical Guide

The action plan for the M/P includes guides on technical points to be considered, as a basis for reviewing existing projects, and for implementing new projects. Target zones are also indicated, based on a status analysis.

b. Role as a Guide for Selection of Target Area and Project

All 14 wards have their Ward Development Plans consisting of needs from villages constituted, but they are not entirely based on analysis of potentials and constraints of each ward. This Manual offers various data relating to past development activities in each ward with which each ward is able to know its potentials and constraints.

(2) Project Description

The purpose of the project, the target groups, the main activities, inputs, executing agency, priority areas (or potential areas), anticipated effects and other aspects are summarized here.

(3) Potential Mapping

Mapping of potential areas, needs by ward level, areas where major existing projects are implemented/located, the status of key rural infrastructure developed, and other aspects.

Major development-related matters are listed and mapped, so that they can be used in reviewing target areas and facilitating sites selection at the preparatory stage of project implementation.

(4) Data, graph and documents regarding potential and constraints of each ward

VI. Verification Project

VI -1. Draft Master Plan to Final Master Plan

29. As explained in I. Background and Objectives of the Study, the Study :1) identified several projects from the Provisional Master Plan formulated through the basic study and analysis; 2) implemented them as a pilot, and 3) incorporated feed back of the results of the projects to the Provisional Master Plan in order to formulate a sustainable Final Master Plan. Therefore, the verification study aims not only to carry out technology transfer to those involved but also to 'find necessary information and lessons for the four programmes in the Final Master Plan'. *(Chapter 6.1.1).*

30. Provisional Master Plan was formulated through studies and analysis explained below *(Chapter 6.1.2)*

    1) Targeted villages were decided by Rural Study (making ID of 60 villages), RRA (implemented in the selected 16 villages) and discussion with counterparts.
    2) Seventeen items of the Provisional Master Plan were determined after categorizing into four programmes based on the analysis of five capitals in rural area, villages' needs, potentials and constraints problem tree derived from PCM (see figure 9).
    3) Seventeen items of Project menu are categorized into four programmes: Livelihood Improvement, Improvement of Living Condition, Technical Support Service Strengthening and Capacity Building for Communities.

31. Six villages were selected for the Verification Study. One village from each DEC (District Extension Centre) area and another (Mansajang) were chosen as a reference village. Selection of villages depended on the existence of VDC (Village Development Committee) and whether or not the VDC was trained, whether CAP (Community Action Plan) is formulated, existence of active farmers' groups and whether extension workers reside near the villages *(Chapter 6.1.3).*

32. Six components as Verification Projects out of the Provisional Master Plan (17 components)

were selected through discussions with counterparts in consideration that: 1) some outcome should be achieved in the 2-year period allocated for the Verification Project; and, 2) technical objectives have partial uncertainty even though the project seemed appropriate *(Chapter 6.1.4)*.

33. The four verification projects were finally identified by accommodating the six individual components of the Provisional Master Plan: (1) Groundnut Production Improvement aimed at Livelihood Improvement.; on the other hand, (2) Vegetable Production and Food Processing aimed at Improvement of Living Condition; (3) NERICA Trial and Extension Planning focused on more experimental components in order to avoid duplication with the national project that aims to increase NERICA; and,, (4) Coordination Skill Development targeted governmental officers. The first three verification projects dealing with farmers encouraged farmers' independent activities by incorporating 'Sensitisation of Project Sustainability'. Out of the six components, 'Farming Practice Improvement Project' and 'Training and Promotion of Mixed Farming' can be done with any products. However, groundnuts and vegetables were selected as the targeted crops because women in the area undertake the cultivation of both groundnuts and vegetables *(Chapter 6.1.5)*.

34. Groundnut projects targeted two villages located in the north bank of the river. Vegetable projects targeted four villages in south bank of the river. NERICA projects targeted two villages in the south bank in the first year and four villages in the north bank of the river. Mansajang Kunda was as one of the target villages for the vegetable project in order to compare with other villages. NERICA projects should be implemented at individual farmer's level rather than village level *(Chapter 6.1.5)*.

35. Before the implementation of the V/P, the JICA Study Team carried out the following activities *(Chapter 6.1.6):*

    1) Supplementary survey：
       The Study Team carried out the supplementary survey on improved technologies related to the project components at not only the targeted villages but also other villages reviewing useful technologies and associated problems.
    2) Confirmation workshop：
       The implementation plan was reviewed in a village workshop and finalized in a participatory manner.
    3) Baseline survey：
       A baseline survey was conducted to finalize the plan by analyzing its result and to

establish a bench-mark.

36. Through implementation, monitoring and evaluation of the four Verification Projects, together with discussions at the Coordinating Committee and the result of supplementary surveys, the Master Plan was finalized. The Final Master Plan accommodated three more project components while deleting one. The newly accommodated ones are “Study on Pre and Post Harvest of Rice Production”, “Improvement of Small Ruminant Production” and “Animal Traction for Women”. The one deleted is “Sensitization for Sustainable Development”, which has actually been incorporated into the Programme A and B *(Chapter 6.1.7)*.

VI-2 Evaluation of Verification Projects

37. **Groundnut Production Improvement Project** *(Chapter 6.2.1)*

In Gambia, women’s roles in agriculture is crucial and significant. In URD, more women are engaged in groundnut production than in other divisions of the country, it therefore constitutes an important crop for them. However preparations of women’s fields are left until men complete theirs, which is regarded as a critical constraint since farming operations have to be conducted in a timely manner under rainfed conditions. In order for women to manage farming better and timely, the training in animal traction and the implements was provided to their groups. The verification projects for groundnut were conducted in URD and verified that it improved women farmers’ household condition and contributed to a general expansion of their field size. The lessons especially on livelihood aspects and implementation structure provided important feedback to the Master Plan.

38. **Vegetable Production, Processing and Preservation Project** *(Chapter 6.2.2)*

Women are the main actors in small scale vegetable production in URD. However, they generally do not produce enough quantities or meet the quality vegetables to attract markets. It is also difficult to market products even when they produce enough quantities because of limited transportation. Considering the status of malnutrition of children in URD, the verification project aimed to start cultivating vegetables for household consumption and processing/preservation by constructing fences, wells and providing several types of technological trainings, to increase production and improve quality of the production. Moreover, it is intended not only to mitigate losses in post-harvest and marketing risks but also to improve nutrition among households and villages. The lessons, especially on living condition aspects, were feedback to the Master Plan.

39. **NERICA Trial and Extension Planning** *(Chapter 6.2.3)*

The verification project on NERICA aimed at investigating the development potentials and future perspectives in URD through collection of data and information concerning the growth performance of NERICA and farmers' impressions. The analysis of data and information on the adaptability of NERICA to local conditions in URD was followed in order to formulate the extension plan for upland farmers in URD. In the Verification Study, three types of trials were carried out. The first, On-farm Demonstration, was to identify acceptable upland NERICA varieties through URD farmers' own observation on growth, yield and post-harvest processing, and also palatability tests. The second, "Varietal Screening Trial", was to investigate differences in performances of suitable varieties relating to the inclination among different hydrological conditions, and between fertilizer application levels (including no application). The third was "Adaptability Test" in which the adaptability of NERICA rice to upland area with less moisture is verified since upland rice requires more water compared to other cereals such as millet, maize and sorghum.

40. **Coordination Skill Development Programme** *(Chapter 6.2.4)*

The Departments of Agriculture Services (DAS) and of Livestock Services (DLS) have been playing important roles in the agricultural sectors through delivery of extension services. However, there is little coordination between donors and projects implemented in the division. This is to be improved upon with the offices of DAS and DLS expected to take the lead role and responsibility for coordination. Under the Divisional Coordinating Committee, chaired by the Commissioner, the technical agencies are supposed to work on maximizing the impact of projects implemented. This program aimed at enhancing capacity of the department staff for coordinating agriculture related projects, public relations and presentation.

VII. Conclusions and Recommendation

41. **Conclusions** *(Chapter 7.1)*

The Study has been verifying the effectiveness and possibility of the Master Plan which aims at Livelihood Improvement and Improvement of Living Conditions, for the last two years. Based on the results of the Verification Projects and the relevant policies in the country, the four concrete programmes including A. Livelihood Improvement, B. Improvement of Living Condition, C. Technical Support Service Strengthening and D. Capacity Building for Community, were proposed in the Master Plan. Each of the programmes accommodates several project components, amounting to 19 components in total. As explained below, the effectiveness of each of the programmes was

confirmed through the verification of several components constituting the programme. Regarding programmes for which the effectiveness could not be confirmed directly from the verification, the contents of the particular programmes were supplemented through feedback of the lessons learnt from the verification projects relevant to the programmes.

A. Livelihood Improvement Programme

As mentioned in the PRSP (2002), strengthening of means of livelihood is key to the mitigation of poverty in rural areas. This programme proposed several project components which the farmers in URD, who are dependent almost completely on agriculture, can easily work with and also projects which contribute to crop diversification. During the verification period, Groundnut Production Improvement Project, Vegetable Production/Processing and NERICA Trial and Planning, part of the components in this programme, were undertaken. Through the projects, it was confirmed that there are still many gaps for improvement of agricultural techniques and that farmers can also improve their income status by participating in trainings on agricultural techniques. In addition, with potential of NERICA, the potential of upland rice is also confirmed. The techniques of animal traction can be used for almost all the upland crops cultivated in URD, and therefore it also has possibility of promoting crop diversification. Considering the current situation, this programme consists of the components addressing technical advancement and crop diversification especially to upland rice and vegetables, together with the technical training components such as revitalization of the Giroba Center, which is expected to culminate in farmers' livelihood improvement, one of the objectives of the Master Plan.

B. Improvement of Living Condition Programme

Women play an important role in agriculture in the country. This programme proposed project components aiming at improvement of household food security status and women's workload mitigation both of which are also mentioned in the key strategies of the ANR sector policy. During the verification period, Vegetable Production / Processing, a part of the components in this programme, was conducted and improvement of nutritional status and increase in income were observed among the women members targeted. This programme was modified and finally it comprises of the components especially targeting improvement of women's living conditions.

C. Technical Support Service Strengthening Programme

Under the recent decentralization process, it is the Divisional Agricultural Office and Livestock Offices that assume the lead roles in coordination of technical support in the

agricultural sector. In this regard, this programme was proposed to improve quality of government led technical support services in the division. In the verification stage, Coordination Skill Development, the core components of the programme, was carried out. With the implementation of the project, it is confirmed that they not only provide services to specific projects but also undertake additional activities such as reporting and presentation to Divisional Coordination Committee, collection of agriculture related data and so forth. These are regarded as activities which can enhance the possibility of expanding the project's impact to other areas and also coordination between development organizations concerned in the division. This programme includes several components to enhance the offices' handling capacity of agricultural related information, which is expected to make the coordination between the concerned organizations meaningful.

D. Capacity Building Programme for Communities

As stressed in the PRSP/SPAII, community participation is inevitable in the process of poverty mitigation. Based on this idea, this programme was proposed to provide training to the farmers so as to become aware of the conditions needed for the sustainability of their projects. During the verification stage, none of the components in this programme was conducted in itself, but one of them, trainings for project sustainability and bookkeeping, was incorporated into the Groundnut and Vegetable projects. Due to the trainings, the farmers involved in both the projects have become able to show their preparedness for planning of next season's activities. It significantly helps the farmers to benefit from impact of projects. In this regard, this programme is considered to be indispensable.

Efficiency of the four programmes as a whole

Programmes of A. Livelihood Improvement and B. Improvement of Living Condition alone could produce positive impacts on the communities. However, without the capacity of the offices' staff in service delivery, impacts of projects cannot be extended to other communities, and without the capacity of the community in assuring project sustainability, impacts of project cannot be sustainable in a community. In the verification, with the fact that the target farmers' capacity was improved under Programme D. Capacity Building of Community, fruits from Programme A and B were enjoyed by the targeted communities. Also with the fact that the capacity of the offices' and their extension centers' staff was strengthened with Programme C. Technical Support Service Strengthening, a fundamental feedback system to concerned organizations were set up, which were formerly lacking or not functioning well. At the same time, a mean of expansion from one area to another was undertaken as part of activities such as Newsletter publication and Radio broadcast.

In Chapter 5, it was explained by illustrating Programme C., which is similar to the engine of a truck, unless the engine is fully functional, the truck cannot reach the goal of the Master Plan, livelihood improvement and improvement of living condition for the farmers in URD, since without Programme C, impacts of each project component remains within the areas initially targeted, and not extended to the outside. In the course of implementing the verification projects, the capacity of the engine was enhanced to the level that smooth implementation of projects in the division was secured to some extent. In other words, the system of delivering technical support services by the officers to farmers and any projects in the division was formed and somehow became functional.

As far as the function of the above mentioned system is maintained, more expanded impacts from any single project component can be expected, through the coordination between the offices and other development partners. In this regard, it becomes more realistic that the four programmes proposed in the Master Plan can contribute to achieving the goal of livelihood improvement and improvement of living conditions for the farmers in the division.

42. **Lessons Learnt and Recommendation** *(Chapter 7.2)*

The experiences, especially regarding the project implementation and monitoring & evaluation by the offices during the last two years of the verification stages, can be useful for future project management. Therefore the implementation, continuation and expansion/replication of the proposed projects in the Master Plan should be carried out based on the lessons learnt and derived from the verification projects. After the Study, it is expected that The Gambian side utilize the Plan and implement the project components. However, there are several points to note in the implementation. Among the points, the five items concerning the Plan as a whole are dilated below; 1) Provision of development opportunities, 2) Cooperation between development organizations at divisional level, 3) Promotion of frequent contacts between communities, 4) Management of efficient project implementation and 5) Role of the Central Government towards immediate implementation

1. Provision of development opportunities

Implementation of verification projects has the characteristics of providing development opportunities to the people who have eagerness for development. Some people could make a good use of development opportunity, while others could not do so much, and such results are related to the extension workers availability and their ability. Thus, it is important for the extension workers to extend their operational area and to improve their capacity in order to

provide more development opportunities for farmers. Regular meeting, coordination skill and OJT training, frequent contact between extension workers and farmers, which were conducted during the verification projects played an important role in strengthening extension workers' capacity, as they got more confidence. Nonetheless, the extension workers should have continuous capacity building in order to achieve sustainable provision of development opportunities for both farmers and administration. In addition, it is necessary that the extension workers have at least a means of transportation for visiting farmers and the operational facilities of the divisional officers for smooth implementation (such as electricity, or communication facilities).

2. Cooperation between development organizations at divisional level

Agriculture includes not only cultivation activities but also multi dimensional factors, such as marketing or extension. Therefore, various projects are included in the Master Plan and support from various organizations is essential for conducting smooth implementation of the projects. Various organizations, DAS, DES, DLS, DLO, Divisional government, Commissioner, CBOs and NGOs were involved in implementing the verification projects, and horizontal cooperation among organizations in agriculture sector was observed in URD. The Project Management Unit (PMU), which is composed of key personnel from each organization, can be regarded as one of the symbolic achievements of horizontal cooperation at divisional level. Such horizontal cooperation is essential for promoting decentralization in the division where information and human resources are limited and should be continued.

3. Promotion of frequent contacts between communities

Naturally, contact between communities is not very active in the region. However, with active intervention through extension workers, it was observed that farmers got stimulated and projects smoothly implemented. Useful techniques are accumulated in human resources in the region and it could be extended through mutual information exchange. It is expected that the information including useful techniques will be exchanged further among villages by referring to this Study. As can be seen, the roles of Village Extension Workers (VEWs) and Livestock Assistances (LAs) are important in promoting smooth exchange.

4. Management for efficient implementation

There are many facilities in URD such as cereal banks, LADEP facilities, fences, wells, which were built by NGOs and other organizations, but few of them have been used efficiently. It is therefore more economic to use existing facilities rather than to build new

ones. Management and operational ability of those facilities are essential for efficient usage, but farmers in URD are not so much capable of that. capacity development of farmers, DAS, and DLS, which was encouraged through the verification project, is encouraged to be continued.

5. Role of the Central Government towards immediate implementation

Through the Study, it is observed that the division even though located in the remote area can hold the possibility of sustainable agricultural development. It is also confirmed that the government support is indispensable especially at the beginning of the project implementation. The 9 components were identified as the priority projects which are to be implemented in the earlier stage of the Master Plan period of 10 years. DOSA and its divisional arms have to take immediate actions for the promotion of the priority projects' implementation at the divisional level and also for reflection of the contents of the Plan to the forthcoming URD divisional development plan.

In the course of formulating the Master Plan, special attention was given to ease of project implementation. Therefore, any development organizations in the division can make use of the Plan and implement its proposed projects in a manner appropriate to them. Both the divisional offices of DAS and DLS have enough extension centers which are dispersed in the division. Through the verification projects, it is observed and confirmed that project implementation and expansion can be promoted by not only involving the offices at Basse, but also these centers. In line with the recent movement towards decentralization, this Study also stresses the importance of project implementation at divisional level. In this regard, the "Project Implementation Manual" was developed for the stakeholders in URD, especially the extension workers at the frontline of community development. This manual is also to be delivered to and fully utilized by Area Council, Ward Development Committee, MDFT as well as NGO/CBO operating within the division.

Continuation of the verification projects is critical for attracting people in URD to implement some projects proposed in the Master Plan. Therefore, besides the above mentioned, the following highlights recommendations for continuation of each of the verification projects.

6. Groundnut production Improvement Project

The groundnut production improvement project contributed to mitigate labour burden and drudgery on women, and it was especially efficient in remote rural villages. In such remote rural villages, extension services are rarely accessible and there is few animal traction

implements, and therefore women operate almost all the cultivation operations themselves without using animals, and consequently their farm size are small. It is found that providing women with appropriate animal traction equipments and training contributed to expansion of the farm size. As it is an important issue for the Gambia to reduce workload of women and to secure income sources, this project should be encouraged by the government. In this regard, equipments and donkeys provided by the project should be of appropriate quality and health status and it is important to have beneficiaries participate as much as possible in identifying and purchasing of such inputs, from the view point of project sustainability. In addition, the Department of Agricultural Services (DAS) should coordinate flexibly by providing personnel of extension agencies so that they can provide technical advice to the farmers especially at the initial stage of the project.

7. Vegetable Production, Processing and Preservation Project

During the implementation of the vegetable verification project, farmers were able to consume vegetables in greater quality and variety, which contributed to improving their nutrition status, provided that the cultivation was carried out smoothly. In addition, agricultural support for women contributed in increasing their production and income. Though nutrition improvement was emphasized in vegetable verification projects in the Study, it is encouraged to shift its focus to income improvement by marketing their fresh products and processed ones. Overall, in order to achieve sustainable development, it is inevitable to provide holistic support in cultivation, small-scale processing and preservation, and marketing together with bookkeeping and literacy education.

Regarding each verification village, for those that experience damage by insects, it is essential to plant early, to stagger their cultivation period, considering market glut, and to cultivate more local products rather than exotic ones. For the village that consume most of its production within the village, it is recommended to produce different varieties not only for self-consumption but also for selling at local market. For the villages that sell their production, it is encouraged to form vegetable production groups, purchase equipment jointly, market the products in cooperative, process and preserve the products, mutually exchange information, and ultimately organize vegetable selling cooperatives.

8. NERICA Trial and Extension Planning

The NERICA verification project has proven that NERICA have potential to be broadly disseminated not only in URD but also to the whole country. However, it is regarded that the extension of NERICA to the whole country would take more time. In addition, there is not enough technical support , and such has been regarded as an essential element,for

smooth dissemination. Moreover, the purity of NERICA seeds currently under extension is not satisfactory enough. For the sustainable extension of this potential variety, prompt countermeasures should be carried out by NARI and DAS.

9. Coordination Skill Development Programme

Through drawing up of the Master Plan and implementation of the verification projects, counterparts improved their technical ability and motivation for work. For example, they prepared reports for DCC and newsletters, conducted regular meetings, exchanged information with farmers more frequently. With regard to the newsletters publication, the central government is trying to extend the work to nationwide with broad potential development. By continuing the project, the involved personnel including counterpart can have a higher motivation, and it can be assured to contribute to further development and smooth implementation of several projects.

THE STUDY ON AGRICULTURE AND RURAL DEVELOPMENT IN THE UPPER RIVER DIVISION, THE REPUBLIC OF THE GAMBIA

Final Report

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Chapter 1 Background and Objectives of the Study

1.1 Background of the Study

The Republic of The Gambia is surrounded by Senegal on all three sides (east, south and north) except on the Atlantic coastline. With an area of 11,295km^2, it is one of the smallest countries in Africa. With a population of about 1.4 million and a growth rate of 2.8 percent (Provisional 2003 Census Results), The Gambia has one of the highest population densities in Africa.

The Gambia formulated a long-term development framework (Vision 2020), in which strategies such as increasing agricultural production and productivity, well-balanced development between rain-fed and irrigated agriculture, creation of job opportunities, crop diversification and correction of differential income were espoused for the agricultural sector, in order to promote a sound agriculture and rural development.

The agricultural sector, which is placed as an important sector in the national economy, accounts for around 25% of GDP and employs over 70% of the population. However, the lack of adequate agricultural technologies and a poor extension delivery system has hindered economic development. The Study area, Upper River Division (URD), one of the five divisions in the country, is relatively disadvantaged with 73% of its population living below the poverty line, whereas the national average is 52%.

In order to address the situation mentioned above, the Government of The Gambia (GOTG) requested the Government of Japan (GOJ) in October 2000 to undertake the study related to the agricultural development plan (Master Plan) for the improvement of rural livelihood. In response to the request, GOJ sent a preliminary study team in August 2002 in order to discuss with GOTG. The governments of both countries finally reached an agreement on the Scope of Work (S/W) of the study.

1.2 Objectives of the Study

The objectives of the Study are as stated below:

(1) to formulate a Master Plan for agriculture and rural development in URD contributing to the improvement of rural livelihood and household income based on agricultural activities;
(2) to carry out technology transfer to the Gambian counterpart personnel through capacity building; and,
(3) to carry out technology transfer to local people in the targeted area through the

implementation of verification projects.

The overall goal of the Master Plan is to achieve an affluent rural area through the improvement of rural livelihoods and household incomes. Capacity building to enable counterpart personnel to promote and disseminate improved extension technologies to farmers and to enable the local people to manage the projects by themselves will be implemented in the Master Plan.

1.3 Study Area

The Study Area, which is the Upper River Division (URD), is located in the far eastern part of the Gambia and is situated at a distance of about 350 km from the Capital Banjul. The Gambia river which runs in the State divides the Study Area to north and southern parts and runs inside the country before joining the Atlantic Ocean.

1.4 Basic Approach for Master Plan Formulation

Many projects coined as Integrated Rural Development interventions have been undertaken in the 1980s, but these projects have hardly brought about the expected impacts in improvement of farmers' living conditions. With the review of past experiences of the Projects which largely have been carried out through a Top-down approach; more attention is now paid to the Bottom-up approach in the country. Another reason for the poor result of the projects is that the beneficiaries who are the farmers themselves did not take full responsibility of the projects. In other words, farmers did not even think that the project they are involved, is actually theirs. As many have rightly observed, with withdrawal of donors' support, most of them ceased to work. Therefore, many endeavours are being made to bring about the involvement of farmers in project interventions from planning to implementation. These include endeavours such as establishing and working through Village Development Committees (VDCs) at village level. This idea has been extensively incorporated in the course of formulation of the Master Plan in this Study.

However, grasping needs of farmers is sometimes not enough for both addressing problems which extend over several villages and also to attain the long-term objectives of the agricultural sector. It is because farmers tend to show interests only in the activities in which they are directly involved and are of specific concern to their area. To avoid this, the Study tries to incorporate a top-down approach with a bottom-up approach. The catalysts for the incorporation of policy based objectives into demand-driven/participatory development are divisional offices, which in this case are the Divisional Agricultural Office (DAO). Therefore, more focus on enhancing the capability of the staff in the office shall be made in the Master Plan.

The feature of this study is an integrated frame consisting of the formulation of the Master Plan and the implementation of verification projects. At the first phase of the Study, the main emphasis has been on three main areas: clarification of development subjects, evaluation of potentials, and review of existing projects. In order to understand the social structures in URD, the study team conducted rural surveys which focused on analyzing the livelihoods of the population.

After selecting the verification project sites, the study team conducted detailed rural surveys in these sites with the VDCs and farmer's groups selecting project items and formulating draft project plans in the workshops. The study team and the extension officers provided technical advice regarding the draft project plans. The projects were verified based on three criteria; capacity of stakeholders, easy availability of fund and coordination with other programmes. Monitoring and evaluation employing these criteria shall be conducted and its results shall be fed back into the project plans in order to also make them self-operated and sustainable. Simultaneously, lessons from the implementation of verification projects shall be fed back to the Master Plan for replication in other sites in URD.

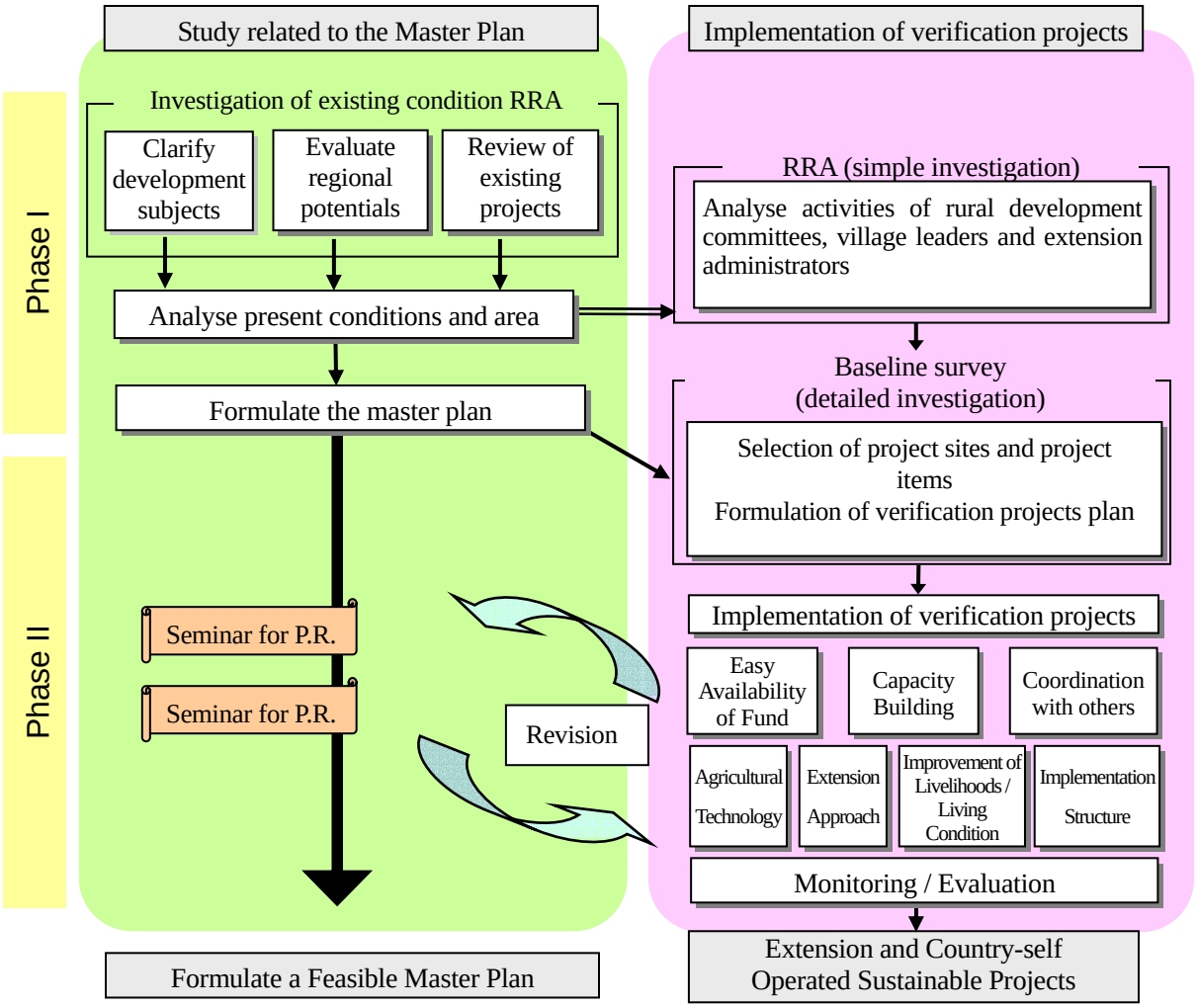

Figure 1.1 Flowchart of the Study

Chapter 2 Agriculture and Decentralisation in The Gambia

2.1 Agricultural Sector

The agricultural sector is the key to socio-economic development in The Gambia in view of the high proportion of the population, estimated to be over 70 %, who are dependent on it as their main stay and livelihoods. Its contribution to the national economy is also pivotal constituting over 25 % of the GDP and 90 % of foreign exchange earnings.

The sector is characterized predominantly by the subsistence production of food crops comprising cereals such as early millet, late millet, maize, sorghum and rice; semi-intensive production of cash crops comprising of groundnut, cotton and horticultural production and traditional livestock raising. Production and productivity are generally low due to a number of factors culminating from dependency on rainfall for production, low investment in input and production related infrastructure and small and fragmented holdings. However, recently a modernized sector has been emerging particularly for commercial poultry and horticulture in the urban and peri-urban areas.

Farmers generally practice mixed farming, although crops account for a significant portion of the production. Each year some 180,000 ha is cultivated, of which only about 3,000 ha is irrigated. Of the crops, groundnuts are the most important and occupy 40-50 % of the cultivated area, followed by early millet 25%, rice 8 %, sorghum 7 %, maize 7 % and the remaining is occupied by sesame and other crops. About 300,000 heads of cattle; 260,000 heads of small ruminants (sheep and goat) and about 700,000 heads of poultry exist mostly under traditional system.

2.2 Agricultural Policy

The Draft Agriculture and Natural Resources (ANR) Sector Policy 2001 - 2020 was formulated. The key thrust of this policy focuses on the following strategic objectives:

- achieve national food security and curtail the importation of basic foods;
- increase overall sector output particularly of domestic food and export products through production and productivity enhancement;
- create employment and generate income for the majority of the rural population;
- diversify the production base to facilitate the production of a wide range of food and export crops in order to reduce the fluctuations and uncertainties in household income and export earnings;

- reduce disparities between rural-urban as well as between men and women, curb the rural-urban drift and accelerate the pace of development of the rural sector;
- provide effective linkages with other sectors of the economy so as to enhance mutual benefits complementarily and supplementarily on a sustainable basis;
- ensure the judicious and sustainable exploitation of the country's natural resource base so as to conserve and improve biodiversity and to enhance the productivity in consistent with consideration of the needs and rights of future generations;
- promote private sector-led growth and enhance capacity of producer organizations.

Within the ANR Sector Policy, the major strategies related to field crops, horticulture, livestock and household food security are mentioned below:

【Field Crop production】

- Introduction and development of crop varieties suitable for the various agro-ecological zones in the country;
- Reduction of the heavy work load and drudgery particularly for women, to raise labour productivity;
- Alleviation of the labour bottlenecks especially at weeding; and,
- Establishment of an effective system for the production, storage and distribution of improved seed.

【Horticulture crops】

- Job creation and income generation by encouraging rural production of vegetables in the dry season; and,
- Increased consumption of vegetables and fruits to improve nutrition in the rural areas.

【Livestock】

- Increase rural incomes and use of livestock for animal traction;
- Decrease disease incidence for small ruminants; and,
- Improve soil fertility and ensure an effective linkage between crop and livestock including ensuring sustainable feed availability during the dry season.

【Household food security】

- Enhancing food processing and preservation skills, including development of recipes.

In line with The Gambia Incorporated Vision 2020, formulated in 1996 which provides a long

term framework for development and in which the country is envisioned to be transformed into middle - income country "... an export-oriented agricultural and manufacturing nation, thriving on free market policies and a vibrant private sector, sustained by a well-educated, trained, skilled, healthy …" the synergies with sector policies such as those of trade, health, education, tourism etc. for both forward and backward linkages are therefore critical in ensuring a multi-sectoral approach for sustainable development.

Furthermore, given the high proportion particularly of the rural population dependent on agriculture and who constitute the great majority of the poor, the policy is very much linked to the Second Strategy for Poverty Alleviation (SPAII) also known as the Poverty Reduction Strategy Paper (PRSP) which is the blue print for socioeconomic development.

The main objective of The Gambian PRSP is to promote growth and employment, enhance the provision of social services and mainstream cross-cutting policies for gender issues, HIV/AIDS problems and improve the environment as a means of accelerating poverty reduction. In this regard, the PRSP has 5 main pillars:

- creating an enabling environment to promote economic growth and poverty reduction;
- enhancing the productive capacities and social protection of the poor and vulnerable population;
- improving coverage of basic social service needs of the poor and vulnerable population;
- capacity building of local communities and civil society organizations to play an active role in the development process; and
- Consideration of mainstreaming gender equity, environmental issues, nutrition and HIV/AIDS into all development programs.

Thus the agricultural sector policy objectives will contribute to the attainment of 3 pillars of the PRSP.

2.3 Agricultural Production in The Gambia

The agricultural production in The Gambia is mainly composed of groundnut, vegetable and cereal production. The quantities of production and trends of the main crops are shown in the following figure.

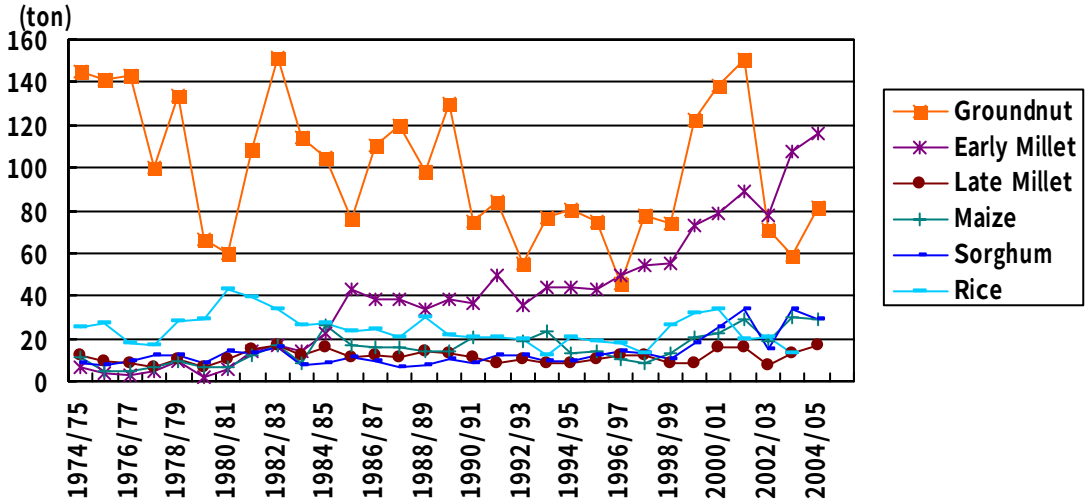

Figure 2.1 Changes of Major Crops Production

Table 2.1 Production of Major Crops (in 000 MT) 1992-2004

Product / Year	Ground nut	Early Millet	Late Millet	Maize	Sorghum	Rice	Total Cereals
1974/75	145.20	6.80	11.70	10.90	8.00	25.10	65.00
1975/76	141.10	3.60	9.30	4.80	7.40	27.10	53.50
1976/77	143.00	3.00	8.10	4.50	9.60	18.00	44.10
1977/78	100.00	4.40	6.40	7.00	11.90	17.20	47.50
1978/79	133.4	9.50	10.30	9.50	12.20	28.30	70.60
1979/80	66.90	1.70	7.00	6.60	8.80	29.40	53.70
1980/81	60.20	5.40	9.90	6.30	13.70	42.70	79.30
1981/82	108.9	14.50	14.70	12.50	12.80	39.50	96.20
1982/83	151.40	16.90	16.80	17.00	15.70	33.70	101.30
1983/84	113.8	14.40	11.70	8.50	7.10	26.10	68.20
1984/85	105.1	22.90	15.60	26.50	8.20	27.20	86.50
1985/86	75.80	43.00	11.60	17.30	11.60	23.10	116.10
1986/87	110.35	38.75	12.40	15.44	9.00	24.46	102.11
1987/88	120.0	38.20	11.42	15.52	6.55	20.43	92.43
1988/89	98.36	33.63	14.34	14.14	7.16	29.49	100.17
1989/90	129.90	38.01	12.68	13.63	10.72	21.23	98.16
1990/91	74.53	36.08	10.81	20.42	8.23	21.00	89.67
1991/92	84.16	49.55	8.21		12.18	20.53	112.29
1992/93	54.87	36.02	10.24	18.27	12.26	19.41	96.20
1993/94	76.72	43.66	8.51	23.78	8.97	12.05	96.97
1994/95	80.80	44.09	8.75	13.31	8.90	20.27	95.32
1995/96	75.18	43.44	10.58	13.63	11.87	18.95	98.47
1996/97	45.82	49.50	11.99	10.02	13.72	18.19	103.42
1997/98	78.10	54.37	11.72	8.47	12.93	13.05	100.54
1998/99	73.46	55.60	8.07	13.01	9.87	26.64	113.19
1999/00	122.86	72.62	8.34	20.42	17.97	31.65	156.59
2000/01	138.03	78.47	16.11	21.99	24.88	34.08	175.53
2001/02	151.07	89.02	15.95	28.99	33.42	19.20	186.58
2002/03	71.53	77.34	7.28	18.58	15.21	20.33	138.74
2003/04	58.54	107.14	13.20	30.13	33.35	13.20	197.02
2004/05	81.50	115.98	16.52	29.21	29.00	NA	190.71

Source: National Agricultural Sample Survey/Department of Planning

(1) Groundnut

Groundnut production has been the main source of income for farmers and an important source of foreign exchange and employment at the national level. It is the crop of choice for most of the farmers and comprises of both oil and confectionery. Groundnuts are hardy, productive and an ideal leguminous crop within the cropping system. It is drought tolerant and requires good sunshine during pod formation period, and The Gambian climate is suitable for groundnut cultivation. It requires an intensive labour which is provided mainly by the family labour and draught animals. Production has been fluctuating and declined particularly until the middle of 1990s; and has recently been picking up.

Table 2.2 Main Characteristics of Groundnut Production in The Gambia

Production	From the middle of 1990s, the production amount has been increasing.	
Area	0.5 - 1 ha	
Seed	Seeds kept from the previous year's harvest Seed dressing is recommended for protection of seedlings	
Planting	Optimum time of Planting is end of July and dependent on the variety (not later than middle of July for oil cultivars The first week in August for the early maturing confectioneries)	
Fertilizer	NPK, Not later than two weeks after sowing	
Marketing	Grading or standardization of product is not conducted Financing, risk bearing and insurance plans and market intelligence are fragile	
Policy	1948	Establishment of Gambia Oilseed Marketing Board (GOMB)
	1990	Liberalization of groundnut marketing
	1992	Restructuring of GOMB to Gambia Oilseed Processing and Marketing Corporation (GOPMACD)
	1993	Privatization and eventual possession of GOPMACD by Alimenta SA, a Swiss Company
	1997	EU and Government study of the groundnut industry for revitalization
	1999	Establishment of ASPA to manage the groundnut sub-sector Re-possession of GGC Assets from Alimenta by the Government

(2) Cereal

Cereals cultivated in The Gambia can be broadly grouped into rice and coarse grains (maize, millet, sorghum, findi, early and late millet). Both the production and cultivated area of cereals has been increasing markedly. However, differences in the performance can be observed in early millet registering several fold increases whilst rice production performance has stagnated or even declined with time.

(2-1) Rice

Rice is the most important staple food crop in the country. Current policy and strategic intervention have been aimed at increasing food security through motivating local rice production.

Production is carried out in upland rainfed and lowland environments which include deep flooded swamps, mangrove and irrigated systems.

Table 2.3 Main Characteristics of Rice Production in The Gambia

Production	Back swamp	Upland	Tidal	Swamp	Irrigated
Seed	Any variety 120-140 days	NERICA 90-100 days	TNS14 100-140 days	indigenous	
	4D / kg (Mainly Raised in CRD or under Taiwan projects at Sapu)				
Seeding	Direct seeding May-June	-	-	-	1st week of January
Planting	Transplant July - August	-	Harvest before rain	-	-
Fertilizer	Urea, NPK and compost				
Marketing	Weekly market 12D / kg (average) (NASS/DOP)				
Policy	1966	Introduction of irrigated farming in farmers own perimeters in CRD			
	1983	Implementation of the Jahally Pactcharr Smallholder Rice Project			
	1989	Liberalization of rice marketing			

(2-2) Coarse Grains

Coarse grains comprise of traditional cereals and have experienced an increased production because of farmers' response to food security concerns. Most of the increased performance can be attributed to area expansion, since the yields have been constant. Grains have largely fitted into the farming systems.

Table 2.4 Main Characteristics of Coarse grain Production in The Gambia

Production	Maize	Early Millet	Late Millet	Sorghum	Findi
Seed	NCB, JEKA 90-120 days	Indigenous 90-100 days	Indigenous 120-140 days	Indigenous 90-120 days	Indigenous 80-90 days
	8D / kg				
Seeding	Direct seeding May-June	Dry seeding in May/June	-	-	Direct seeding
Planting	Transplant in July - August	-	Direct seeding in June - July	Direct seeding in June - July	Dry seeding in April - May
Fertilizer	Urea, NPK and Compost				
Marketing	Weekly market 8D / kg (average)				
Policy	—	Implementation of cereal package deal			
	1989	Liberalization of cereal marketing			
	1989	Introduction of dehulling and milling machines at village level			

(3) Vegetable

Vegetable production constitutes important sources of food, rural income and employment. It is cultivated predominantly in communal and individual plots and mostly cultivated by women. Although the cultivation presently is carried out year-round, the most active period is the dry

season from November to May. The principal vegetables cultivated include onions, cabbage, lettuce, green leaves, peppers, garden eggs (aubergine), okra

Table 2.5 Main Characteristics of Vegetable Production in The Gambia

Area	For export market: average area of over 20ha For 10% of the export market and others: 5 - 10ha For domestic market: less than 5ha	
Seed	Various sources including seeds from previous harvest and seed importers	
Planting	Dry and wet season planting	
Fertilizer	Organic manure, Inorganic fertilizers NPK	
Marketing	Local markets, Exports	
Policy	1973	Introduction of pilot village vegetable schemes in WD
	1976	Promotion of increased intake of vegetables by rural communities to improve nutritional status
	1991	Development of National Horticultural Development Programme with UNDP and FAO assistance

2.4 Livestock in The Gambia

The agriculture system in The Gambia is mainly of agro-pastoral system characterized by small scale mixed farming. The system involves grazing at communal grazing lands and the cultivation of private lands. Basically, grazing is conducted during the rainy season in communal grazing lands and livestock get free access to most of the places in the dry season, especially after the completion of harvesting. Thus, the annual grazing cycle is based on periodic movements of flocks, searching for grass and watering points based on the seasons and climatic changes.

The livestock sector plays an important role in the economic development at both farmer and national levels. The livestock sector contributed 24% of agricultural GDP in 1997. The share of income of livestock holders derived from animals and its productions range from 10 to 50% of annual income. In rural areas, 48% of households are breeding cattle with 13.7 heads per household. However, over 60% of cattle owners hold less than 5 heads of cattle whilst a few owns large herd flocks. Over 85 % of households possess sheep and goats, owning an average 13.8 heads.

The main livestock raised include cattle, sheep, goats, horse, donkey, poultry and swine. Swine production is however lower due to the high %age of people following the Islamic religion. The purposes of cattle raising are milk, meat and draught power for farming. Sheep and goats are mainly for meat production but a few goats are raised to produce milk. Horses and donkeys are mainly utilized for the purpose of transportation and draught power for farming.

Like many countries, livestock raising in The Gambia plays important roles such as:

- Food production: milk and meat for direct consumptions
- Buffer against risks and accidents: as bank , deposits, insurance and food security in cases of floods or droughts and known as “Bank of the hoof”
- Non-food functions: draught powers, transportation, improve soil fertility through manure, taking off bio-mass, dispersal of useful seeds by walking, materials for housing
- Cultural functions: as status, ceremonial occasions, dowry, betrothal money

Figure 2.2 and Table 2.6 show a time series of livestock population from 1984 to 2002. (Note: Statistical data on livestock in The Gambia suffers from inconsistencies. Consequently we have modified some data).

Table 2.6 Livestock Population in The Gambia

Animal / Year	Cattle	Sheep	Goat	Horse	Donkey
1984	195,409	135,093	187,406	10,671	35,652
1985	290,284	175,221	194,280	13,098	37,404
1986	295,145	180,501	197,325	14,400	36,805
1987	305,081	180,647	204,140	16,848	40,270
1988	386,762	185,372	225,231	16,361	41,822
1989	317,000	190,420	207,007	16,740	40,973
1990	308,264	120,913	156,260	15,559	36,573
1991	280,325	120,841	179,635	16,181	31,220
1992	172,689	98,416	132,933	15,684	31,494
1993	305,000	106,959	144,769	16,762	35,635
1994	278,538	156,015	214,056	17,556	33,448
1995	289,681	159,016	223,767	17,284	33,602
1996	322,259	166,172	231,398	12,838	24,968
1997	229,734	125,627	204,792	16,442	32,734
1998	226,161	91,507	185,191	16,696	37,981
1999	307,583	98,243	161,658	21,915	32,981
2000	308,410	101,924	143,927	21,781	38,224
2001	323,167	192,232	198,584	17,147	43,340
2002	326,556	145,593	261,963	27,429	40,136

Source：NASS, DOP

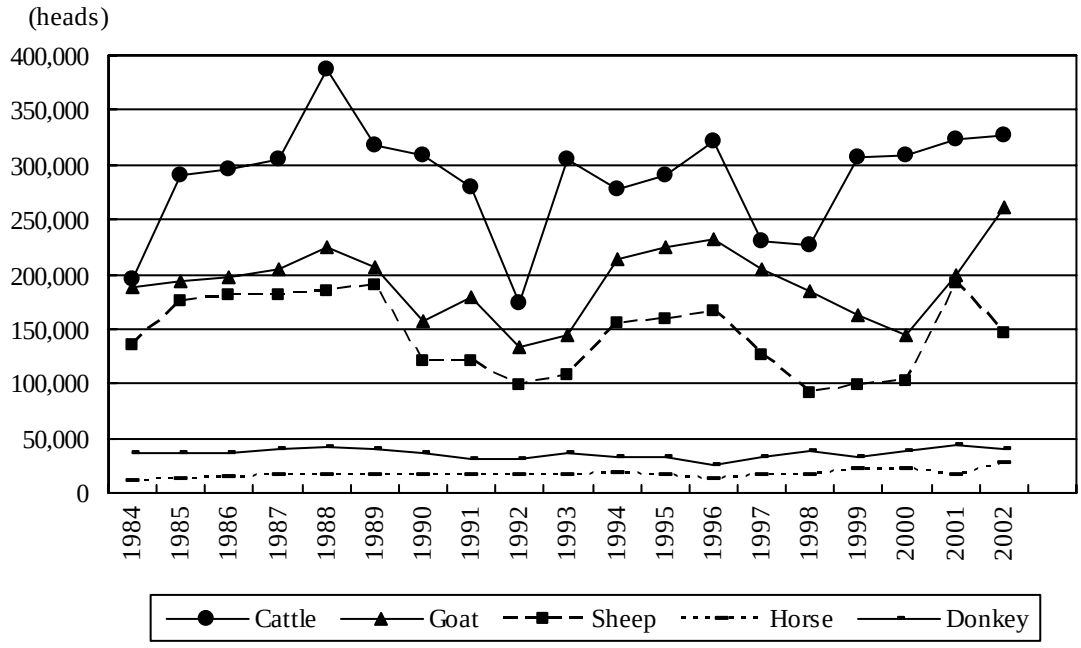

Figure 2.2 Changes of Animal Production

Figure 2.3 and Table 2.7 indicate the composition of cattle in The Gambia. Regarding the data on cattle composition, the rate of cows and heifers should be increased more.

Table 2.7 Composition of Cattle

Milking	36%
Heifer	9%
Calves	17%
Young	17%
Young exe	6%
Oxen	12%
Mating bull	3%

Source: Review&Diagnostic study report:65

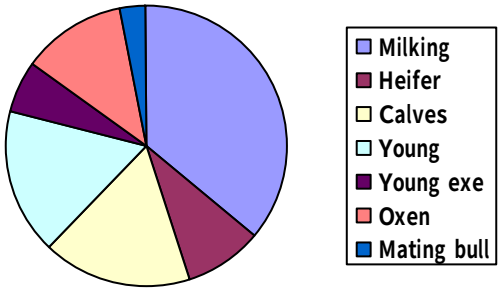

Figure 2.3 Composition of Cattle

2.5 Key Public Agencies for Agricultural Extension

The key public agencies responsible for agricultural extension are under the Departments of State of Agriculture and Natural Resources. The Department of State of Agriculture (DOSA) is responsible for the crop and livestock sub sector. These public services are conducted by the line departments of Agricultural Services (DAS) and Livestock Services (DLS) under the DOSA. The organization of DOSA is divided into the following structures (refer to Appendix 2.1).

1) Management Structures

The DOSA has two management structures, the Central Coordinating Committee and the Central

Management Committee. The Central Coordinating Committee, chaired by the Secretary of State, is an inter-sectional coordinating organ comprising of all heads of technical staff and line departments, all heads of projects and programmes and all the heads of autonomous organs of FAO, NARI, Chamen Training Center and Freedom From Hunger Campaign (FFHC). The Central Management Committee assists in the policy advice of the Office of the Permanent Secretary. It is chaired by the Permanent Secretary and includes the Deputy Permanent Secretaries of Finance and Administration, Programme/Project Office and the National CILSS Office and the Director of the Department of Planning.

2) Autonomous Technical Organs

The autonomous technical organs include the office of the FAO Country Representative, the National Agricultural Research Institute (NARI), The Gambia Cotton Company (GAMCOT), the Chamen Self Development and Training Center and Freedom From Hunger Campaign (FFHC). All these institutions sit on the Central Coordinating Committee of DOSA.

3) Technical Staff Departments/Offices

The DOSA has four technical staff departments. These are Department of Finance & Administration, the Programme and Project Office and the National CILSS Office each headed by a Deputy Permanent Secretary and the Department of Planning (DOP) headed by a Director. These provide specialized supports to the technical line departments and the autonomous technical organs.

The DOP is the staff unit for Agriculture and Natural Resources sector and is responsible for policy advice, preparation of agriculture and rural resources investment programmes and projects as well as gathering and provision of data on the performance of the sector.

4) Technical Line Departments

DOSA has three technical line departments. These are the Department of Agricultural Service (DAS), Livestock Services (DLS) and Cooperative Development (DOCD). These Departments have a functional administrative structure that stretches from national level to the divisional and grass roots levels.

2.6 Decentralisation Policy

2.6.1 General

The 1997 Constitution provides the institutional initiatives planned under the Decentralization and Local Government Reform Programme. The purposes of these initiatives are to involve the local communities in the national socio-economic development process and to empower them to make

their own decisions. For performing this process, the devolution of powers to local communities is essential.

Under the Reform of the Local Government System and Decentralization policy, the Local Government Act, 2002 was enacted by the President. Accordingly, Local Government Administrative Council elections were held throughout the country in April 2002.

The Local Government Act, 2002 aims at the transfer of Agricultural Services to Councils i.e. the establishment of Department of Agriculture and Livestock Services in each Council and the transfer of Government personnel including those in agriculture and natural resources to Councils. The transfer shall be done gradually considering the capacity of Councils.

2.6.2 Support to Decentralization to Rural Development (SDRD)

The Government efforts to implement the decentralization process have received support from many donors especially the European Commission (EC) through the European Development Fund (EDF). The Support to Decentralization of Rural Development (SDRD) was implemented during the 8th EDF and was a follow up to the Divisional Development programme (DDP) implemented under the 7th EDF. Ward Councilors nominated to the Area Councils used to implement Ward and Village projects during DDP.

Among the lessons learned in the course of implementing DDP was delays in disbursement of funds allocated to the project as the fund were controlled at the central level resulting in slow implementation at divisional level.

Under SDRD implemented in North Bank Division (NBD), Western Division (WD) and Upper River Division (URD), more responsibilities were transferred to the local Councils. Funds allocated are paid in bank accounts maintained by each of the divisions and the project was implemented with the funds.

2.6.3 Technical Line Departments of DOSA under Decentralisation Policy

Three technical line departments and a staff technical department of DOSA are each headed by a technical director and have clearly defined subsectoral responsibilities within the overall sectoral responsibility of DOSA.

1) Comparison of organization charts of DOSA Before and After Decentralization

Appendix 2.1 presents the Administrative Organizational Chart of DOSA before decentralization whilst Appendix 2.2 presents the Administrative Organizational Chart of DOSA after

decentralization and its inter-phase with the Divisional Administration. Looking at these two figures in juxtaposition, the following points of comparison are evident:

2) Before Decentralization

- The spatial administrative structures of all the technical line departments (Department of Agricultural Services, Livestock Services and Cooperative Development) and the technical staff Department of Planning stretch from the national level to the village level under the administrative and professional control of the respective national directors of these departments;
- All the staff at each of these levels (national, divisional, district and village) are employees of DOSA recruited by the Personnel Management Office under the President Office and paid by the Central Government through the Recurrent budgetary allocations of DOSA;
- NARI (National Agricultural Research Institute) has not been systematically involved in the conduct of divisional extension programmes although it collaborates with the DAO professionally, though mainly at inter-personal levels; and,
- The DAO is professionally and administratively the head of agricultural crop programmes in the division and the Divisional Livestock Officer (DLO) is the head of the divisional livestock programmes. The Divisional Cooperative Officer (DCO) is the head of the divisional cooperative programmes, and all the staff are answerable to their respective directors and with hardly any formal coordination and cooperation among them at the field level.

3) After Decentralization

- The technical line departments of Agricultural Services, Livestock Services and Cooperative Development will be suitably restructured and reduced into Directorates of Technical Services with a spatial administrative structure limited at the divisional level;
- The mandates of these directorates will be limited to technical advisory roles on policy matters to DOSA, overall coordination, regulatory , international cooperation and assisting the Department of Planning in its sectoral investment project and programme planning at the national level;
- The Directorates of Technical Services and NARI will provide a team of Subject Matter Specialists (SMSs) to each of the divisional Director of Agriculture and Livestock Service in number and quality relevant to the agricultural potentials of the division to provide technical backstopping to the extension service in the form of training of Extension Supervisors, Farmer Contact Extension workers and the farmers. They will also serve as the research extension linkage through the conduct of farm level trials in their respective disciplines in collaboration with NARI;

- The staff of the Directorates of Technical Services and their SMSs will be employees of Central Government paid through the Recurrent budgetary allocation of DOSA; and,
- The SMSs will be professionally and administratively responsible to their respective directors of the Directorates of Technical Services and Operationally supervised by the Divisional Director of Agriculture.

2.6.4 Divisional Coordinating Committee

Department of Community Department (DCD) is a line department under the Department of State for Local Government and Lands. At the Divisional level, DCD responds directly to the Divisional Commissioner who is the chairman of the Divisional Coordinating Committee (DCC). DCC, which is supposed to meet bimonthly, coordinates all the development projects in the Division and is composed of five main subcommittees and also includes NGOs and Donors. One of these subcommittees, the Institutional Capacity Building Subcommittee, is chaired by DCD. The Divisional Agricultural Coordinator (DAC) for example, chairs the Agricultural Subcommittee, etc. Appendix 2.3 lists and highlights URD NGO activities in URD, Appendix 2.4 presents URD Institutional Credit in PDP (Package Deal Program) in 2000 - 2003, and Appendix 2.5 presents URD Farmers Organization.

Under the New Decentralization law, DCC will become the Technical Advisory Committee (TAC). This Committee, which will be under the Area Council, will provide the technical advices to the Council. The Area Council will be divided into six main committees consisting of Committee for Personnel, Committee for Finance and Audit, Committee for Agriculture, Committee for Health, Committee for Natural Resources and Committee for Development and Planning. A technical body from TAC will be set for each of these committees to provide technical advices. For example, the present DCD will provide advice to the Committee for Development and Planning on matters related to planning and development. The present DAC will be advising the Committee of Agriculture. Similarly, each of the line departments in the Division will be advising the Committee on matters relating to their activities.

Chapter 3 Existing Conditions of the Study Area

3.1 Natural Resources

3.1.1 Topography

As in most areas in The Gambia River basin, URD is generally characterized by low-lying flat land. Even at the highest point, the altitude rarely exceeds 45 m. The River flows from east to west passing through the centre of the division and dividing it into two parts. The lowlands adjacent to the river comprise of several swamps, which were dried up during the prolonged dry spell in 2002. These were mostly formed during the late Tertiary era (over one million years ago) and are usually referred to as the Continental Terminal. Later, a series of iron-enriched layers (iron-pan) developed within the sandstone.

3.1.2 Soil

Given the limited spatial variability, soils in the Upper River Division have conditions similar to most parts of The Gambia. The soils consist primarily of continental terminal and alluvial soils. Whilst the former are found on the plateau, colluvium comprises deposits of highly weathered detrital sediments made of layers of clayey sand stone with discontinuous beds of quartz gravel, sand and clay. The alluvium soils are hydromorphic and textured comprising of more than 80% silt plus clay. Despite the similarities, differences in morphology and chemical characteristics exist particularly between the upland and lowlands soils.

The soils in URD mainly belong to the soils associations 6[1], 7[2], 8[3], 22[4] and 23[5]. Soil associations 22 and 23 which are characterized by slightly elevated terraces and levees of the flood plain are confined to URD. Furthermore, the lowland soils of URD are free from salinity and potential acid problems. The upland soils in the division are however prone to erosion with gulleys easily visible.

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[1] Soil Association 6 : Upland soils occupying the colluvial slopes of valleys and slopes bordering the flood plains of The Gambia River showing wide variations of drainage conditions. They are intensively cultivated with scattered medium to tall trees.

[2] Soil Association 7 : Upland soils occurring on slopes bordering the flood plains of The Gambia river and its major tributaries often adjacent to association 6. It has a higher proportion of coarse textured soils.

[3] Soil Association 8 : Upland soils which occur on plateau edge usually marked by a more or less pronounced scarp slope capped by outcropping ironpan. They comprise disturbed woodland, shrub understorey, varies from woody fallow to open woodland.

[4] Soil Association 22 : Lowland soils which occur in slightly elevated (high-lying) river terraces of the prior flood plain in Upper River Division. They carry a grassland vegetation with scattered shrubs.

[5] Soil Association 23 : Lowland soils which occur on the elevated levees of the prior flood plain bordering the River Gambia in Upper River Division. They are normally subjected to prolonged flooding and have an open woodland vegetation.

This is attributed to the farming practices such as ploughing along the contour and a land tenure system which places little emphasis on investment in soil conservation practices and structures. Among the above mentioned soil associations, the soils associations 6, and 7, which are consisting of sandy clay or clay, sandy clay loam or clay loam, are more suitable for cultivation.

3.1.3 Water Resources

The largest water source in URD is The Gambia River, whose discharge exceeds 2,000 cusec during its maximum discharge period and is less than 10 cusec at its minimum. The division has the endowment of abundant fresh surface water resources of the River. However, water use from the River is not much due to economic and environmental reasons. Due to the high levees on the banks, obtaining water from the River always requires a pump uplift system.

Groundwater discharge is fed mainly from the River Gambia. In many places, villagers dug shallow wells of between 5 to 20 metres depth and extract water using a bucket and rope system for home use, cattle and vegetable watering. Water availability is the biggest concern in almost all villages. In some villages, there are interferences in the water sources of wells due to digging too many wells in the same vicinity. Over the past 15 years, the water table has generally been reduced by 2 metres due to decreased rainfall and increased extraction. Also, there is a confined water source in the Guinea highlands where many boreholes have been dug in the central and lower river divisions and there are also some boreholes in URD used for village use. Confined water may contain a little fluorine, iron or acidity, but it is often within the permissible range in The Gambia. URD has a big potential for the development of confined water.

3.1.4 Climate

Basse has a 5-month wet season lasting from mid- June to October, with peak rainfall typically occurring in August as indicated in the figure shown below. The average maximum temperature is moderate (30-40^{o}C) throughout the year, except just prior to the rains in April/May, when the average temperature climbs to a little over 40^{o}C. The average minimum temperatures are typically 9^{o}C lower than the average maximum during the wet season, but drop sharply in the dry season to temperatures of 15^{o}C in December and January. The average mean relative humidity follows the same pattern as the rainfall, reaching its maximum of a little over 80% in August/September, around the period of maximum rainfall, and drops to its minimum of 25-45% between the dry periods of December to March.

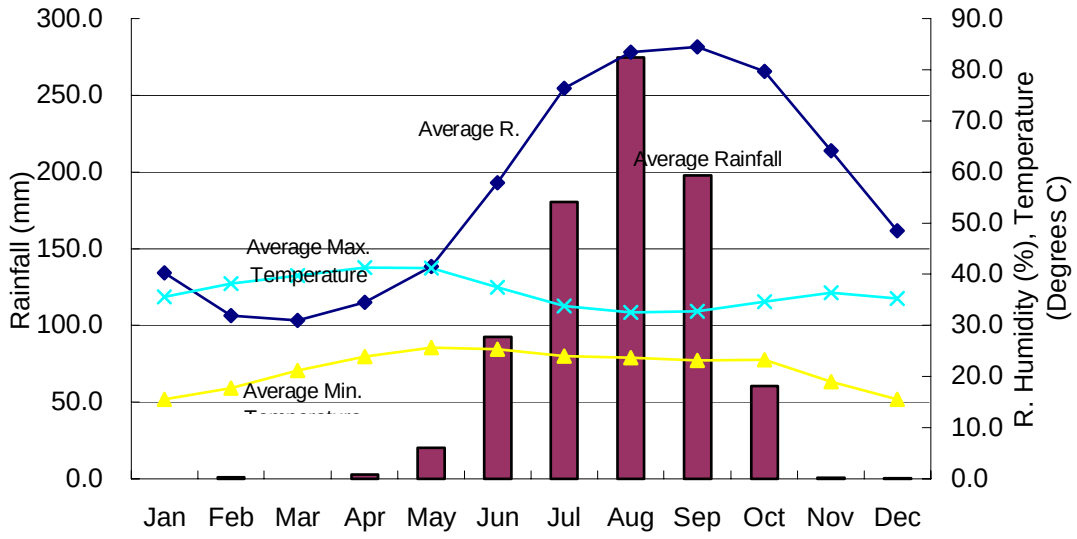


Fig 3.1 Salient Climatic Features at Basse during 1972 to 2000

3.1.5 Erratic Climate and Natural Disaster

Recently, The Gambia including URD had experienced some losses to agricultural production due to erratic climate situation at least three times nationwide. These were:

(1) Torrential rains and floods 1999/2000

During the months of August and September 1999, torrential rains were experienced particularly in the CRD and URD causing damage to crops. The damage was the most severe to seedlings and irrigation and conservation infrastructure which were submerged under water for several days. The seedlings were rotten and the infrastructures were washed away. In some extreme cases as in the Sutukoba area in Wulli, Upper River Division, hail storms were experienced destroying both the cereal and groundnut crops.

In response to the above natural calamities, government and NGOs fielded assessment teams which determined the extent of the damages. Subsequent to this, assistance was provided from local businessmen, NGOs, Government and donors in the form of food aid assistance and rehabilitation of infrastructure and livelihoods. Thus, rice irrigation and conservation infrastructure, watering points for livestock, drinking wells and horticultural facilities were rehabilitated. In addition, seeds, watering cans and other small tools were provided to victims.

(2) Prolonged dry spell in 2002/2003

This agricultural season experienced the late arrival, irregular and insufficient rains in most parts

of the country. At the onset of the rains in June and up to July 2002, only a few areas had sufficient moisture for seedlings establishment. The low rainfall situation persisted ranging from 4 to 8 weeks depending on the locality and was not favourable to crop establishment and development. It was only later in September that sufficient rainfall was experienced. Rainfall for the year was only about 67% of the normal year.

Table 3.1 Comparison of Rainfall

(last 4 years with long term mean (1st May-20th October)

Station & Division	Normal	1999		2000		2001		2002	
	mm/y	mm/y	%	mm/y	%	mm/y	%	mm/y	%
Banjul	810.0	1045.2	129	1119.7	138	946.6	117	462.7	57
Serre Kunda	811.0	1013.1	125	1076.3	133	864.9	107	846.4	104
Western									
Yundum	862.0	1184.6	137	970.7	113	867.3	101	686.7	68
Jambanjelly	817.0	1628.4	199	1181.9	145	1085.7	133	716.5	88
Sibanor	881.0	1358.4	154	1002.9	114	1095.2	124	646.4	73
North Bank									
Kerewan	775.0	1079.6	146	1022.0	138	891.7	115	616.6	80
Yalal	720.0	1267.1	176	860.8	120	616.5	86		
Lower River									
Jenoi	738.0	1079.6	146	1022.0	138	818.7	111	364.9	49
Karantaba(kiang)	922.0	1132.1	123	814.6	88	911.4	99		
CRD North									
Kaur	669.0	1055.0	158	754.5	113	839.0	125	596.5	89
Kuntaur	622.0	999.6	161	786.2	126	641.1	103	489.7	79
CRD South									
Sapu	779.0	1745.7	224	1307.2	168	963.2	124	485.0	62
Janjangburey	747.0	1137.0	152	565.5	76	763.2	102	490.1	66
Bansang	709.0	1161.9	164	663.1	94	505.0	71	590.9	83
Saresofi	762.0	1360.8	179	..	..	692.7	91	635.9	83
Upper River									
Basse	835.0	1374.2	165	832.7	100	614.5	74	731.2	88
Fatoto	746.0	1179.8	158	638.3	86	679.6	91	622.4	83
Country Average	776.8	1141.8	147	909.1	117	812.6	105	522.5	67

Source: Joint CILSS, FAO and WFP Report, October 2002

Note: Rain % values of less than 75% is below normal, 75% to 125% is Normal, and greater than 125% is above normal.

The situation resulted in poor germination of planted crops; and for those that germinated most experienced stunted vegetative growth and wilted. This culminated in halfing the output of groundnut production and a drop by nearly a third for other crops. The effect on the economy was a decline in the GDP by more than 3%.

In response to the prolonged dry spell, the Government in August, 2002 declared a natural disaster, and sought assistance from both the local and international community to alleviate the suffering of

the farming community. The Government with the assistance of the international community (European Union, World Food Programme, Food and Agriculture Organization of the United Nations) conducted assessments to determine the extent of the damage. The assessments highlighted the decline in output of crops and livestock and the consequent adverse food and seed situation; the price hike in cereals at the various markets; the limited fodder available to livestock and the extended period for the lean period (sometimes called as the hungry season-when food and cash stocks are both very low and families adopt coping strategies).

Local funding (general population and businessmen) NGOs, and donors provided assistance in the form of food aid, seed support, horticulture and rice development.

(3) Invasion of desert locust 2004/2005

The invasion by swarms of desert locusts from Senegal occurred in December 2004; when most of the field crops had already been harvested. The immature insects landed sporadically in pockets in various parts of the country (NBD, CRD, LRD and URD) and caused some minor damage to foliage and nurseries. The damage has mostly occurred on flowering mango trees and a few nurseries in NBD.

In response to the invasions, the government has undertaken sensitization campaigns and established divisional coordinating teams all over the country, has sought and received assistance from the FAO and other regional organizations for both ground and aerial spraying. This measure has largely contained the situation.

3.1.6 Land Use

Land use as indicated in Table 3.1.2 below shows the cultivated land in URD to be 48,800 ha, almost 24 % of the total land. Pasture/ grassland covers 7 % (14,800 ha) of the land, whilst the forest area covers 6 % (12,800 ha). Accordingly there is still arable land (fallow) of 12,400 ha (6 %) left for crop cultivation.

Soils in URD generally show red to brown coloration comprising of typically sandy to sandy silt soil. Some clay soil is however found in swamp area, where farmers mostly grow paddy.

Table 3.2 Land Use in URD and The Gambia

	URD	The Gambia
(1) Cultivated Land	48,800 (24%)	241,200 (21%)
(2) Fallow area	12,400 (6%)	89,200 (8%)
(3) Pasture/ Grass land	14,800 (7%)	85,200 (8%)
(4) Trees & Shrub Savanna	100,400 (49%)	360,000 (32%)
(5) Woodland	12,800 (6%)	100,800 (9%)
(6) Mangroves	800 (1%)	59,600 (5%)
(7) Others (housing, road, river etc.)	12,400 (6%)	195,600 (17%)
Total	202,400 (100%)	1,132,400 (100%)

Source: 1993 Forestry Survey; Monitoring of Land Use Change in The Gambia.

3.2 Rural Society

3.2.1 Population

URD is divided administratively into 4 districts and 14 wards. Villages are the smallest administrative units under the wards, and there are 377 villages in the Division. The 2003 census data released by the Department of Central Statistics and indicated in the table shown below put the population of URD at 183,033 people in 8,156 households. Out of this population, 15% live in the urban area whilst 85% live in the rural area. In the period of ten years during 1993 - 2003, the population of URD marked an annual increase of 1.67 percent.

Table 3.3 Districts and Wards in URD

District (4)	Sandu	Fulladu East	Wulli	Kantora
Ward (14)	Diabugu Missira	Julangel Gambisare Sutukonding Basse Sabi Dampha Kunda	Kulari Sare Ngai Baja Kunda Foday Kunda	Garawol Koina
Villages (377)	—			

Table 3.4 Population of URD (2003) and Number of Households

Region			Population (People)	Households
Gambia, nationwide			1,364,507	69,140
	URD		183,033	8,156
		Sandu	18,321	1,120
		Fulladu East	98,454	4,374
		Wulli	35,856	1,546
		Kantora	30,402	1,116

Source: National Population Census 2003 for population and National Agricultural Census 2001/2002 for households

The 1983 Population Census reported that approximately 16% of the residents of Basse, the divisional capital, were non-Gambian, who were mainly from Guinea-Conakry (66%) and Senegal (19%). Due to conflicts in the sub-region, URD has been receiving refugees from the Casamance

region of Senegal, and from Sierra Leone. As it is evident in most developing rural communities, many young people migrate seeking for work in the capital, Banjul, or overseas in search for better living. Migration abroad is particularly common among the Serahuli tribe.

3.2.2 Ethnic Groups

The Gambia has at least 10 ethnic groups, of which the major ones are Mandinka (42%), Fula (18%), Wollof (16%), Jola (10%) and Serahuli (9%), and 5% of other groups. URD however, has three main ethnic groups comprising of Mandinkas (37%), Serahuli (37%), Fula (24%) and 2% of other groups. The Divisional capital of URD, Basse, is said to be a transit point between Casamance and Tambakunda in Southern Senegal, consequently the way of life in the area is influenced by resident Senegalese to some extent. The employment patterns, and therefore the ways of life, of the ethnic groups differ, but their traditional cultures are homogenous, with many similarities in beliefs, customs and taboos.

The main livelihood and cropping patterns differ among the ethnic groups. For example, the Mandinkas were mainly growing paddy rice and coarse grains and groundnuts, the Fula follows normadic culture and mainly raise livestock and the Serahuli grew coarse grains and were commonly engaged in trading or non-farm activities. However recently many Fula have now settled and practice crop cultivation, and Serahuli grows coarse grains, groundnuts and rice, and hence the traditional ways of living are changing.

3.2.3 Social Structures(household and family)

Unlike the heterogeneous social set-up in the urban areas, the rural areas are characterized by a more cohesive and homogeneous social set-up within the framework of socio-cultural and social units. At the community level, these units are village, kabilo, compound and family as described below:

a) Village

The village is the social pattern of settlement in rural area. A village may be a mixture of tribes with one tribe usually dominating; usually the original founder or descendants of the original founders. A typical Gambian village is sub-divided into kabilo and compounds.

b) Kabilo

The kabilo (in mandinka) may be a small or large number of compounds with same patrilineal kinship though outsiders can be easily accommodated into the kabilo such as strange farmers and civil servants renting within the kabilo.

c) Compound (residential unit)

Unlike the kabilo the compound is a clearly-defined and fenced area with either a house/hut for residential purpose. It is headed usually by the eldest man of the founding lineage in the compound and has socio-economic and religious powers over the family. In rare cases, female members become compound head. Within the compound, there are two distinct units: Production and consumption unit.

The production unit of the compound is commonly known as a “dabada” a Mandinka word. A dabada is a semi-autonomous work unit of the compound, which comprises of a group of people working and pooling their resources together. The introduction of the dabada system in the compound led to the fragmentation of the cohesive family structure in the compound. However, the dabada head is usually bestowed with the responsibility of distributing land to members, and retains the control over social and religious functions. The head also influences the decision associated with the economic welfare and labor utilization. The dabada has undergone a series of structural changes and the degree of these changes varies substantially from one village to another.

The consumption unit comprising of a group of people who eat together from the same cooking pot is called as “sinkiro”. If the head of the sinkiro has more than one wife, then the wives cook the various meals of the sinkiro on a rotation basis. Some sinkiros have complex social structures comprising of the extended family members. While others have simple structures constituting the nucleus family members.

d) Family system (nucleus and extended)

In the broad term, the family system in The Gambia can be classified under two systems, viz. the extended family system and the nuclear system.

1) The extended family system in The Gambia is followed in both urban and rural areas. This system is a network of members of the households comprising the father(usually head of the households), wife(s), sons, daughters, parents(of the head and wife(s)), grandparents, uncles, aunts and even outsiders(strangers). The size and composition of the extended family largely depends on how wide and how closely the family members are associated with each other. The cordial interrelationship among the family members is a prerequisite for the optimal functioning of the extended family system, and the main advantages acquired from such a system include (i) large family relatives from whom one can learn, consult, and seek assistance particularly, (ii) with its size and composition, members of this system have a wide variety of skills and talents which can be used for the welfare of the extended family.
2) The nuclear system is narrower in scope comprising of the immediate relatives. It may

consist of the father, wife(s), sons and daughter of the family. The pattern of social differentiation in The Gambia is tending to towards this system.

3.2.4 Village organizations

Villages are led by village headmen and often comprise of a number of extended family compounds. Each compound belongs to a clan or neighborhood. Village decisions were taken by a gathering of clan headmen/elders. Recently a shift in decision-making authority to the compound heads has been reported.

Apart from the social setup within the residential unit – a compound, other social groups at village level exist. These social groups are known as 'Kafo'. They are groups of people organized by generations and gender or mixed sex usually of common interests. Kafo are found in all villages in the rural area, and membership is sometimes automatic for resident members of a particular village. These local groups may be broadly categorized under two sub-headings: (a) traditional groups, and (b) modern groups often named after their objective functions.

a) Traditional Groups

Traditional kafos comprise of indigenous groups in a village. They may be age and gender specific organizations. For instance, a village kafo can have the following age specific groups: (i) elderly groups, (ii) middle-aged groups and (iii) youth groups.

Many villages have organized Kafo for group economic activities. The wide-ranging activities of Kafo include vegetable cultivation, small ruminant fattening, poultry raising, savings mobilization often with support from NGOs and other bodies including projects. Government and NGOs channel their rural development interventions through these traditional kafos to get maximum output. The traditional village kafos traditionally pool their resources from membership fees, subscriptions and/or income accrued from group labor.

b) Modern Groups

Modern kafo are created purposely to undertake certain demand-driven tasks prior to external (outside village) interventions. The scope of external interventions may cover all forms of rural development activities including agricultural production activities. In URD, there are commodity organizations mainly for groundnut, cotton and maize growers. Most of these are however weak both in terms of organizational capacity and financing. The maize growers association was restructured in 2002. The rational of the association is to promote certain agricultural products, accomplish certain tasks and protect the interest of its members in any bargaining process. The composition of the association may transcend a number of village

boundaries and even districts.

As a more modern organization, many villages have Village Development Committees (VDC). The organization of VDC is being spearheaded by the Department of Community Development (DCD) and funded by the European Union, as a part of the process of decentralization. The committees were first introduced in the 1980s, but did not function effectively. They however, have an important role in village development, and act as the first contact point for external organizations. The Ward Development Committees (WDC) are the next organizational level above VDCs. These committees comprise of a cluster of villages with membership drawn from two representatives from each village.

3.2.5 Economic activities

Agriculture, centering on crop cultivation, is the most important source of livelihood for most of the residents in URD. The main occupations in the division according to the Agricultural Census (2001/2002), are classified as described in the table shown below. Approximately 92% of residents indicated that agriculture was their primary occupation, followed by waged labour for 7%. As the secondary occupation, 59.5% indicated waged labour and 21.7% wholesaling/ retailing. These results indicate that people work in these secondary occupations in ways that support agricultural work as the primary occupation. Approximately 28% of women combine sales in local markets and elsewhere with their agricultural work.

There are two regular daily retail markets in URD, as well as six local weekly markets. The markets trade fish and utensils from Banjul, the capital, as well as vegetables, beans and agricultural tools from Senegal.

Table 3.5 Main Occupations in URD in %

	Agriculture	Processing	Wholesale/ retail	Government	Artisan	Waged laboring	Other
Primary	92.5	-	0.2	0.4	-	7.0	0.8
Secondary	2.3	0.6	21.7	0.5	9.1	59.5	6.3

Source: National Agricultural Census 2001/2002

3.2.6 Land Tenure systems and land ownership

The 1990 Lands Act formalized traditional land use systems. The same act simultaneously placed all land under the jurisdiction of district authorities. The traditional land use system is strongly rooted in rural areas. It is complex and may differ depending on local conditions, gender and land type (forests, farm land). Basically, the land within a village belongs to the village, with usage rights being assigned to the inhabitants. Land is divided between common use and private use, depending on its use. Land allocation is determined by the village and clan headmen. Village

discussions are required on the use of unused land and common land. Although farmers are gradually moving away from traditional land use systems, land allocation is still mainly in the hands of clan headmen. Data from the Agricultural Census earlier quoted, indicate that for URD, 4% of land is owned by villages, 44% by clan headmen, 40% in private ownership and 12% rented land.

3.2.7 Farm Economy and Poverty Line

According to data on income sources from the Participatory Poverty Assessment for URD 1999-2002 as shown in Table 3.2.4, the most important source of income for both dry and wet seasons were farming over 50 %, followed by remittances about 9%, others 8 % and petty trading. There is some evidence of seasonality in the sources of income e.g. more remittances is received in the wet than dry season for all the three years of the survey. It is also evident that petty trading brings more income during the wet season. In the case of farming, it is not very conclusive from the survey data.

Table 3.2.4 indicates the mean annual income per adult equivalent unit (AEU) in rural areas by division and shows disparity amongst the divisions. URD emerges with the second highest income of D3,553 AEU after WD's D4,975 AEU. It also glaringly indicates that income levels in all rural areas are below the national average income of D 5,926 AEU.

Table 3.6 Sources of income in URD in %

	1999	2000		2001		2002
	wet	dry	wet	dry	wet	dry
Remittances	10.00	9.50	12.50	10.10	10.10	6.75
Employment	1.50	2.30	2.80	6.20	6.20	5.20
Petty Trading	7.50	6.50	5.90	5.15	5.15	3.60
Cottage Industry	1.25	5.90	2.50	-	-	6.85
Farming	60.00	48.90	50.40	53.80	53.80	55.50
Skilled labour	13.00	5.90	6.40	3.30	3.30	4.15
Gardening	-	6.50	8.90	5.80	5.80	2.90
Unskilled labour	-	3.50	-	2.85	2.85	3.54
Marabout work	2.00	-	-	2.50	2.50	2.33
Sale of livestock	-	-	-	1.70	1.70	3.13
Business	2.00	-	-	2.80	2.80	-
Others	4.75	11.00	10.60	2.00	6.50	9.00
Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: Participatory Poverty Assessment for URD 1999- 2002

Table 3.7 Mean Income (in Dalasi per year per AEU) in Rural Area by Division

Region	WD	NBD	LRD	MID	**URD**	Average
Income per AEU	4,975	3,466	2,935	3,445	**3,553**	5,926

Source: Household Economic Survey 1998
Note: AEU; Adult Equivalent Unit

The Table shown below on Human Development Index (HDI) and poverty level by division shows that the poverty rate in URD is high, at 73%, and the HDI stands at 0.216, the lowest level in The Gambia. The Human Development Index computed for The Gambia for the last 5 years, places it amongst the World's 10 poorest countries.

Table 3.8 Human Development Index and Poverty in Each Region

Region	Gambia	WD	NBD	LRD	CRD	**URD**
Human Development Index	0.363	0.321	0.246	0.246	0.246	**0.216**
Below the absolute poverty line (%)	37	50	71	71	62	**73**

Source: Human Development Plan 2000, Household Poverty Survey 1998

Table 3.9 Expenditure in URD in %

	1999	2000		2001		2002
	wet	dry	wet	dry	Wet	dry
Food	53.75	63.5	55.30	46.00	53.15	53.33
Education	5.50	8.1	6.90	9.50	8.15	10.59
Clothing	14.00	11.4	13.80	15.00	11.90	13.58
Health	12.25	12.3	14.60	13.40	15.95	13.87
Ceremonies	2.00	1.5	-	4.10	3.75	2.88
Tax	1.25	-	2.00	6.00	3.60	1.24
Shelter/rent	1.50	-	1.00	1.00	0.90	0.38
Jewelry	-	-	1.00	0.20	-	0.09
Remittance	-	-	3.40	2.00	0.15	0.19
Livestock Purchase	-	-	-	1.00	0.25	0.68
Energy	-	-	-	0.10	-	-
Farming Inputs	0.75	-	-	1.00	0.95	1.43
Saving	-	-	-	0.30	-	-
Others	-	3.2	2.0	0.20	1.85	1.50
Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: Participatory Poverty Assessment for URD 1999- 2002

The above Table of Expenditure from the Household Economic Survey 1998 for URD, indicates the highest expenditure to be on food, consuming an average 54% of household expenditure. This is followed by clothing 13.28%, health 11.42% and education of children 8%. The lowest expenditure items include energy, savings and purchase of jewellery.

3.2.8 The Role of Women in Agriculture

The sexual division of labour in The Gambia is based on ecology and hence on crop rather than tasks. Traditionally, men grow upland crops comprising of coarse grains (millet, sorghum, maize) for subsistence as well as groundnuts and cassava for cash, while women cultivate rice primarily for subsistence and also for cash. Where rice lands are scarce, women grow more upland crops but not on the same field as men. Labour exchanges between men and women exist, but are relatively rare because both are fully tied up with their own activities at the same time.

Figure 3.2 shows the gender mix among cultivators of major crops. It indicates that a higher proportion of women in URD is involved in the production of groundnut, a cash crop, which is not the case in other divisions of the country. Conversely there is less cultivation of sorghum, millet and other grain crops. This is attributed to the food habits, as families consume mostly coarse grains, the men devote most of their area to these and the women grow groundnuts as a cash crop, and also to make soup. The other factor is the limited access to rice fields, and hence the growing of groundnuts. There is again a marked difference from other regions. The traditional gender roles in URD are for men to grow staple crops and women to grow cash crops.

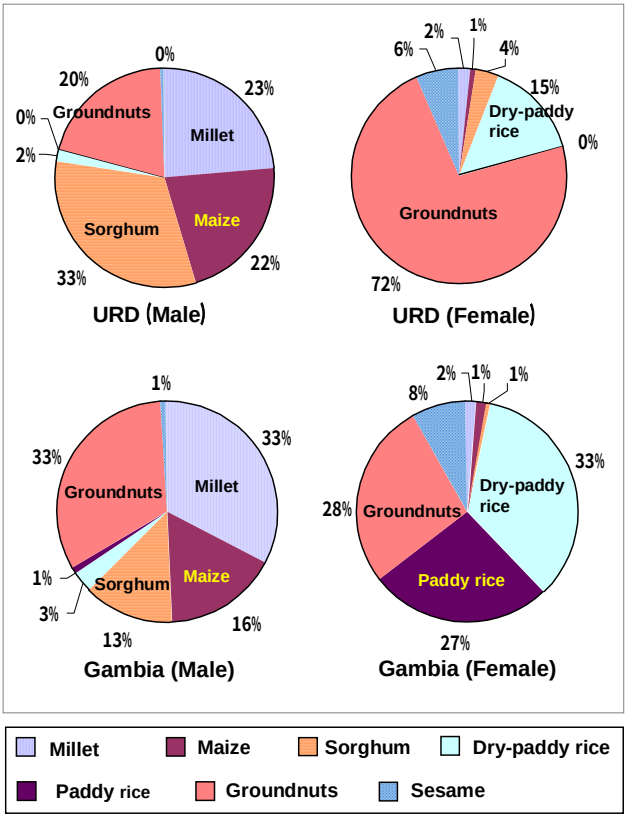


Figure 3.2 Division of Labour by Sex

3.2.9 Coping Strategies of Farmers

Farmers in URD adopt coping strategies for the hungry season when food stocks are low and cash reserves are low for the purchase of essential foods. This is also the time when energy requirements are high given that activities such as weeding, planting etc. are carried out during this period.

During the hungry season, typically lasting from July to September, food stocks at farmer level are low and the diversity of food sources is limited. Farmers, however, adopt a number of strategies including the following:

- Changes in cropping pattern and diversified planting practices e.g. tending into early maturing and less risky crops and diversifying the crop mix resulting in shift of women in URD growing more groundnuts;
- Inter-household transfers and reliance on kinship ties and other social networks of friends which provide mutual support, which could be in the form of remittances from within or abroad;

- Sourcing and consuming of forest products such as fruits, leaves, roots and game;
- Disposal of productive/economic assets including livestock, household items, farming implements etc.;
- Reduced consumption by families e.g. skipping meals and reducing rations to members;
- Participating in food for work by the WFP or being recipients of other government food aid programs;
- Provision of hired labour and off-farm work to generate revenue for the purchase of food and other essential items;
- Storage of crops at household and community levels e.g. cereal banks.

3.3 Administration Organization

3.3.1 Divisional Agricultural Office

(1) Role of Divisional Agricultural Office

The divisional agricultural office manned by the DAC, Assistant DAC and training officers are located at the divisional level. This team is supported by a team of SMSs which ideally should comprise of a representative of each of the specialized units of Agricultural Communication, Horticulture, Food and Nutrition, Agricultural Mechanization Soil and Water Management and Agricultural Pest Management and, a team of support staff. The team of support staff should ideally include accountants, storekeepers, secretaries, tradesmen, drivers, messengers and watchmen.

The district level supervisory team is a one-man team comprising of a District Extension Supervisor (DES) supported by a two-man team of animal traction trainers comprising of an Animal traction Instructor (ATI) and an Assistant Instructor (AI). The team of animal traction trainers conducts the village level animal traction training and tends the crops and livestock of the District Extension Centre (DEC). The number of teams of animal traction trainers in an agricultural division depends on the number of districts in the division.

The village level extension worker is the last layer in the hierachical arrangement of staff in an agricultural division. Ideally there should be a VEW (Village Extension Worker) for every 250 – 300 farm families. Thus the number of VEWs in an agricultural division depends on the size of the farming population in theory.

(2) Extension Service by DAS

1) Activities of DAS at URD

The Divisional Agricultural Office (DAO) in URD is headed by DAC. The DAC is assisted by an

Assistant DAC and 4 SMSs. The office also houses AMU (Agricultural Mechanization Unit) and has 4 volunteers comprising of three ladies, two of whom want to become extension workers in the future (refer to Appendix 3.1).

The SMSs provide specialized services. The SMS Horticulture supports the vegetable and fruit gardening interventions and also compiles reports from each DEC in the monthly report. The SMS Soil and Conservation is in charge of accounting of the office, in addition to the soil and water conservation assignments. The SMS Production concentrates his effort on swamp rice production, though the authorized data are not yet completely obtained. The SMS Pest management carried out a spray campaign against locusts in the end of July 2003 and throughout the crop season of 2004. These were done through the cooperation with the Agricultural Pest Management Unit of DAS at Yundum.
The function of technical staff of DAO is summarized below.

Table 3.10 Function of Technical Staff of DAO

Position	Function
DAC	-Coordination of all agriculture (crop) activities in the Division. -Organize training for staff at divisional level. -Liaise with other institutions at divisional level
SMS	-Organize and coordinate training on the specialized area to farmers or other extension staff. -Supervise activities related to the specialized area
DES	-Supervise VEW's to conduct farmer training -Supervise the activities of the DEC -Supervise work at the DEC farms
VEW	-Work directly with farmers on their activities -Conduct village -based farmer training -Be members of the MDFT

The current mobility and machinery situation of the DAO is as follows:
The only available vehicle is the pick-up used by DAC. The Pajero of the assistant DAC is out of order. Two (2) tractors units out of 13 units are under repairs. 10 units are allocated to MFCs with two each. Ploughing service provided during the season of 2003 is at only 400 ha due to the poor income status of farmers.

2) Activities of the DEC

Five DECs (District Extension Centers) also known as Mixed Farming Centers (MFC) and 1 sub-branch at Sotokoba exist in the Division. The Head of the MFC is the District Extension Supervisor (DES). 4 VEWs out of 14 have no motorbike, and 9 motorbikes including those for 4 SMSs are old. Although the fuel allocation per motorbike is supposed to be 20 liters every 3

months, funds available to the DAO is limited, and does not cover the fuel and maintenance costs.

a. Extension methods and targets

The extension activities are carried out at six centers (one is a sub-branch), each with 1~2 VEWs, under the guidance of DAO (SMSs). Extension activities do not cover the whole region, serving only 30~40 % of villages, and many villagers revealed that they had not received visits by VEWs to their villages for as long as ten years.

The extension method may involve Training and Visit (T&V) concerning Package Deal Programme (PDP) and vegetable gardening. Each VEW has five contact farmers in each village he or she covers. Normally each VEW covers 12 villages. Recently, it became common for farmers to visit extension branches or VEWs. Meetings with farmers at the branches are held under large trees.

Each extension centre has 2 to 2.5 ha of farmland for extension and demonstration purposes, but the use of this land cannot be described as effective. There are demonstrations of operations such as animal drawn ploughing, sowing and weeding. The dissemination of early maturity seeds of groundnuts has been an important task.

Farmers in villages are organized into compounds, which are groupings of 3 to 7 households based on blood ties.

b. Content of the extension activities

The action plan of the DAO for 2002 contains specific extension activities covering general production techniques, like crop density, crop rotation, weed prevention and removal (on 370 ha in 140 villages), Package Deal Programme (500 ha in 50 villages), tractor services (400 ha), vegetable gardens (39 ha in 30 villages) and pest management (grasshoppers on 142 ha). It also incorporates joint extension activities from various aid agencies and NGOs.

Maize and millet which have a higher response to fertilizer application, are popular under PDP. Extension in the use of vegetable gardens does not include instructions on the application of organic manure. The extension activities have become diversified according to farmers' needs, but they seem to be executed without coordination among them.

c. Points to note in extension activities

As mentioned before, there are only 20 staff under the DAO comprising the DAC, Assistant DAC,

4 SMSs and 14 extensionists (6 center heads and eight extension workers). With these limited number of staff, all official extension services related to agriculture must be provided for 38,000 households in 370 villages with 50,000 ha of agricultural land in URD, and thus, they face serious staffing and budgetary problems.

3) Credit and Farm inputs

The DAO has engaged in promoting the Package Deal Program (PDP) for farmers through the 5 MFCs. This is a kind of institutional credit system which provides seeds and fertilizer (Urea/ Compound15-15-15) complemented with technical advice. 198 farmers were involved in the PDP for the 2001 cropping season. The results indicated maize registering 56 % yield increase due to the PDP (Average 20-25% increase). The PDP for the 2002 cropping season was predominantly for maize (45 %) with 291 farmers and covering 415 ha. However, most of the maize cultivated, except for Giroba Kunda MFC, failed because of the drought and the limited moisture in July 2002. The PDP for the 2003 season covered only seeds with fertilizer provided on cash sale. This program has encountered difficulties in providing fertilizer, since the price of fertilizer has risen significantly, almost 200 % compared to the previous year.

3.3.2 Divisional Livestock Office

(1) Role of DLS

The Office is constituted by 1 Divisional Livestock Officer (DLO), 1 Assistant Divisional Livestock Officer (ADLO) and 11 Livestock Assistants (LAs). Actually, LAs are supposed to be posted to each ward, and therefore 14 of them are required to be in URD. Their main task is to improve the health situation including production and productivity of livestock in the division, which can be broken down to clinical interventions, disease control, veterinary public health, and implementation or support to projects/programs in collaboration with other institutions and NGOs.

(2) Extension Services by DLS

Through Divisional Livestock Office, the following activities are carried out:

1) Clinical Interventions

In 2004, the office staff together with the field staff carried out more than 10,000 clinical interventions such as castrations, spraying and clinical treatment for gastrointestinal tract disorders, respiratory tract disorders, reproductive and urinary tract disorders, and wounds. Other disease conditions treated included foot rot, lice, tick infestation, trypanosomiasis and epizootic lymphangitis.

2) Disease Monitoring and Control

They also provide services to detect some of the most problematic diseases within the division and preventing their spread by vaccination, although this area of service is limited by insufficient supply of vaccines as well as the low turnout of livestock owners. Poor cold chain facilities have also led to coverage being limited to only a few areas in the division. For the two most problematic diseases in the division which are Pests des petites ruminantes (PPR) and Newcastle diseases (NCD), a vaccination campaign has to be continued to reduce the cases.

3) Veterinary Public Health

As part of the department's mandate, the office is to ensure people are free from infectious, toxic and physical hazards which may be originate from consuming animals. Slaughtering and inspection are done under poor conditions, for which recommendations of improving the conditions are always proposed by the office to the DCC.

4) Project / Programme

The office is working with several projects recently; Pan African Control of Epizootics (PACE) – Gambia, Pure Breeding Programme (PROCOORDEL), and the forth coming Natural Resource Management project by OMVG.

Table 3.11 Related Activities by Other Organizations

PACE	This is involved in the diagnoses of animal transboundary diseases by the office staff and support to formation of village based surveillance committee for the diseases.
PROCOORDEL	The programme's objective is to verify the financial benefits from trypanotolerant ruminant livestock rearing through increased productivity. Only Sandu district is now being covered, where two village, Missira and Kuwonkubato were selected as the target area. Other activities include provision of vaccination, fencing materials for intensive feed garden and seed of Moringa.
Natural Resource Management (OMVG)	The project is to start up in 2004/2005 involving the neighboring countries, Guinea Bissau, Guinea and Senegal. URD is selected as the target in The Gambia. The objective is to increase agro forestry and pastoral output, rationalize tapping of the natural resources and improve the infrastructures and social services in the division.

5) Support to Livestock Owners' Association

There are several livestock related associations recently set up through the support of the DLS. One of them is The Gambia Indigenous Livestock Multipliers' Association - Fulladu (GILMA-Fulldu), now being active in the domain of providing loan of improved breeding stock to farmers. Others are Livestock Owners Association and URD Poultry Farmer's Association. The office has been encouraging these associations through their technical advice and services

provided.

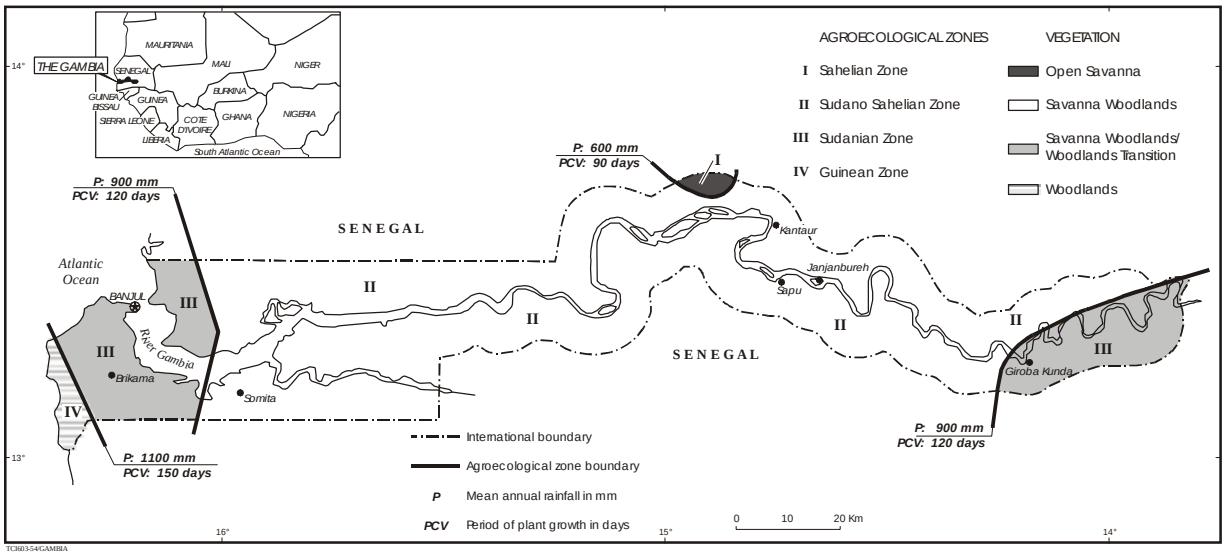
3.4 Crop Production

3.4.1 Agro-ecological Aspect and Locality of URD Agriculture

Based on the rainfall pattern, there are three main agro-ecological zones namely: Sahelian, Sudano-Sahelian and Sudano-Guinean zones in The Gambia. As shown in the following Agro-ecological map, the south-eastern part of URD including Basse town and parts of the Western Division is classified as the Sudan-Guinean Zone. The other part of URD is classified as Sudan-Sahelian Zone similar to some parts of the Central River Division.

(See the map below and Appendix 3.2)

Figure 3.3 Agro-ecological zone in The Gambia



Source: The National Agricultural Research System of The Gambia: Proposal for a Medium Term Plan, 1998, FAO

The above mentioned two agro-ecological zones are summarized as follows:

- Zone II: Sudan-Sahelian Zone has an average rainfall of 600 to 900 mm per annum and a growing season of 79 to 119 days, which is suitable for groundnuts and sorghum. Geographically, the majority of rural areas in the country fall into this AEZ.
- Zone III: Sudanian-Guinean Zone lies within the 900 to 1,200 mm rainfall isohyets and a growing season of 120-150 days. Geographically, the most humid areas of the country are coastal areas of Western Division near the river mouth and at the opposite end of the river in Upper River Division.

3.4.2 Crop Production System

The major crops grown in the area include groundnuts, sorghum, early millet, maize, late millet, upland rice, findi and vegetables. There has been a shift from the cultivation of long-duration crops to short-duration crops due to reduced rainfall. The farm production unit, locally called the dabada, is the main source of family labor supply, with other sources of labor provided by migrants (strange farmers) during the rainy season and dry season. The dabada produces both cash and food crops needed for the family subsistence. Strange farmers, who also provide dry season labor, usually come to lift, thresh and winnow groundnuts. Women are normally responsible for the cultivation of rice, vegetablse, and groundnuts, and men are responsible for the cultivation of the upland crops (sorghum, millet and maize). Among the upland crops, the groundnuts production system in URD differs from the other divisions, and women in URD can manage as evidenced in the baseline survey.
Traditional groups, called Kafo, based on age and gender, work in rotation on each other's field. They are now becoming very popular, and NGOs and donors use them in the implementation of development projects.

The production system in URD is mostly categorized into the semi-intensive system. This is an improvement of the traditional rain fed system, with the use of animal traction and the integration of crops and livestock. Some characteristics of the system are: relatively high cattle population, mixed cropping, and use of local varieties as well as greater interaction between crop and livestock production (and manuring). Soil fertility and production levels are maintained through various crops rotation patterns, involving cereals and groundnuts, and manuring for coarse grains. Further to the above mentioned system, some areas or farmers are introducing the fully mechanized systems to produce upland crops.

According to Agricultural Census 2001/2002, about 90% of male farmers practice animal traction for ploughing and seeding, while almost no female farmer follows such practices. Main source of seed are reserved from their harvest in the previous year, which counts for 94 %. Other sources are distribution by NGO and seed credit from the government. It is difficult for farmers to obtain appropriate fertilizer in the area.

3.4.3 Major Crop Production

According to the data, the yield of most crops is around 1 ton per ha, producing 48,000 tons from 43,000 ha according to averages of the last 5 years. Groundnut occupies almost half of the total crop area. It can be said that sorghum and maize production are relatively more than the other divisions, which is indeed one characteristic of the upland production in URD. The data on swamp rice are not available in the statistics, and according to the estimation of Subject Mater Specialist

for the crop in DAC office, about 1,000 ha is annually put to swamp rice in URD.

Table 3.12 Major Crop Production (1998-2002; Average)

	Crop area (ha)	Production (t)	Yield (kg/ha)
(1) Groundnut	19,271 (45%)	20,839 (43%)	1,081
(2) Maize	4,802 (11%)	7,101 (15%)	1,479
(3) Upland Rice	368 (1%)	437 (1%)	1,186
(4) Early Millet	6,098 (14%)	5,706 (12%)	1,065
(5) Late Millet	3,007 (7%)	3,026 (6%)	1,065
(6) Sorghum	9,581 (22%)	11,174 (23%)	1,065
Total	43,123 (100%)	48,274 (100%)	1,116

The cultivated area according to crops and cattle ownership for the 3 villages for the past three decades and the present decade are shown in Table 3.13. This is to grasp how farmers cope with agro-ecological changes for upland crop production during the last three decades. The 10 stones method is also used to compare the present situation with the past fixed on the ten stones. Village elders were targeted as respondents during the interviews and discussions since they have more experience on the agro-ecological changes in the villages.

The results indicate a general increase in the cultivated area and cattle ownership, although it varied among crops and villages. According to the data, total cultivated area increased in all villages by at least 2 folds (2 folds for Touba and Jaka Madina and 3.5 folds for Mansajang). In terms of the main cash crop (groundnut), the principal food crop in the diet (millet), maize and vegetables, there were increases of at least 2 folds in all 3 villages (except 1.5 for groundnuts in Mansajang and 1.5 for vegetables in Jaka Madina). Cattle ownership decreased in Touba (from 10 to 8) but increased significantly in Mansajang (4.5 folds) and Jaka Madina (2.5 folds). Mixed results were reported particularly for rice, fonio and sorghum amongst the villages.

Table 3.13 Changes in Cultivated Area and Amount of Cattle Owned on farmer's awareness during the last three decades

Villages / Items	Touba		Jaka Madina		Mansajang	
	Past	Present	Past	Present	Past	Present
Total Land Cultivated	10	20	10	20	10	35
Groundnut	10	20	10	30	10	15
Millet	10	20	10	30	10	25
Sorghum	10	7	10	20	10	7
Maize	10	20	10	40	10	25
Findi	10	7	10	5	10	11
Cassava	10	20	10	5	10	15
Sweet Potato	10	20	10	15	10	14
Rice	10	7	10	0	10	11
Vegetable	10	40	10	15	10	29
Cattle Owned	10	8	10	25	10	45

Source: The Study Team, 2004

Auto-consumption of farm produce comprising of maize, millet, sorghum and rice for the six agricultural divisions of the country in 1993 is shown in Table 3.14. According to the data, the farmers in URD generally have auto-consumption implying that there is limited commercialization of the indicated crops. It has the highest proportion of dabada growing maize (93%), but the least proportion of dabada growing the other crops (20% for rice). The division also has the highest proportion of auto-consumption for sorghum with 68% against a national average of 30%, which indicates the preference of farmers in URD for coarse grains.

Table 3.14 Auto-Consumption of Farm Produce, 1993

Division	Maize	Millet	Sorghum	Rice
WD	94(75)	95(84)	100(25)	99(54)
NB	94(67)	88(93)	92(20)	74(46)
LRD	97(86)	98(87)	96(21)	100(81)
CRD North .	73(89)	76(80)	68(21)	51(68)
CRD South .	80(93)	83(89)	86(31)	79(58)
URD	**90(93)**	**91(64)**	**92(68)**	**100(20)**
The Gambia	89(82)	90(83)	91(30)	84(55)

Source: National Agricultural Sample Survey 1993 (DOP/MOA)

Note: Figures in parenthesis refer to percent of dabada (=household) growing respective crop in the Division.
Interpret as follow: 93% of dabada in Upper River Division grew maize and 90% of those dabada reported consuming all their maize produced.

Table 3.15 presents data from the Household Economic Survey (1993) on the consumption of cereals by division indicating proportion of home grown, purchased and consumed in per capita terms for Banjul and the other 5 divisions of the country for rice, millet, sorghum, maize and other cereals. The data indicates that for all the areas, the least amount of rice is consumed per capita in

URD, which is at 36 kg compared with a national average of 72 kg per capita. The Division only produces 6% of consumption requirement from own production of rice (equivalent to 2kg per capita).

The data also indicates a high consumption of coarse grains per capita in URD compared to all the other regions in The Gambia. For millet it has a consumption requirement of 30 kg per capita with 94 % of this met from own production. This is similar for maize with 92% of 39 kg per capita consumption from own production. For Sorghum, 96% of requirement of 32 Kg is met from own production. The Division also reported the highest per capita consumption of sorghum.

Table 3.15 Consumption of Cereals by Division and Proportion

(Home grown and Purchased : kgs/year/person)

	Banjul	WD	NBD	LRD	CRD	**URD**	Gambia
Rice							
Own production	0	12(17)	30(38)	34(43)	32(49)	**2(6)**	
Purchase	87(100)	67(83)	49(62)	45(57)	34(51)	**34(94)**	
Total	87	79	79	79	66	**36**	72
Millet							
Own production	0	21(84)	44(92)	28(93)	62(94)	**30(94)**	
Purchase	9(100)	4(6)	5(8)	2(7)	4(6)	**2(6)**	
Total	9	25	48	30	66	**32**	31
Maize							
Own production	0	2(67)	8(89)	11(100)	20(87)	**36(92)**	
Purchase	3(100)	1(33)	1(11)	0	3(23)	**4(8)**	
Total	3	3	9	11	23	**39**	13
Sorghum							
Own production	0	5(71)	1(100)	0	19(95)	**30(94)**	
Purchase	1(100)	2(29)	0	0	1(5)	**2(6)**	
Total	1	7	1	0	20	**32**	9
Other grain							
Own production	0	0	1(33)	0	0	**4(57)**	
Purchase	6(100)	1(100)	2(67)	1(100)	0	**3(43)**	
Total	6	1	3	1	0	**7**	3
Bread	37	1	6	8	7	**4**	14
Total cereal Eaten per capita Per year(kgs)	143	127	147	129	184	**150**	143

Source: SDA, Household Economic Survey, 1993

3.4.4 Vegetable Cultivation

In The Gambia, vegetable production has been growing, both at the large scale and at the community levels, where groups of women cultivate small independent plots in communal

gardens. The majority of these women continue to operate their plots in spite of the many constraints they encounter. The main production areas for vegetable are the Western and North Bank Divisions where climatic conditions are most favourable.

Vegetable production in URD is generally carried out by women at two different types of gardens. The first is the kafo vegetable garden which constitute the majority of the gardens with hand-dug wells (about 8 meter deep or more). The second comprising of private gardens constitute the majority of vegetables watered with hand-dug wells (less than 2 meter). The plots are of small (a plot size ranging from $5m^2$ to $10m^2$ approximately) and fragmented. Water is drawn from hand-dug wells using a bucket and rope. The time spent for watering is very long. The FAO report[6] points out that out of all working hours in a week, women invariably spend nearly half of working hours watering their gardens during the dry season.

A range of vegetables including onions, tomatoes, cabbages, egg-plants, okras, peppers and bitter tomatoes, etc. are grown in private gardens or in small individual plots within the community gardens, mainly October to April in URD. The main production areas are Touba Tafsir, Chamois, Dampha kunda and Tambasansang in the suburbs of the divisional capital Basse. A lot of gardens have faced marketing problems; even so, women continue to cultivate for home consumption and sale in the local market on a small scale. This is manifestation of the fact that gardening is a very important activity during the dry season for women as social and economic activities.

According to an IFAD Report cited below, there are about 90 gardens covering about 1.3ha each with a total production of 320tons in URD.

Table 3.16 Vegetable Production by Division

Division	No. of Gardens	App. Area (ha)	Cropped Area(ha)	Total Prod.(ton)
Lower River (LRD)	66	77	154	1,540
Upper River (URD)	89	116	232	320
Western (WD)	94	270	675	10,120
Central River (CRD)	106	136	272	720
North Bank (NB)	59	155	385	4,620
Total	314	754	1,718	21,320

Source: RFCIP report, IFAD, 1997

NASS data reports on vegetable cultivation and marketing showing the number of vegetable farmers in percentage. This is highlighted in Appendix 3.3, which is collected from responses of sample farmers for onion, okra, eggplant, tomato and pepper (chili). Although the data shows a high percentage of vegetable farmers in Western division and North Bank division, the sale of vegetable is problematic in URD, as there are only a few marketing outlets.

[6] The peri-urban horticulture and livestock development project, preparation report, 1998,FAO

3.4.5 Cropping Calendar

All the major crops except irrigated rice are in line with the farming calendar which follows that of the rainy season. Crops are sown in early July after the land preparation carried out in middle of June. In the event of occurrence of drought in the early part of the rainy season in July, farmers re-seed early millet or early groundnut varieties by the end of July. (refer to Appendix 3.5)

In the case of swamp rice, which requires much more time for land preparation, broadcasting starts in the middle of July whilst transplanting starts in early August. Sesame and Melon are usually planted late, with sowing done in August.

3.4.6 Cropping Technology

Most farmers use the animal drawn seeder, mostly imported from Senegal, for the sowing of groundnut, maize, sorghum and millet. The weeder, also imported from Senegal is used by most of the farmers. However, it doesn't always work well, resulting in lots of weeding particularly by women in groundnut fields in July. Fertilizer application is not common due to a low response especially in owned consumed crops such as sorghum and millet. Recommended seed rates in major crops are shown in Appendix 3.6.

Although crop rotation is practiced, groundnut is commonly planted every two years in the same land without fallow. Elder farmers say that they could harvest double the yield of groundnut 20 years ago. One reason may be decreased rainfall in the recent years. Another reason may be the lower quality of seeds and the poor soil fertility due to long years of cultivation.

3.4.7 Indigenous Technology

In some vegetable gardens, various sorts of plants are planted together comprising of vegetables, flowers and spicy herbs. It is a coping strategy adopted by farmers to prevent the risk of failure due to climate. Some produce survive, while others die under the severe climatic conditions. Given the wide variety of plants, pest management may also be easier.

A number of interesting traditional ideas on useful trees and grasses are obtainable from villagers. For example, the leaves of the Neem tree are believed to cure malaria. Another tree, moringa is called "Miracle tree" as it can cure lots of diseases. A US NGO recently published a book on Moringa, and some women groups have plans for afforestation with Moringa in URD.

There is also a grass locally called "Susula-nyamo" (Mosquito grass) which deters mosquitoes. This grass is a vigorous annual plant with a height of about one meter and easily produces seeds. Some farmers use this grass for preventing mosquitoes bites in the house-yard around.

3.5 Livestock

3.5.1 Livestock Grazing in URD

Grazing animals shall be divided into cattle and small ruminants (sheep and goats). Cattle grazing is further divided into two: long distance and one-day distance. One-day distance grazing refers to starting grazing in the morning and returning back to the settlements in the evening. Long-distance grazing is carried out when crop residues and grass in the communal lands are depleted. In northern areas of The Gambia River in URD, cattle herders move over 60% of cattle toward CRD where grass and water are sufficient for them until the beginning of rainy season. It takes 4 to 5days to reach the destination for grazing, but not more than a week. The remaining 40% stay in URD and, at the end of the dry season, the owners have to provide some minimum fodders such as groundnut hay at expensive prices in order to avoid death of cattle from lacks of feed.

During the rainy season, cattle herders roam communal grazing lands with cattle flocks in search of fodder and water paying careful attention not to enter fields cultivated to crops. The owners of small ruminants also keep them in enclosures and houses and prevent them from entering the cultivated areas. After the harvesting period, cattle and small ruminants can enter most places and roam freely to feed. This traditional free grazing provides animal manure which comprises of valuable organic fertilizer for farming.

In southern parts of Gambia River in URD, herders repeatedly practice one-day distance grazing towards the Senegal border, and often cross the border, because grasses and water for cattle are sufficiently available in those areas.

Since Mandinka and Serahuli tribe mainly are farming tribes, they don’t usually keep their cattle flocks around settlement areas. They employ the Fula to raise and graze their cattle for 7 months from July to the middle of dry season in January. The owners basically offer housing, clothing and food for herder(s) and pay about 3,000 Dalasi per period and the right to milk once a week (on Friday). This system is common not only in The Gambia but also in other West African countries. After January, cattle roam here and there according to fodder and water supply.

Communal grazing lands belong to communities such as village groups, families in villages, individual groups, settlement groups or ethnic groups and many members overlap. The access to the communal grazing lands is free if they belong to the communities. And the access to crop-harvested lands is generally free.

3.6 Marketing

3.6.1 Produce Marketing

Groundnut, maize, cotton and sesame are known as “cash crop”, as more than half of the amount harvested are sold. The sale of groundnut is carried out not only through the Crop Produce

Marketing Societies (CPMS) also known as “Secco”, but also through the middlemen who sometimes come directly from Senegal or through the local weekly markets. There are eight (8) weekly markets in URD.

There are two main channels of the marketing for agricultural produce; shipment to markets (outside the local area) and marketing within the local area. If produce is shipped outside the local area, it may be sold directly to middlemen, who come to buy it, or the farmers may himself/herself take the produce to those markets. Marketing within the local area consists mainly of sale at the weekly markets, which take place in centrally located villages.

Middlemen purchase produce at the fields in October and November, immediately after harvest, when the sale prices are the lowest. This is a time when farmers need to incur large expenses including the payment of school fees, and may often sell produce even at low prices. In some cases, farmers may even sell the seed that they should keep for planting in the next season. However, when it is time to plant crops, the same middlemen may come to sell seeds at very high prices. The period from June to July, when stored grain supply runs low, is known as the “hungry season”. Farmers may be obliged to sell small livestock and other assets during this period to provide food for the household.

3.6.2 Trade between Senegal and URD (Interviews with Banabana)

Interviews with “banabana” (Senegalese traders) on the flow of goods, particularly agricultural produce, between neighboring Senegal and URD, produced the findings summarized below.

- ✓ Most daily necessities, utensils and agricultural tools used to come from Senegal. However, the 1994 devaluation of the Senegalese currency (CFA) made Senegalese prices relatively more expensive, and hence Banjul became the source for such goods.
- ✓ Prices of agricultural produce (particularly grains) in The Gambia are highest in June and July. The early harvest of maize begins at the start of August, and then the prices start to decline.
- ✓ Price differences between Senegal and The Gambia are as described below. However, these are prices the banabana pay for goods which they buy around Banjul (The Gambia) and around Bakel (Senegal).
- ✓ They buy and sell around Bakel, because the people of the area prefer to eat millet and maize, rather than rice.
- ✓ They enter Senegal from Basse via Fatoto. The transport cost from Basse to the border is 25D/50kg, and that from the border to Bakel is 1,000cfa/50kg.
- ✓ Goods are sold in The Gambia at the market at Basse and at weekly markets in Sabi, Kossemar Tenda and elsewhere.
- ✓ When we asked about evacuation of vegetables from The Gambia to Tambacounda and

elsewhere in Senegal, we were informed that it was difficult, because Senegal can supply vegetables all year round, and can produce various types of vegetables in large volumes.

✓ There might be potential for products rarely seen in Senegal, such as dried Mangos.

Table 3.17 Trade between The Gambia and Senegal

Produce and route	Senegal (Retail price)	The Gambia (Retail price)
Black-eyed beans (Sen. →Gam)	500cfa/kg=25D/kg	30D/kg=600cfa
Groundnuts (Gam. →Sen.)	600cfa/kg=30D/kg	21D/kg=420cfa/kg
Sorghum (Gam. →Sen.)	15,000cfa/50kg=750D/50kg	430D/50kg=8600cfa/50kg
Maize (Gam. →Sen.)	15,800cfa/50kg=790D/50kg	430D/50kg=8600cfa/50kg
Millet (Gam. →Sen.)	Same as maize	Same as maize

(In the period of low post-harvest prices as of 2002). 1D=20cfa
Note; Banabana: Senegalese traders are mainly operating on a small scale.

3.6.3 Weekly markets (Lumos)

URD has both regular markets and weekly markets. Farmers buy their daily necessities at the markets and sell their surplus produce, and women may retail other goods. Thus, the markets have very important roles in the rural economy. Although there are eight (8) weekly markets in URD, the north bank of URD has only one. Weekly markets are coordinated by Management Committees with members drawn from both the host and neighboring villages. Participants pay a market tax to the Area Council and a user fee to the management committee. Some key characteristics of lumos are as follows;

1. Transportation across the borders is mainly by horse and donkey carts, bicycles and headload.
2. Lumos are always held in alternate days to allow more competition
3. Most of the Lumos are located on border villages to enable people from both countries to converge.
4. Lumos thrive on the fact that less restriction is applied on cross border trade, thus allowing a lot of people to attend lumos.
5. Lumos provide the opportunity for different kind of goods to be displayed and give consumers a choice.

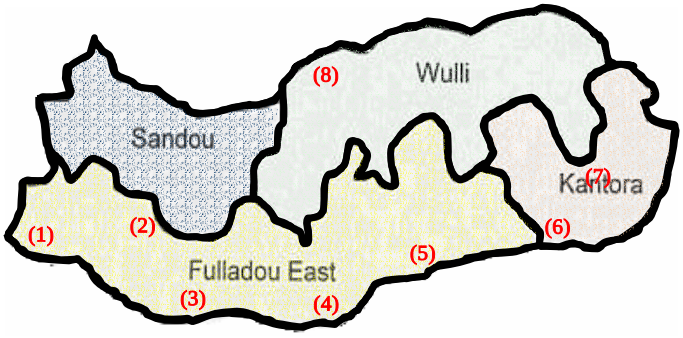


Figure 3.4 Location of Lumos

Table 3.18 Lumos in URD

No.	Lumo	Location (Ward)	Open Day	Main Items
(1)	Sare Bojo	Julangel	Tuesday	Vegetable, Cooking oil, Rice, Sugar, Groundnuts, Maize, Millets, Banana, Cassava Grenn Tea, Sheep, Goat, Cattle, Poultry, Farm implements, Carts Bicycles, Clothing, Foot ware,
(2)	Kossemar		Saturday	
(3)	Gambisara		Wednesday	
(4)	Sabi	Sabi	Sunday	
(5)	Dingiri	Dampha Kunda	Thursday	
(6)	Gambisara Lamoi	Koina	Saturday	
(7)	Fatoto		Sunday	
(8)	Sare Ngai	Sare Ngai	Monday	

The Figure 3.4 shows the location of each lumo. As it can be seen, the lumos are located close to the border with Senegal, except for (2) Kossemar Tenda and (7) Fatoto. Appendix 3.6 shows Characteristics of Lumo.

3.6.4 Basse Regular Market

Basse is the second Capital of The Gambia and its market serves as a major market for the most remote regions in the country. The Basse market is the largest in the division and the only one within a ten (10) km radius. It is also the main regular market where products ranging from agricultural produces such as vegetables, cereals and groundnuts to imported goods are on sale daily. It is dominated by middle men who operate in two categories:

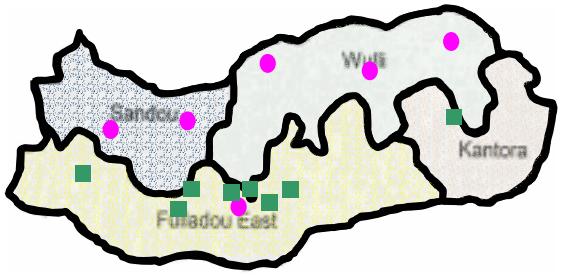
- Those operating in the agricultural sector, go to buy agricultural products paying farm gate prices either at the weekly market (Lumo) or at farmer's own home. These products are brought to Basse Market and resold at retail prices to consumers, and,
- The second category deals with imported items and purchases these items from Banjul using Basse market as the major distribution outlet to the rest of URD.

3.6.5 Marketing Channel of Each Crop

Regarding Groundnuts in the 2004/2005 crop year, there are 6 seccos' buying points in URD and 8 private but registered vendors' buying points. From the buying points, produce is transferred to the depots located in each bank of the river, accordingly to Banjul. The prices the private venders offer per kg are different being higher at early part of harvest season, and getting lower as time goes and produce brought increases.

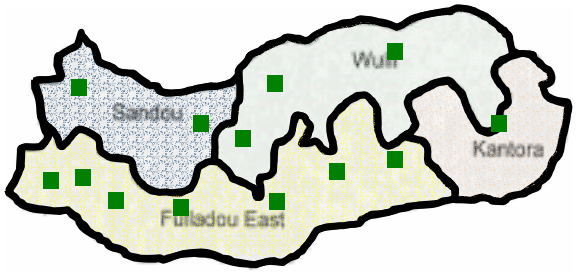
For the other cash crops, almost all sesame in URD is marketed through Sesame Growers' Associations (SGAs). There are 72 SGAs throughout the countries with support of CRS and they formed themselves into a National Women Farmers Association (NAWFA). Among the 72 SGAs, thirteen are in URD. Eight SGAs are in the south bank, and five in the north. Farmers bring their sesame to SGA buying points, where the produce are sent to SGA collection centres and

subsequently, exported. Regarding maize, there is NAYAF, a national organization which works with 81 affiliated groups in URD. These groups are farmer organizations working to improve food security. GAMCOT is the only company involved in cotton marketing in The Gambia. The crop is mainly grown in the Upper River and some parts of the Central River divisions and the ginnery is located at Basse. A cotton production review study was funded recently by EC with the aim to improve production. Farmers were organized into an apex body called COGA. There are 8 Area Circles out of the 12 Areas set up to coordinate both production and marketing. The figures 3.5 and 3.6 show the location of marketing channel of groundnuts and sesame in URD in 2003/2004.



● : Secco, ■: Private venders (2003/2004)

Figure 3.5 Location of Groundnut marketing channel



■: Sesame Growers Association (2003/2004)

Figure3.6 Location of Sesame marketing channel

3.7 Agricultural Support Services

3.7.1 Agricultural Support Organizations

There are two main types of agricultural support service institutions, which include the public sector governmental organizations and the NGO supported activities.

1) Governmental Organizations

A number of governmental organizations operate in the division, providing a range of services to farmers and CBO's. The most relevant of these include the agricultural services, livestock services, planning, forestry and community development. Other service providers include the Social Development Fund (SDF) which provides grants and credit to rural dwellers. The above exist at the divisional level in Basse and also form a part of the Institutional Sub-Committee.

At the level of the ward, the Multi-Disciplinary Facilitation Team (MDFT) functions, providing a range of services to communities. The MDFT consists of district and village level extension staff of agricultural services, livestock, community development, forestry and health.

2) International Organization and NGO activities

A number of NGOs and projects supported by international donor organizations are operating in the division. Key projects include the UNDP funded Fight Against Social and Economic Exclusion (FASE); the FAO initiated Special Program for Food Security (SPFS) which utilizes "South-south Cooperation" using Bangladeshi experts and technicians; and the African Development Bank (ADB) funded Social Development Fund (SDF) and Community Skills Improvement Project (CSIP). Most of these project activities are geared towards women. Active NGOs include both international and local ones. The international NGOs comprise Action Aid The Gambia (AATG) and Voluntary Service Overseas (VSO), whilst the local NGOs comprise of Association of Farmers, Educators and Traders (AFET), National Women Farmers' Association (NAWFA), Gambia Women Finance Association (GAWFA) and Women in Service Development and Management (WISDOM) and ADWAC (Agency for Development in Women and Children).

Three main Community Based Organizations (CBOs) are also active in the division and include Wuli and Sandu Development Association (WASDA), Wuli Association for Development (WAD) and Rural Support Organization for Disable (RSOD).

3.7.2 Research Institutes

The National Agricultural Research Institute (NARI) has its head-quarters in Brikama. It has two stations at Brikama and Sapu with the former covering the western-part (WD, NB and LRD) and the latter covering the eastern-part (CRD and URD), respectively.

Overall leadership is provided by the Director General with the Director of Research coordinating the 13 research program of the institute in the two stations as follows: (1) cereal research program; (2) grain legumes; (3) pest management program; (4) socio-economics program; (5) cropping system program; (6) Horticulture research program; (7) Engineering program; (8) Livestock research program; (9) Seeds technology program; (10) Agro-forestry research program; (11) Fishery research program; (12) Farm management program; and (13) Documentation program. In addition to the research programs, NARI has sections for Finance & administration and a reference library.

NARI has its branch office in URD at the Giroba Kunda MFC. Although it is not very active now, there are plans to reactivate it in the near future.

3.7.3 Farmers Organization

Farmers engaged in groundnut, cotton and maize production have established crop grower's organizations. These comprise of the Crop Produce Marketing Societies (CPMS) for groundnuts, Maize Growers Association (MGA) and Cotton Growers Association (COGA). COGA held a

meeting on July 23 2005 at the DAO. URD has over 500 cotton farmers with 150 ha under cultivation for marketing with GAMCOT co.. The extent of cotton production could decrease due to shortage of fertilizer in 2003. The MGA was organized by the extension service in 2001, with 118 farmers in 30 villages cultivating 116 ha.

Every village has a Village Development Committee (VDC). Besides the VDC, there are various sorts of Women Associations (groups). Most of them have been registered as charitable companies or national network of Women Association such as YAMPI, GAYFA (The Gambian YAMPI Farmers' Association). Some women associations have registered with Cooperatives (DOCD).

3.7.4 Micro Finance

The registered Microfinance Institutions in URD are, GAWFA, VISACAs, GAMSEM and WASDA. The Social Development Fund (SDF) provides the bulk of the fund to these institutions and all institutions provide agricultural loans to farmers in URD. Other fund providers include Rural Finance project and the Central Bank of The Gambia.

1. GAWFA- Gambia Women Finance Association is a registered microfinance institution providing loan to individuals, solidarity groups and large groups. The basic conditions to qualify for all loan are:
    - Must operate a Saving Account with GAWFA for at least 3 months;
    - Be a member of a group;
    - Individual loan must not exceed 2.5 times of Savings and a collateral is required;
    - Savings of individual members serve as guarantee for Solidarity Groups and loan don't exceed 5 times of savings;
    - Large group's Savings serves as guarantee and is 6 times of group saving.

    The repayment rate for agricultural loan largely depends on the success of the season and is given for a 12 months period.
2. VISACA- Village Saving and Credit Association have 8 centres in URD. The VISACAs were created to institutionalize the old system of revolving fund at village level. These are Central Bank registered and the Rural Finance Project provides financial support to these groups. They operate through village committees which compile all applications and conduct initial assessment on applicants and recommends either for approval or otherwise. Borrowers also must pledge a guarantee either by farmer implements or by other valuable items. One of the VISACA Banks visited reported an 80% repayment rate on all loans.
3. GAMSEM
4. WASDA- is a CBO located in Wuli district. WASDA operates a fund given by VSO as a

grant but used this fund to raise income through the purchase of inputs.

It is important to note that the interest rate levied on loans is rated very high between 35% and 36%. The reason is the rate of inflation experienced recently. Interest rate on this fund was pegged at 14%, but it is now around 29 to 30%. The microfinance institutions lending money also adds some per cent on Central Banks interest. This constraint resulted in almost defeating the purpose of lending to increase income and reduce poverty as borrowers cannot make any profit.

3.8 Rural Infrastructure

A number of infrastructural development activities are ongoing in the division with the support of projects and NGOs. These activities are being supported by several funds which promote demand-driven projects particularly in the water resources, health and education sectors. The Social Development Fund sponsored by AfDB for example is providing multi-sectoral funding for rural development throughout the country. It is very active in URD, and has a policy of requiring villagers' to contribute to activities and facilities such as well digging, hospitals and school buildings. Other collaborators facilitating the provision of infrastructure include SDRD, FASE as well as NGOs**.** Appendix 3.8 shows Location of Milling Machines in URD.

1) Communication

Upper River Division is accessible by bituminised trunk road from Banjul up to Basse and has various networks of secondary laterite roads connecting various parts of the division. Some of the roads are in good condition whilst others need repair. The Gambia Public Transport Company operates a bus service along the major road and along the main feeder roads. Other means of transports include mini vans, taxis, horses and donkey carts. Motorbikes are also widely used as means of transport in the division. There are two commercial banks (Trust Bank Ltd and Standard Chartered Bank) located in Basse, which is the administrative capital of the Division. Also, most of the major towns and villages have Telephone facilities at Telecentres. Appendix 3.9 shows Road Infrastructure in URD

2) Health services

In the Upper River Division, health services are administered by a Divisional Health Team (DHT), which is based in Basse. A Divisional Medical Officer (DMO) supervises the DHT. There is no referral hospital in the division, and the nearest one is 65km from Basse at the Central River Division (CRD). Two major public health facilities exist in the division and are located in two districts. Complicated and more serious cases are referred to Bansang or Royal Victoria Teaching

Hospital in Banjul depending on the nature of the illness and availability of facilities and services. Appendix 3.10 shows Medical Research Centre (MRC) in URD

3) Education

According to the education office in URD, as of 2005, 62 Lower Basic Schools existed in URD, with a total enrolment of 17,501 pupils comprising of 9,678 female. There are 6 Upper Basic Schools with a total enrolment of 2,207 pupils, out of which 962 are female. One Senior Secondary Schools i.e Nasir Senior Secondary School located in Basse has a total enrollment of 333 pupils of which 63 are female (1998). Only one skills centre exists with an enrolment of 1,447 pupils of which 710 are female (1998). Appendix 3.11 shows Schools in URD

Chapter 4 Development Constraints and Potentials

4.1 Analytical Method

The main aim of this Study is to determine ways of improving livelihoods of rural people through sustainable agricultural interventions. As described in Chapter 3, agriculture, particularly crop production, is a vital part of the livelihoods of people living in the study area. In this study the current situation was reviewed with particular references to livelihoods, development challenges identified and development programs assessed at a preliminary level, in order to determine development potential in line with the study objectives, and the factors impeding that development. The study followed the methodology as mentioned below:

(1) Review of existing literature;
(2) Community-based project review and interviews;
(3) Review of Community Action Plans (CAP) drawn up by each village, and assessment of progress;
(4) Interviews on the status of Village Development Committee activities;
(5) Investigation of the activities of farmers' groups and access to development;
(6) RRA study conducted jointly with local NGO;
(7) A PCM workshop for URD agricultural extension staff; and,
(8) SWOT analysis, focused on agricultural activities of Village Development Committee members and the representatives of farmers' groups.

4.2 Preliminary Examination of Development Issues

After the above mentioned study and analysis, a preliminary examination was carried out on the positive and negative effects of the situation regarding rural livelihoods and the local resources from a "Five Capitals" perspective, and observations and findings are presented in Figure 4.1.

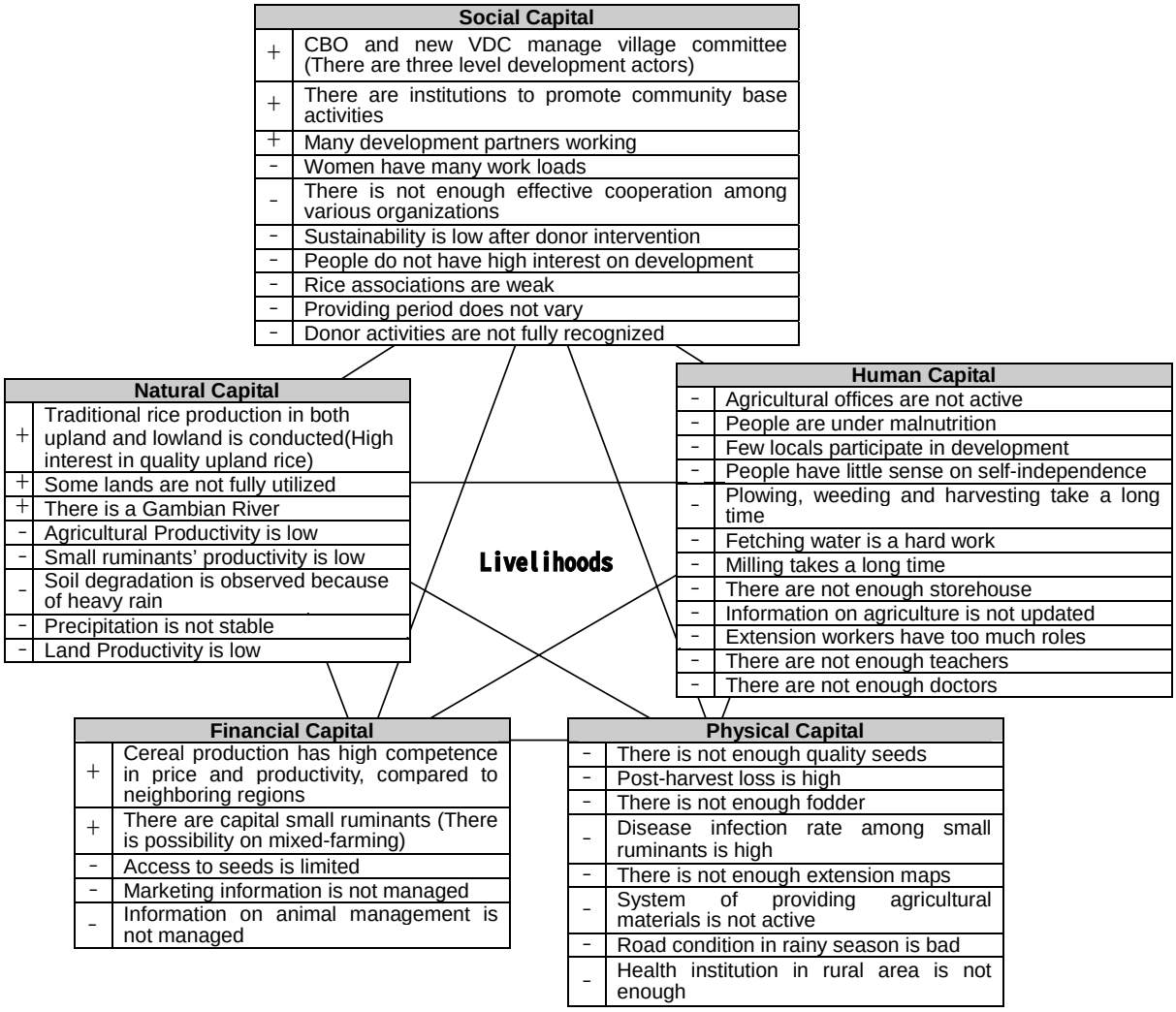


Figure 4.1 Analysis of URD with Five Capitals

4.3 Development Constraints

Following the above-mentioned examination and within the framework of the study, development constraints in the study area were analyzed and identified, as summarized below.

4.3.1 Low Soil Fertility and Agricultural Productivity

The soil fertility of upland fields in the Gambia is remarkably low, risking declining agricultural productivity. Most of the loss of fertility is due to increasing population pressure of both people and livestock. Population growth increases demand for food, shortening the fallow periods allowed for farmland. The Upper River Division (URD) has one of the highest population growth rates in the country (3.4% in 1983-1993). Demand for firewood is also increasing, and the growing number of livestock adds to soil erosion. These trends lead to further soil depletion.

The topography of URD consists of gentle slopes, which make it easy for strong rains to wash topsoil away. The topsoil of farmland in dry-field areas, which is relatively rich in nutrients, is washed away, accelerating the decline in soil fertility. Soil loss from farmland is strongly impacted by crop cultivation by farmers, and can be reduced by techniques such as contour planting.

Productivity of agriculture is influenced by various factors as indicated below.

1) Irregular rainfall

In the 2002 farming season, there was almost no rain in the early growth period, and crop production was hit hard. In general, poor harvests often result from periods without rain in the reproductive stage of grain crops. Annual rainfall in The Gambia is reported to have declined by approximately 30~40% in the last quarter of the century. On the other hand, some farmland in swamp areas of URD have been abandoned due to floodwater influxes.

2) Limited Access to Farm Inputs and Implements

In crop production, the limited access to seeds, fertilizers, farm implements, draught animal, and improved varieties is of paramount concern to the farming communities.

3) Lack of information for improved cultural practices

Given the relative short rainy season coupled with the scarcity of farm labour, the adoption of recommended cultural practices for increased agricultural production on a timely manner is crucial.

4) Unsuited Land Tenure System

The land tenure systems in The Gambia differ clearly between the Greater Banjul Area and the rural areas. The former has a free ownership system, while much of the land in rural areas is communal means. In rural areas, land allocation is determined by traditional village systems, and free sale or renting of land is difficult. Practical farmers aiming to expand the size of their farms run into that obstacle. The land allocation process is known to discriminate against women, who are given unproductive land. Interviews with old women in the villages revealed that they used to be allocated good land, but with the increase in population and the arrival of new settlers, they are often given poor land now.

4.3.2 Difficulties of Access to Markets

The presence of attractive markets is an important incentive for agricultural production.

Distribution of produce in URD would consist of distribution within and outside the region. The former is largely controlled by the purchasing power of the local people, their population and their dietary customs. It consists of eight markets, both permanent and weekly, in URD. The weekly markets are important centers for economic exchange in rural areas, but most market sites lack storage facilities. There are many constraints, such as the distance from farms to market, the road conditions and the need to carry produce on vehicles. The sale of groundnuts and grains, which are the main cash crops, put the farmers at a disadvantage, because of lack of pricing information.

4.3.3 Heavy Work Load on Women

Women in The Gambia have multiple roles and responsibilities, which heavily task their time and energy, resulting in long and arduous workdays. Almost all women are engaged in agriculture and most of the tasks continue to be carried out with traditional manual farm tools, placing a high premium on women's time. This situation exists simply because input delivery systems are generally designed through heads of households for the improvement of male production activities. Women increasingly shoulder the burden of providing food and clothing for themselves and to some extent for their children too, even though it is man's responsibility to ensure that his spouse and children and other dependents are fed and clothed. Strongly embedded cultural traditions mean that women have lower social status and control fewer assets than men.

4.3.4 Inefficient Provision of Agricultural Support Services

The typical extension organization in the Gambia is one of overlapping extension responsibilities between several public agencies and Non Government Organizations. The key public agencies involved in extension for agriculture and rural development are under the Departments of State responsible for Agriculture, Natural Resources, and Local Government. In addition, some autonomous externally funded projects are involved. Crop and livestock extension services are the responsibilities of the Department of State for Agriculture (DOSA). Natural resources extension services including forestry, parks and wildlife, and fisheries are the responsibilities of the technical departments of the line Department of State responsible for Fisheries and Natural Resources (currently under the Office of the President). Rural and Social development extension services is the responsibility of technical Department of Community Development (DCD) of the line Department of Local Government and Land. Local and foreign NGOs perform a variety of agriculture, natural resources and rural social development extension services.

The public extension services for agriculture and natural resources are conducted by the line

departments of Agricultural Services (DAS), Livestock Services (DLS), Forestry, Fisheries and Parks and Wildlife Management (DPWM). Although the DAS has the major responsibility for agriculture and natural resources extension, each of the line departments has a fully-fledged or fledgling structure unit dedicated to extension services. They all address the same clientele with their messages, but with little or no coordination at the level of the intended recipients.

The agricultural extension service is characterized by the chronic inability of its workers to get out into the countryside in order to provide services to client populations. Many of the various extension entities lack money for vehicles, fuel, telephone communication or other materials, thereby severely limiting their ability to fulfill their mandated roles.

4.3.5 Unsustainability of Investments after the withdrawal of Donor Assistance

Many countries face serious problems with the operation and maintenance of facilities after donor assistance for agricultural development ends. Problems include the burden of maintenance management, and the difficulty of obtaining spare parts and carrying on operational management. Learning from these experiences, the plan preparation process in URD took a bottom-up process from the beginning, with the implementation of numerous micro-projects. Considering these cases, the projects which receive ongoing technical support appear to be relatively successful. In any case, farmers of URD have little ability to pay, and their knowledge of project operation and maintenance management appears to be at a low level. For the sake of sustainability, the plan should be based on the ability of local people to bear the burdens of projects, with urgent provision of training for their project operation and management abilities.

4.3.6 Lack of Technical Capabilities

Inadequate technical and institutional capacities at different levels have been the major constraints in addressing the above concerns. This is so because the Government has traditionally been the lead player in the planning and implementation of development projects. The communities had very little involvement, if any, in undertaking such functions. There is now an increasing awareness and appreciation about the role of local communities in ensuring the sustainability of development projects. In this regard, there is a strong need to develop and implement capacity building programs to strengthen capacities of NGOs, CBOs and VDCc in agricultural information, project management, improved cultural practices, food processing and marketing.

4.3.7 Lack of Entrepreneurial skills

Every farmer in the rural area is a member of a market based economic environment. To

improve his/her livelihood, entrepreneurial skills are required. It is very clear that farm management is one of such economic activities. It relates to searching for progressive or innovative farmers and their aptitude and strengthening individuals or group of individuals (Kafos, VDCs and CBOs) as leading body or group leaders.

4.4 Development Potential

As described above, many factors hinder improvement of rural life, as in many other villages in developing countries, are observed in URD. However, positive institutions/services and support to which people can access are also available extensively from sector to sector, which can be regarded as potential for development in URD.

4.4.1 VDC, WDC and DCC

VDCs are the focal points for rural development and capacity building in the rural communities. Their formation and strengthening are as a result of the recognition that development interventions in the villages were being duplicated with the resultant loss of resources, disorganization of traditional group recognition and leadership, as each agency tended to form its own group for community development interventions. By forming one entry point it allows for rationalization of the all development interventions within the communities.

Table 4.1 Composition and responsibilities of development committees

	Consists of	Responsible for
VDC (Village Development Committee)	-Chairperson elected -One male and one female representing each kabilo -One male and one female representing each kafo -A representative of youth kafos and others	To identify local development needs To prioritise such development needs To develop appropriate plans for addressing local needs To raise, co-ordinate and manage financial resources To mobilise community participation in development To implement and manage such development plans To support and strengthen all development oriented groups
WDC (Ward Development Committee)	-Councilor -One male and one female representative from each VDC -Representatives of organisation involved and others	To carry out the same above at Ward level In addition; To review village plan To prioritise solutions and alternatives to problems To serve as entry point for all outside assistance To coordinate development activities at Ward level To collaborate with donors in preparing project proposals To promote Ward interests to the Council and the donors
DCC (Divisional Coordinating	-Commissioner -Regional heads of government departments	To provide technical advice to the Council and the above two development organizations

	Consists of	Responsible for
Committee)	at local level -Representative of NGOs and others	(This is now to be called Technical Advisory Committee under the revised Act 2002.)

Source: Developed by the team referring to Local Government Act 2002

There are other committees at Ward and Division level, all of which aim at rationalization of development activities. As seen in the above table, the Local Government Act 2002 indicated clearly what each committee is supposed to perform. This structure has been developed and functioning gradually.

4.4.2 MDFT and DCD

The MDFTs are a multi-disciplinary team of extension workers whose role is to contribute to a holistic approach of community development. The teams are made up of a core team of extension workers from Health, Agriculture, and Community Development. This core team is beefed up by other extension workers from other line departments, or NGOs that are posted within a given ward. The MDFTs are the interface between the different levels of the decision making process.

The MDFTs also provide a window of opportunity for sensitisation and capacity-building of the VDCs and WDCs with the resultant effect in the long run to empower rural communities to initiate, plan, implement and monitor and evaluate local development interventions. Since the advent of the concept and operations of the MDFTs, a very gradual and positive approach to community-based planning and development is gaining ground in the divisions of URD, NBD and WD.

The DCD provides advisory and supportive roles to all development aspects at the National Level. DCD takes the lead role in facilitating the work of the MDFTs. At divisional level, the DCD has a Community Development Officer who is the head of the Facilitation Unit and is responsible for all community level capacity building and development work.

The DCD provides the office space and administration personnel to support the Facilitation Units. The CDO works in tandem with the Community Development Facilitator and the Social Development Advisor to implement the participatory planning and development process in the division. The DCD has tremendous potential for development, as it is one of the key departmental stakeholders and the nationally recognized institutions to advise and support all development interventions in the Gambia. It has all the necessary structures nationwide to facilitate the execution of its mandate, and takes the lead in the work of the MDFTs.

4.4.3 Development Partners Activities for Institution Building

There are many development organizations who have worked and are actually working at the moment. As far as institution building is concerned, the following four organisations are the distinctive and influential ones currently operating in URD.

(1) The Support to Decentralized Rural Development (SDRD)

The SDRD was a part of Government's development programme aimed at sustainable economic growth and poverty reduction. The programme focused on rural development and supports national strategies laid down in Government's PRSP (2002) and in its Vision 2020 (1996). The SDRD is designed to support sustainable rural development in the three divisions of the Gambia – NBD, URD and WD. It seeks to consolidate achievements of previous EC programmes, such as URDIP and the DDP (Divisional Development Programme), taking into full account the recommendations of the end of programme evaluation.

The SDRD is providing support to URD Area Councils by facilitating the decentralisation strategy and the development of a divisional plan through aggregation of CAPs from villages.

The expected results from the SDRD are:

- Increased rural incomes;
- Improved access to and performance of rural social services;
- Trained communities participating in and managing sustainable local development ;
- Operational divisional institutions supporting local development; and,
- Operational national institutions coordinating and monitoring programme activities.

(2) Social Development Fund (SDF)

The SDF was institutionalized in 1998 by the GOTG as an autonomous charitable umbrella-funding agency for poverty alleviation activities in the Gambia. It works with MFIs (Micro Finance Institutions), NGOs, CBOs, and PSIs (Public Sector Institutions). The SDF uses a participatory demand-driven approach as its main intervention strategy in channeling resources to the poor in the most effective, efficient and timely manner. It utilizes a three-pronged approach to attack poverty: extensive outreach, monitoring and access to social and economic ventures. Its main target beneficiaries are women, youths and the handicapped. In URD, the SDF provides loans to NGOs (GAWFA, NACCUG, AFET, GAMSEM etc.) for onward lending to their member CBOs or Kafos.

These loans have been utilized for various projects. Some of the loans are redistributed to

individual or group members to facilitate their engagement in individual small scale or group enterprises, such as soap making, tie and dye/batik, petty trading, sheep fattening, etc.

(3) Fight Against Social and Economic Exclusion (FASE)

FASE is a UNDP credit supported programme that aims to strengthen the skills and entrepreneurial capacities of groups that have already benefited from the previous ESL/House Food Security components of SPA1. It provides capacity-building support to groups in various small scale enterprise activities, and assists with small amounts of funds to facilitate their start up operations. It is presently engaged in URD, CRD North and South and WD. FASE works in close collaboration with other CBOs and NGOs in the division engaged in similar activities of capacity building.

(4) Voluntary Service Overseas (VSO)

The VSO is a British Charitable organisation, whose mission is to share skills through capacity building, and the promotion of international understanding and action, the pursuit of an equitable world. Its main areas of interventions are in CBO capacity building and support to agricultural activities, small scale enterprise development, health and juvenile justice, through support to the juvenile justice system. In URD, the main interventions are in support of three CBOs, namely, Fangdema Kafo, WASDA (Wuli and Sandu Development Association) and WAD (Wuli Development Association), which have affiliated village kafos. The activities carried out by these communities include rice cultivation, soap making, tie and dye, rehabilitation of vegetable gardens, weaving, tailoring and the introduction of farm implements for women.

4.4.4 Micro Finance

Micro finance credit is gradually becoming the vehicle through which local communities build up assets. There are various forms of rural finance available to communities through micro credit from MFIs and depending on their classification.

VISACAs are village owned and managed savings and credit schemes with bylaws set by the members themselves. They build up capital from membership fees and savings. They also access finances from other MFIs for onward lending to their members. NACCUG is the National Association of credit unions, and also provides credit facilities to members. Loans are both in cash and farm inputs (seeds, fertilizers etc.). GAWFA is the Women's finance company that provides loans to affiliated members and targets mostly women. It also provides loans to member NGOs for onward lending to their members. The SDF provides loans for the financing

of social projects to alleviate poverty. Loans are provided to groups for distribution to members at an agreed interest rate.

Until its recently, AATG was involved in rural finance by providing grants to village groups as a loan to be repaid into a revolving village fund (which is banked) as a means to build up capital to be accessed by all members of the community.

4.4.5 Lowland Agricultural Development Programme（LADEP）

The LADEP is a nation wide rice development programme based on the use of appropriate simple technology already proven in the field. The project came into effect in 1997 with the corporation of IFAD and ADB. This program will end in July 2004. It is based on interventions responding to beneficiary demand, and where the beneficiaries contribute their labour to infrastructure construction. Appendix 4.1 shows LADEP intervention sites in URD.

Dike construction is also planned at 7 villages this year under the LADEP scheme in URD. As the Impact assessment report of LADEP indicates, so far the programme seems to show enough increase in yield of swamp rice. As far as such infrastructures are present in some villages, follow up and re-boosting of groups involved in the project has to be led by DAS. Since the SMS Soil and Conservation in URD has been fully committed to the project, his expertise can be shared with as many stakeholders as possible.

4.4.6 Small-Scale Irrigation

Small-scale irrigation has been practiced in URD and is an integral part of the farming system particularly in dry season using underground water. This is despite the endowment with substantial quantities of fresh river water. The sustainable exploitation of these resources (underground and surface water) for small scale farming has been limited with a number of constraints including high cost of water extraction, low management capacity and inappropriate technology amongst others being evident.

(1) Past Experience

Experiences in small-scale irrigation exist for both surface water, predominantly for rice and underground for horticultural production comprising mainly of women communal vegetable gardens.

From the late 1970’s to the mid 1980’s small-scale rice production was practiced in numerous schemes funded by various donors (World Bank and Main land China) through the pumping of water from the river and conveying it through canals to the fields. Records from the University of Michigan Study on The Gambia River Basin in 1985 and extracted below indicate that some

99 perimeters covering 839.24 ha were reclaimed with 713.60 ha put to irrigated rice in 1980 with 3919 farmers involved. The dry season activities were by far the most predominant with .17 ha cultivated per farmer compared with .14 in the wet season.

Table 4.2 Irrigated rice perimeters in URD in 1980

Circle	No. of Perimeters	Area Reclaimed (ha)
Baja Kunda	10	93.30
Kossemarr	20	155.63
Basse	32	322.85
Kulari	14	79.23
Diabugu	12	90.52
Kerewan	11	97.71
TOTAL	99	839.42

Source: The University of Michigan, Gambia River Basin Studies (A study of Irrigated perimeters in The Gambia, by Lamin O. Jobe, Working Paper No.64)

By 1986 however, most of the schemes were out of operation. Although good yield were initially realized, this was not sustainable due to inefficient distribution and control of water within the perimeters, the poor infrastructure for water conveyance, low credit recoveries, poor management, the high cost of fuel and spare parts and the inappropriate pump technology.

In the case of horticulture, practiced mostly at the village vegetable communal gardens, water for irrigation is obtained from underground sources using buckets to extract water from temporal shallow wells. Given the poor state of the wells, water availability was generally problematic particularly during the dry season. The poor husbandry practiced resulting in low yields and subsequent output realized from this enterprise was generally low due particularly to the poor practices including high plant density, broadcasting etc. Marketing bottlenecks and post harvest losses were particularly prevalent and were disincentives to further expansion.

Except in a few cases, most of the small scale irrigation for horticulture in URD is from underground water sources. This relies on a number of energy sources ranging from wind pumps, solar, motorized to mechanical using the bucket and rope. Most comprise of women operating village communal vegetable gardens growing onions, cabbage, leafy vegetables, bitter tomato and okra. In some cases, high valued crops such as Irish potato are produced and marketed.

Although technologies for post harvest processing and preservation have been promoted through a number of interventions, post harvest losses continue to be high due to poor production planning. Marketing bottlenecks continue to be experienced exacerbated by poor communication infrastructure.

There is great potential for enhanced small scale production and productivity in view of the endowment of URD with both surface and underground water. This potential could be tapped for both extensive and intensive agriculture. This could ensure year-round production of not only rice but also of high valued vegetables and fruits. It should be noted that the unleashing of the great potentials for small scale irrigation is marred by a number of constraints including:

1. huge capital requirements for extracting water;
2. lack of appropriate technology for small scale irrigation;
3. limited management skills on small scale irrigation;
4. limited leadership and management skills

4.4.7 NERICA (New Rice for Africa)

The NERICA is a rice combination of the two species of *Oryza Sativa* of Asia and *Oryza Glaberrima* of Africa obtaining better characteristics from both species. The rice has been developed by the West Africa Rice Development Association (WARDA) since early 1990s and has the following characteristics:

- Early maturity in 90 to 100 days;
- Drought tolerance;
- Resistance to African rice gall midge, rice yellow mottle virus and blast disease;
- Good taste and aroma;
- Non-shattering grains;
- Secondary branches on panicles;
- Responsiveness to mineral fertilization;
- High protein content of 10.5 %; and,
- Grain per panicle over 400.

Many constraints to rice cultivation in Africa could be resolved if NERICA is widely cultivated due to the above mentioned characteristics. Already, NERICA promotion projects are ongoing in many countries in Africa.

In The Gambia, NARI in 2002 obtained NERICA seeds and distributed them to 100 farmers in CRD and URD, with 50 farmers in each division. Each farmer conducted an experiment on a field of about a 10 square metres. In case of URD, 49 out of 50 farmers did not get favorable result due to the severe drought. In 2003, NARI obtained 8 tons of seeds of NERICA variety and 2 tons of local variety from Guinea and distributed it to farmers. However, none has been

distributed to URD. It is recommended that in the future, URD be involved in the promotion of NERICA, as the division has the potential for expanded rice production in both upland and swampy areas.

4.4.8 Coarse Grains

According to middlemen in Basse, coarse grains (Sorghum, Millet and Maize) and groundnut are exported from URD to Senegal as described in the Chapter 3. It is well known that the competitiveness of the Gambian coarse grains is high among Sahelian countries. FAO and NASS provide the following data which clearly show that coarse grain yield of the Gambia is considerably high among Sahelian countries.

Table 4.3 Yield per ha of coarse grains in Sahelian Countries

	Maize	Millet	Sorghum
Gambia	**1.393**	**944**	**995**
Senegal	1,049	490	600
Mali	1,357	400	560
Burkina Faso	1,320	430	550

Source: FAO and NASS
Note: Yields of crops are based on the average 1994 to 1997

4.4.9 Cooperative linkage with Farming Sectors

We have noticed that the linkage between the crop (agriculture sector) and the livestock sector is weak. In agro-pastoral system, effective linkages and well-organized relationship on both sides are very important. Figure 4.2 indicates the mutual relationship of agro-pastoral system. Sustainable development in rural areas can reach satisfactory levels when they cooperate mutually and are effectively linked especially in areas scarce in natural resources such as URD. Domestic animals cannot be alive without fodders from crop residues and the crop sector needs organic fertilizers to enrich soil fertilities through the fermentation of animal-origin manures.

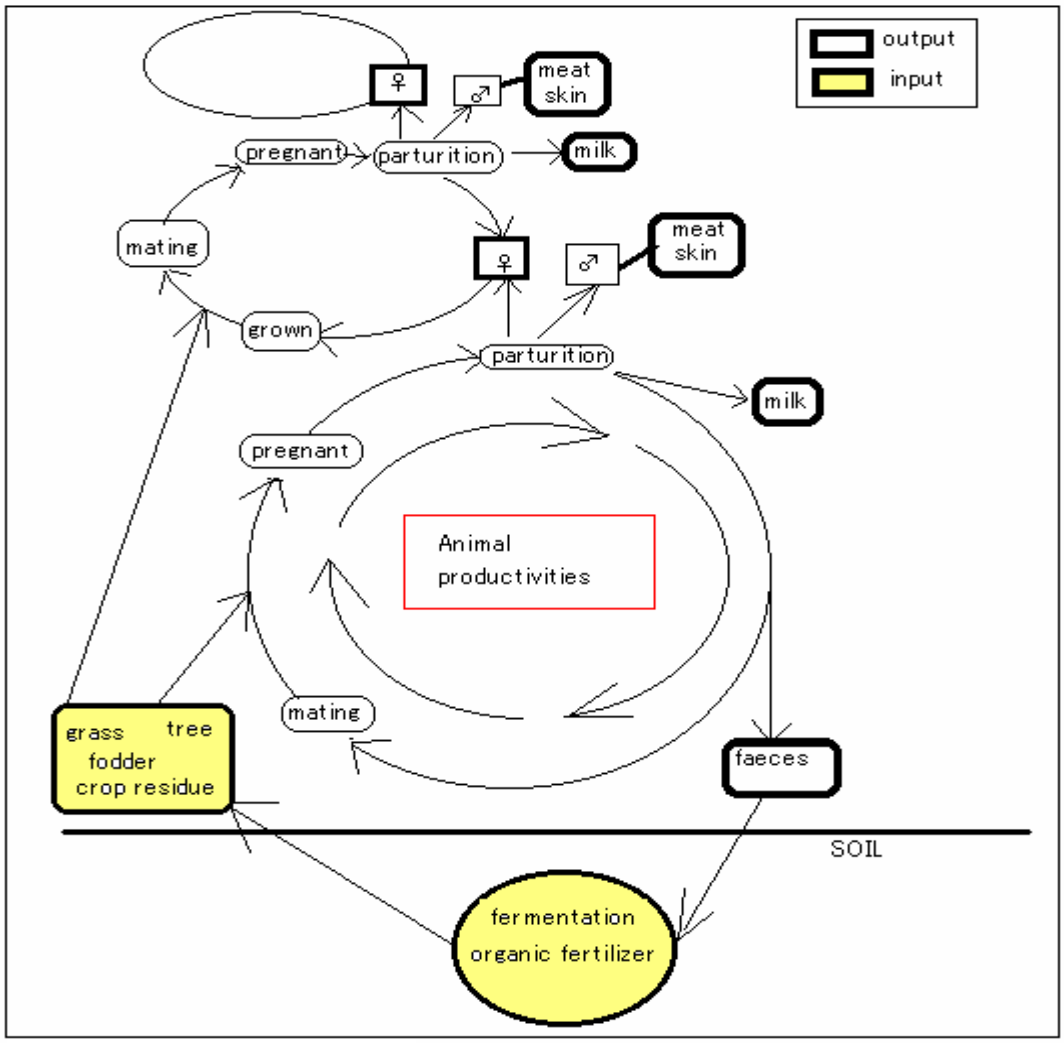


Figure 4.2 Linkage of farming and livestock

Source: The JICA Study Team

Chapter 5 Master Plan

5.1 Rationale

The government is currently implementing a pro-poor strategy as stipulated in the PRSP/SPA-II with the highest priority given to agriculture and other key sectors such as education and health. The programmes under the PRSP are focused on the following areas;

1) Poverty reduction;
2) Education,;
3) Health;
4) Population;
5) Nutrition;
6) Food Security; and
7) Employment creation.

The issues of the Study in the Master Plan are consistent with the PRSP and in line particularly with the pillars of SPA II. Therefore, the areas of focus have been hinged on poverty reduction, nutrition and food security, as the Master Plan is more directly concerned with the improvement of farmers' livelihood through agriculture and related activities.

The Master Plan aims at directing development efforts to the ultimate objectives, i.e. food security and poverty alleviation, in tandem with the country's long-term strategy for sustained development, *The Gambian Incorporated*, *Vision 2020*. The Master Plan will also be implemented within the framework of the ANR sector policy.
The Master Plan can therefore be considered as; ***"a divisional development program for the ANR sector in URD"***.

Sustaining livelihood of poor farmers, particularly women, through the enhancement of agricultural productivity and production will be emphasized in the Master Plan. It should therefore be viable financially, technically and be socially acceptable. The above-mentioned approaches are adopted in order to take into account of "Sustainable Livelihood", a key word in the Master Plan.

Within the ANR sector policies, the following are the major strategies relating to field crops, horticulture, livestock and household food security:

【Field Crop production】

- Introduction and development of crop varieties suitable for the various agro-ecological

zones in the country;

- Reduction of the heavy work load and drudgery particularly for women, to raise labour productivity;
- Alleviation of the labour bottlenecks especially at weeding; and,
- Establishment of an effective system for the production, storage and distribution of improved seed.

【Horticulture crops】

- Job creation and income generation by encouraging rural production of vegetables in the dry season; and,
- Increased consumption of vegetables and fruits to improve nutrition in the rural areas.

【Livestock】

- Increasing of rural incomes and use of livestock for animal traction;
- Decreasing of diseases of small ruminants; and,
- Improving soil fertility and ensuring an effective linkage between crop and livestock including ensuring sustainable feed availability during the dry season.

【Household food security】

- Enhancing food processing and preservation skills, including development of recipes.

5.2 Core Areas of the Plan

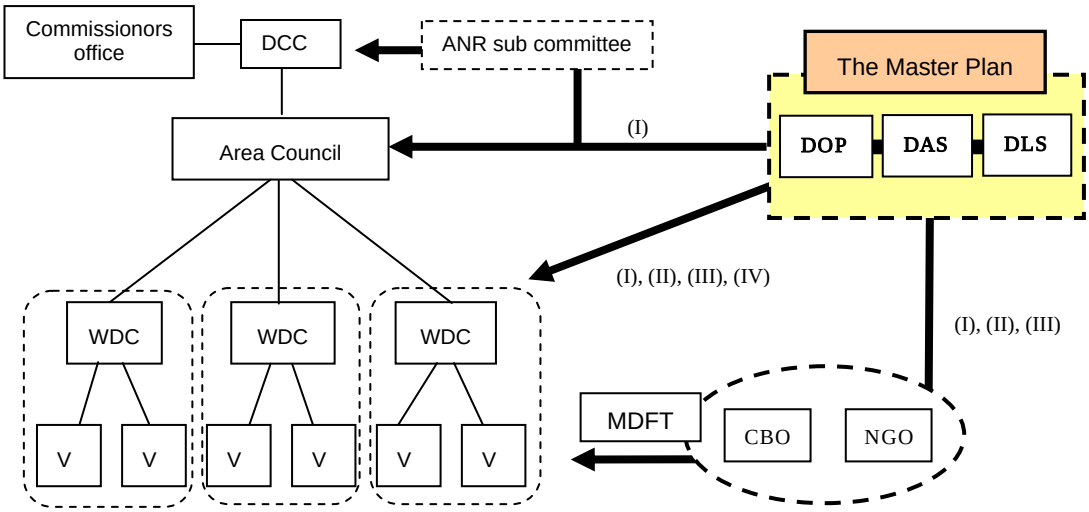
The overall objective set has to be strategically pursued considering the existing potential options. These were analysed through screening five social capitals in the area and survey of 60 villages, which indeed provided the Study a clear picture of what the Plan should focus on. This is to strengthen both capacity and coordination of service delivery by line departments, especially the DAO and DLS in this case, and private sector organisations including NGOs, CBOs and farmers' associations. Capacity building for technical staff of line departments at divisional level is inevitably needed, apart from intensive efforts which have been made for participatory development under several programmes supporting democratisation, decentralisation and liberalisation.

In fact, there are many programmes involving people on the ground but the technical aspects of the service are sometimes undervalued, or even ignored. Failure of projects can sometimes stem from lack of technical assistance by qualified experts. NGOs and CBOs are aware of the importance of obtaining technical advice for their programmes but do not have well coordinated activities with technical departments concerned. Therefore, it is relevant that the Study puts particular focus on building and strengthening the system of coordination between private sector endeavours and the public sector technical service provision, in order to fully exploit and

effectively benefit from development projects and programmes and contribute towards betterment of peoples' livelihood.

The Master Plan is geared towards agriculture and rural development for URD. However, given that several aspects of rural development including the strengthening of capacity at both community and local government levels for participatory development, have been promoted and implemented under several projects and programmes, principally the SDRD programme with a support from the EDF; the Plan focuses more on agricultural development through strengthening of community and public sector roles.

Figure 5.1 shows the expected inter-relationships of the Master Plan and the existing development structures in URD. The left side of the figure shows the existing development structure of community development at divisional level, that is, Commissioner, Divisional Coordinating Committee (DCC), Area Council, Ward Development Committee (WDC) and Village Development Committee (VDC), whereas the right side shows the agricultural departments concerned at the division and the Master Plan prepared under this Study. The thick lines indicate the flow of services improved through the implementation of the plan, from the agriculture and natural resources department to the existing system of rural development in URD.



AC: Area Council, DCD: Department of Community Development. WDC: Ward development committee,
V: Village development committee, DAS: Department of Agricultural Service, DLS: Department of Livestock Service

Figure 5.1 Enhancing the existing development system by strengthening Agricultural Extension in URD

These improved services include: (I) Technical Advice; (II) Training on Agricultural Techniques; (III) Technical Backstopping; and, (IV) Monitoring activities on agriculture related

projects and programmes. The numbers in Roman on the figure indicate which of the above mentioned services are being delivered to each of the targeted organisations and people. The catalyses of the service delivery are ANR sub-committee, MDFT and CBO/NGO.

5.3 Basic Concepts and Goals of the Master Plan

(1) Categories of Issues to be addressed

The issues addressed in this master plan were categorised into the following four topics through a Project Cycle Management (PCM) workshop held with agricultural extension officers in URD, inconsideration of national and sectoral strategies (Vision 2020, PRSP/SPAII, ANR Sector Policy 2001~2020), analysis of regional conditions (clarification of development subjects, evaluation of regional potential and review of existing projects), village surveys, and the status of agricultural extension with reference to residents' needs.

1) Improvement of Livelihoods

According to the PRSP (2002), the rate of poverty in the Gambia is the highest among groundnut farmers. Similarly, the Household Poverty Survey (1998) found that the study area, URD, had the highest rate of poverty in the Gambia at 80%, consisting of 73% in extreme poverty and 7% in poverty. The above survey also indicated that agriculture was the main source of income for 91% of those in extreme poverty and 72% of those in poverty. This situation prompted the Government of The Gambia to make poverty alleviation as the priority policy agenda. The alleviation of rural poverty should be achieved by reinforcing sustainable livelihood strategies. In the study area, the main sources of livelihood are rain-fed agriculture and animal husbandry, and consequently, the most important task for this development plan is to reinforce these, in order to improve livelihoods and alleviate poverty. With regards to the promotion of rain-fed agriculture, the main emphasis is on diversification of crops from groundnuts to vegetables and rice etc.

2) Enhancement of Living Conditions

Women play a very important role in the Gambian agriculture. This is particularly true in the study area, where the proportion of women growing groundnuts is considerably higher than the rest of the country. In spite of this, women continue to be also responsible for all household chores necessary for the daily life of the family; and the poorer the household, the longer the hours the woman must work. Under the ANR sector policy, the strategy measures proposed include labour and drudgery reduction for women, improvement of labour productivity in crop production, increased consumption of vegetables in order to improve nutrition in rural areas, and improvement of food processing and preservation skills including provision of recipes to

enhance the level of household food security. In tandem with the above, this development plan centred on agricultural activities focusing on reducing women's heavy work load and drudgery, improving nutrition and ensuring household food security.

3) Strengthening of the Extension Administration System

In the study area, various donors and NGOs have been providing support for rural development, with each adhering to its policy. These interventions usually involve the active technical support of the Divisional Agriculture Coordinator, Divisional Livestock Officer and their staff consequently support need to be provided to enhance their coordination capacities. Most of the interventions of donors and NGOs are of limited duration and as such farmers cannot expect continuous assistance. In this regard, the extension administration should be actively involved in its role of providing the necessary information to farmers and their organizations. However, with the current level of funding and personnel, it will be difficult for them to provide farmers with greater support than what they have been doing until now. In this development plan, therefore, one of the key development issues is to establish an efficient extension system, through measures such as building an agricultural information databank, and strengthening technical coordination capacity toward development assistance.

4) Promotion of Beneficiary Participation

As emphasized in the PRSP/SPAII, beneficiary participation is essential for the alleviation of poverty. Under the recently completed SDRD programme in URD, the first Community Action Plans (CAP) were prepared in all villages, which enabled the collation of bottom-up needs. Subsequently, the Ward Development Plans were drawn up for each ward, based on the CAPs. This development plan was drafted based on the CAPs and Ward Development Plans, and therefore provides a menu of micro-project options. Consequently, farmers' groups and communities will have opportunities to make their selection from "a basket of choices", with the support of extension workers, ward councils and other channels. This development plan emphasizes beneficiary participation in all stages of the project cycle-from project development to implementation.

(2) Goals

The long-term goal for this development plan is to alleviate poverty among poor farmers in the study area, in line with the PRSP/SPAII and the ANR sector policy, and thereby improve livelihoods through increasing agricultural production and productivity. At the same time, the plan will work to improve nutrition and raise household food security. The period for this development plan is ten years, from 2006 to 2015.

5.4 Development Strategy

To attain the goals stated under the basic concepts, the development plan will involve the implementation of the following four programmes as development interventions, in line with the development issues and potential examined in Chapter 4. For the sake of resident-led project operations, each programme comprises of projects, which do not require large investments and are focused mainly on technology transfer and capacity building.

(1) Programme Strategy

The selection of the programmes in the Master Plan was made following an analysis of rural livelihood conditions in URD. Constraints and potentials elucidated from the preliminary examination of the five capitals in rural area were carefully reviewed and development programmes that could address and capitalise on these were formulated, namely: A) Livelihood Improvement Programme; B) Improvement of Living Conditions Programme; C) Technical Support Service Strengthening Programme; and, D) Capacity Building Programme for Communities.

A) Livelihood Improvement Programme

Objective: For upland crops, vegetables, rice and livestock, which are important sources of livelihood in the study area, the utilization of local resources, traditional skills and techniques will be reviewed and improved techniques are introduced with the aim of stabilizing and reinforcing these sources of livelihood. It is important for farmers to shift from dependency on groundnut cultivation and diversify their crops. This program emphasizes on vegetable and rice production. Given that lowland rice interventions have recently been implemented by LADEP with support from IFAD/ADB, this program will emphasize on promotion of upland rice by assisting and strengthening rice farmers' organizations amongst others.

B) Improvement of Living Conditions Programme

Objective: Improvement of food security within villages and households (through small-scale food processing, seed banks), and mitigation of labour burden and drudgery on women. A range of activities, including promotion of vegetable production, compost making and production of processed goods, will be carried out in an integrated manner, mainly targeting women's groups.

C) Technical Support Service Strengthening Programme

Objective: Agricultural extension services in the study area generally experience limited

liaison and coordination between government extension organizations, donors and NGOs. This programme aims to strengthen technical support to farmers, prepare a database of agriculture-related information, and build the coordination skills capacity of the Divisional Agriculture Coordinator and Divisional Livestock Officer and their staff.

D) Capability Building Programme for Communities

Objective: The lessons of community-based projects have revealed several problems, including a lack of beneficiary ownership of the projects, a lack of problem-solving ability, and a culture of dependence. Based on those lessons, this programme will provide technical training for actions that beneficiaries should take to maintain sustainable livelihoods.

Role of Each Programme

The programmes selected in the Master Plan are to be closely interlinked and interactive with each other. While each of the proposed projects and programmes in the Plan, could bring about positive impact by itself; sustainability especially of those related to dissemination of agricultural technologies, can be better enhanced when implemented with the components of capacity building for divisional staff and communities.

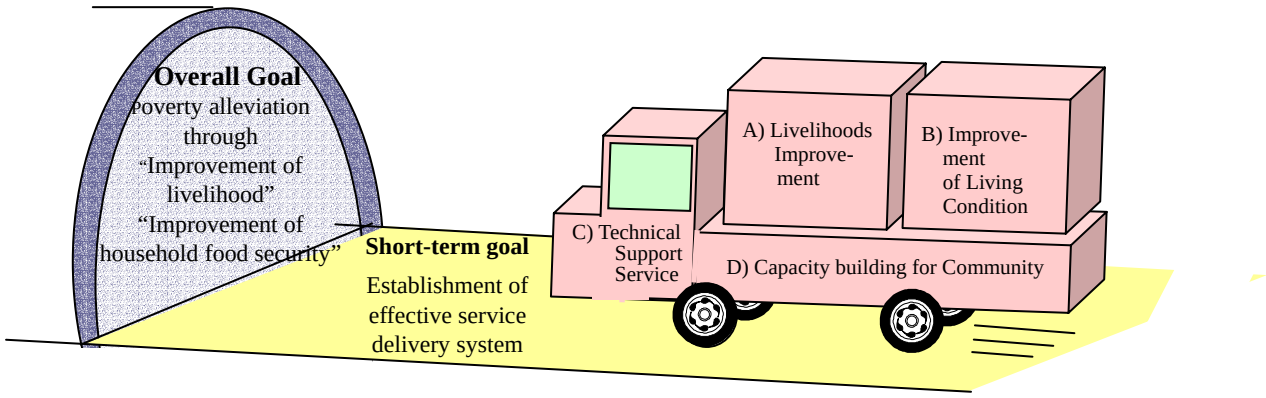


Figure 5.2 Relationship between Programmes in the Master Plan

As shown in Figure 5.2, the first two programmes aim at agricultural development for improvement of livelihoods and better living conditions and have to be supported by capacity building efforts for communities, since the primary target in each of the above programme is the communities - as if were the body of a lorry carrying the load of the programmes to the goal. But a lorry cannot accelerate sufficiently without a quality engine. Reliable delivery systems of agricultural technical support services have to be established, which is supposed to work as the engine of the lorry. Therefore, strengthening of the services and its delivery system is inevitable.

It can facilitate better implementation and ensure sustainability of future projects, not only of the programmes in the Master Plan. Consequently, the capacity of villagers and that of agricultural officials including extension workers and also technical personnel of NGOs at local level should be enhanced and closely linked. That link known as 'Bridging Social Capital' is required for the establishment of the system. As mentioned earlier, this is a major focus of this Master Plan.

(2) Technical Strategy by Sub Sector Intervention Area

The agricultural sector in URD is characterized by subsistence rainfed food crop production, traditional livestock rearing, semi-commercial groundnut and cotton production, and small-scale gardening activities. Overall, agricultural production and productivity are low. The system is characterized by high risk, low investment in small production units culminating in low input use and thus giving rise to low production and marketed output. Livestock production systems are predominantly traditional, although linkage between crop and livestock are becoming more important particularly to ease the maintenance of soil fertility on the upland and to reduce women's heavy work load.

In line with the ANR sector policy and the above mentioned programme strategies, the development plan will focus on areas such as field crops, vegetables, livestock and NERICA as priority intervention areas in terms of the agricultural sub-sector. Major issues, actions to be taken and appropriate project responses (including ones by other donors) on the priority intervention areas of this development plan are summarized as follows;

1)Upland

Major Issues	Actions to be taken	Project Response
■Low Soil Fertility	• Prevent topsoil erosion • Apply organic fertilizer	⇒ Training on contour cultivation ⇒ Promotion of mixed farming ⇒ Contour bunds and vegetative hedgerows such as vetiver grass(IFAD)
■Low yields of coarse grains (millet, sorghum)	• Apply organic fertilizer • Retain soil moisture	⇒ Promotion of mixed farming ⇒ Contour bunds (IFAD)
■Soil Erosion	• Prevent soil erosion	⇒ Training for contour cultivation ⇒ Contour bunds and vegetative hedgerows such as vetiver grass (IFAD)
■Over-dependency on groundnuts as sole cash crop	• Diversify crops	⇒ Promotion of NERICA ⇒ Vegetable processing/preservation ⇒ Improvement of small ruminant production ⇒ Promotion of lowland rice (IFAD)

■ Inappropriate tractor use on upland aggravate soil erosion	• Train operators	⇒ Faming practice improvement project

2) Lowland

Major Issues	Actions to be Taken	Project Response
■ Weak capacity of rice growers association	• Conduct Training on organizational management skills • Conduct Sensitization on group activities	⇒ Strengthening of rice growers association ⇒ Organization management skills training
■ Weak extension follow- up on lowland rice sites	• Establish core farmer to farmer extension system	⇒ Strengthening of rice growers association ⇒ Faming practice improvement project

3) Vegetables

Major Issues	Actions to be taken	Project Response
■ Traditional production skills	• Train on core improved technologies	⇒ Faming practice improvement project ⇒ Small scale food processing/preservation
■ Poor market information	• Establish market information networks	⇒ Agricultural Marketing Database Project
■ Lack of processing/preservation skills	• Train on core improved technologies	⇒ Faming practice improvement project ⇒ Small scale food processing/preservation
■ Lack of business skills	• Train on business skills	⇒ Entrepreneurial skill training ⇒ Organisation management skill training
■ Poor access to water	• Dig wells	⇒ Small-scale food processing/preservation ⇒ EDF programmes

4) Livestock

Major Issues	Actions to be taken	Project Response
■ Low productivity of extensive livestock system	• Conduct vaccination campaigns • Establish intensive feed gardens	⇒ Improvement of small ruminant production ⇒ Fodder production around households project
■ Shortage of oxen for animal traction	• Use donkeys and horses	⇒ Animal traction project ⇒ Training and promotion of mixed farming
■ Dry season shortage of natural pastures	• Establish intensive feed gardens	⇒ Fodder production around households project ⇒ Training and promotion of mixed

		farming

5) NERICA

Major Issues	Actions to be taken	Project Response
■ Seed availability	• Establish farmer-based seed multiplication • Produce purified seed	⇒ Promotion of NERICA ⇒ NARI
■ Climatic adaptability	• Continue the study	⇒ Promotion of NERICA ⇒ NARI
■ Adaptability on upland system	• Continue the study	⇒ Promotion of NERICA ⇒ NARI

5.5 Development Plan

Following from the Programme and Technical strategies as well as lessons learnt through the implementation of the verification project, 19 components were finally identified in the Study in order to achieve the goal of the Master Plan. Among the programmes, the Plan highlighted those that are most promising and highly likely to be practiced with low cost and with materials available in the area, and integrated those aiming at similar objectives. There are four categories in which the highlighted and integrated programmes are fitted. The first programme, A) Livelihood Improvement programme comprises of nine project components, mainly targeting farmers' agricultural activities. The second one, B) Improvement of Living Condition Programme consists of three project components, main target of which are also the farmers. The third one, C) Technical Support Service Strengthening Programme has five components. These are meant for capacity building of the department staff which ultimately should result in betterment of communities' livelihood. Finally, the last programme, D) Capacity Building Programme for Communities comprises of two project components aimed directly at the communities.

Table 5.1 shows the project components and expected outcome under each programme constituting the Master Plan. The details of each project component are shown in Project Description in Appendix 5.1. In order to enhance usability of the Master Plan, the Description not only shows a menu of project components, but also presents the details of each project by mentioning project schedule, necessary inputs, project cost and so forth

Table 5.1 Contents of the Master Plan

Programme Name	ID	Project Name	Output Expected
Livelihood Improvement Programme	A-1	Farming Practice Improvement Project	1) Introduction and adoption of optimum farming practices suited to local condition in the URD started
			2)Giroba Training Center established and managed by DAS
			3)Quality extension services promoted
			4)Useful extension manual developed
	A-2	Seed Replacement Project	1)Quality seeds distributed timely
			2)Better yield achieved
			3)Significance of replacement of seeds recognized by farmers
			4)Sustainable seed replacement system established
	A-3	Strengthening Rice Growers Association	1) Good maintenance system for rice production facilities/infrastructure/water management system including drainage introduced
			2) Rice production facilities enhanced
			3) LADEP facilities repaired / maintained
			4) Stable production of rice achieved
	A-4	Promotion of NERICA	1)Production system with pure NERICA seeds established
			2)Growing NERICA initiated by many farmers
			3)NERICA production increased
			4)Timely seed distribution achieved
	A-5	Study on Pre and Post Harvest of Rice Sector	1)Suitable total system of storing, transporting, husking and milling identified
			2)Post-harvest loss of rice decreased
			3)Importance of storage, proper transport, husking and milling recognized by farmers
			4)More suitable policy making on rice production suggested
	A-6	Compost Farming Project	1)Production of compost acquired by farmers
			2)Sustainable production of vegetables promoted
			3)Stable production of safe vegetable increased
			4)Improved land by using compost
	A-7	Fodder Production around Household Project	1)Fodder grown around household increased
			2)Production of high nutritious value fodder increased
			3)Stress on livestock mitigated
			4)Small-scale self-fodder-supply system for the dry season in URD established
	A-8	Improvement of Small Ruminant Production	1)Disease and loss of animals understand by many farmers
			2)Intensive feed gardens prepared
			3)Loss of household decreased
			4)Productivity of small livestock in URD improved
	A-9	Animal Traction for Women	1)Animal traction technology acquired by Women
			2)Women's work load mitigated
			3)Farm field expanded and products increased
			4)Increased income achieved
Improvement of Living Condition Programme	B-10	Small Scale Food Processing / Preservation	1)processing / preservation techniques acquired by a large number of farmers
			2)Nutritional status of peoples' in targeted villages improved
			3)Loss of vegetables decreased
			4)income for women groups from marketing of fresh vegetables and processed goods Increased
	B-11	Cereal Bank Management	1)Cereal stores repaired
			2)Importance of a cereal bank understood by farmers
			3)Cereal bank managed properly
			4)Food shortage eased
	B-12	Introduction of Labour Saving Devices for Women	1)Sustainable milling and threshing service become available to communities
			2)Women's work load mitigated
			3)Machines utilized properly
			4)Technical and financial management skill acquired by communities
Technical support Services Strengthening Programme	C-13	Resource Mapping for Extension Workers	1) Communal land and private land recognized
			2) Development plans based on the maps established
			3) The maps created in many areas
			4) Extension work progressed effectively and efficiently
	C-14	Training on Livestock Management and Disease Control	1) Morbidity and mortality of livestock in rural areas decreased
			2) Skills in livestock management by households Improved
			3) knowledge and skills Disseminated to other divisions
			4) Integrated agricultural development achieved including livestock management and vegetable production
	C-15	Coordination Skill Development at Divisional Level	1) Well-presented report for the committee prepared
			2) Development policies and activities promoted
			3) Periodical information flow from donors and NGOs to agriculture related office established
			4) Integrated development achieved in the URD
	C-16	Agriculture and Marketing Database	1) Database of agricultural and rural development related information, and price information prepared and updated
			2) Data updated periodically
			3) An extension plan based on the data collected prepared
			4) Database effectively utilized
	C-17	Training and Promotion of Mixed Farming	1) Demonstration organized by farmers and DEC
			2) Farmers and extension workers acquire production techniques in the multiple field
			3) Extension activities promoted
			4) Extension workers' abilities improved
Capacity Building Programme for Community	D-18 D-19	Organisation Management Skill Training / Entrepreneurial Skill	1) Deeper understanding of project by villagers involved
			2) Favorable impact on sustainability of development projects seen
			3) Farmers' business skills improved
			4) Literacy rate and bookkeeping ability improved

: Projects possibly implemented by community initiative

Project summary

A-1. Farming Practice Improvement Project: The project aims to encourage the newly constructed Giroba centre of 412 m^2 to play the role as the divisional training centre in order to improve general technical capabilities in URD. At the same time, the establishment of the information network between Giroba centre and other DECs, CBOs and NGOs will be encouraged. The benefit from this project is to increase agricultural productivity of the farmers in URD by providing training to 30 core farmers from each DEC catchment annually.

A-2. Seed Replacement Project: The project aims to solve the situation in which quality groundnut seeds are chronically lacked. The government provides good-quality seeds that are grown by contract farmers or in other areas. These are to be exchanged for seeds which farmers currently grow. Groundnut production will be boosted up by 10 % for at least three years after the exchange. Within the three years, the community has to set up the replacement system themselves.

A-3.Strengthening Rice Growers Association: The facilities for rice production installed under the LADEP project need to be maintained by beneficiary participation in good conditions. In this regard the project aims to set up good management systems by forming or strengthening the existing rice growers' associations. At the same time, the DAO extends technical know-how to 19 LADEP facilities in URD. Inputs for the project include training and materials for maintenance.

A-4.Promotion of NERICA: The main objective of the project is to set up a system to expand cultivation of NERICA varieties in URD by following up on the JICA verification study, in order to collect the necessary information for dissemination of NERICA at the initial stage. An establishment of the provision system of good quality NERICA seed is urgent. The benefit from this project is increased rice production which could reduce outflow of cash at household level for food.

A-5.Study on Pre- and Post-Harvest on Rice Sector: The project aims to investigate storage, transportation, de-husking and milling methods in the Gambia in order to understand the market possibility of rice in URD. This could also suggest the way forward towards substitution of imported rice with increased rice production and marketing within the area.

A-6.Compost Farming Project: This project will provide training to farmers on using quick maturing compost. Production of vegetables will be particularly promoted under the project. Many farmers should recognize the significance of improving composting in order to produce quality vegetables at less cost, and the importance of the effective use of available organic resources.

A-7.Fodder Production around Household Project: The change of vegetation from inedible plants to edible one around households would brings many advantages to the owners of livestock. It will relieve livestock from the stress of hunger at the end of dry season. The project will provide seeds of Laucaena and Legumes under the supervision of Department of Livestock Services (DLS). Supplementary nutrients with the feed would enhance nutrition and health of livestock.

A-8.Improvement of Small Ruminant Production: This project has the global objective of reducing poverty in the affected livestock rearing communities. The specific objectives comprise the following: 1) reducing disease incidences in small ruminants; 2) improving feed availability; and, 3) improving housing. The main activity is to provide vaccination amounting to around 40,000 doses. The benefit would comprise decrease in mortality of livestock by 15 %, hence increasing income.

A-9. Animal Traction for Women: With this project, women will be able to either culminate in saving time and labour for other purpose or using the time for expanding their farm sizes. It should contribute to either labour saving or incremental income generation. With this project, women become able to get involved in activities that will mitigate heavy labour and drudgery imposed on women. Inputs of this project include draft animals, farm implements together with the necessary extension advice by VEWs. Increase in income would be achieved especially for the women with small cultivated area.

A-10. Small Scale Food Processing/Preservation: This training aims to give women groups the opportunity to diversify their consumption, improve nutritional status, improve their knowledge and skills in various processing/preserving techniques and finally increase their incomes. This project intends to continue and expand the small-scale food processing/preservation project for income generation as well as improving household food security.

A-11. Cereal Bank Management: With the training, the community will be able to manage a cereal bank and improve its food security status during the rainy season. Millet, sorghum, maize, groundnuts, and rice will be targeted for storage. It eventually will decrease post-harvest losses. This project will be established from foundation stock invested by farmers and will utilize the bank so that the community will be hardly influenced by price fluctuation of cereals.

A-12. Introduction of Labour Saving Devices for Women: This project aims at providing trainings on management of machines for communities for sustainable use so that women's drudgery would be eased. Additional benefit from this project is that women use their time saved for other income generating activities which boosts their income at household level.

A-13. Resource Mapping for Extension Workers: VEW prepare a map that shows activities of the rural communities, especially land use and farming system, cereal storage and collection points of produce. The project aims to improve extension service delivery and enable VEW to grasp village more clearly with the map prepared. These maps will further aid the selection of target villages for projects proposed in this Master Plan.

A-14. Training on Livestock Management and Disease Control: Since proper livestock management contributes significantly to the improvement of the economic status of households in rural areas, the project aims to let target groups obtain knowledge about livestock management ranging from animal feed, vaccination to instant diagnosis. LAs are to be encouraged to acquire the latest technologies.

A-15.Coordination Skill Development at Divisional Level: During the verification stage, it has been proven that effective coordination between the technical departments and the other development related offices and projects could result in achieving better output from development interventions. The project therefore needs to be conducted continuously in order to maximize output from any development projects and activities.

A-16.Agricultural and Marketing Database: The project aims to build a database of information on agriculture and rural development related infrastructure and activities, as well as on prices and marketing channels of agricultural products, all of which are essential for the preparation of farming plans. It will also be useful in determining, the comparative advantage especially of local vegetables against those from Senegal, as well

as providing persuasive information to other donor organizations.

A-17. Training and Promotion of Mixed Farming: This project will encourage the linkage between crop and livestock through an integrated extension service. Extension workers will acquire knowledge about multiple fields in order to respond to farmers' various needs. They will then be able to promote several agricultural activities. Extension workers work as collaborators for farmers in terms of livestock and fruit production.

A-18.Organization Management Skill Training: Villagers have to understand more why a project has to be sustainable and what they have to do for sustainability. In this regard, trainings should be conducted together with other projects proposed such as A-2, A-3, A-9, B-10, B-11, B-12 and it is desirable they are conducted during the off-farm season.

A-19. Entrepreneurial Skill Training: There are many farmers facing difficulties in starting up new agricultural activities even on the small scale due to lack of sufficient initial capital. Recently some microfinance institutions have been established to provide financing for agricultural activities for short periods –the longest being two years. This training would equip farmers with business acumen to run enterprises in a feasible manner. This training should be given to farmers before they commence the implementation of Program A and B under this Master Plan.

5.6 Priority Ranking for Implementation

Using the criteria set forth together with the above mentioned strategies, priority among the nineteen project components were examined in order to develop an implementation plan of the Master Plan. The criteria used and priority projects are shown below. (Refer to Table 5.3)

Criteria used for prioritizing 19 projects in the M/P

① Level of contribution to raising living standards of farmers, which is the main aim of the M/P (Contribution to livelihood)
Does the project make a direct contribution to raising farmers' living standards?

② Suitability of the skill levels at the divisional agriculture office and divisional livestock office (Skill level of Dept.)
Does the project fit the staffing and capacities of the two offices, which have an important role in providing technical support for project implementation?

③ Suitability for the skill levels of farmers (Skill level of farmers)

Is there a large gap between the current skill levels of the target group and the level needed for the project? Can the requisite skill level be attained within the period of the project?

④ Time required to achieve the project goal (Required time to the goal)
Can the project be expected to achieve the effects/impacts within a short time frame?

⑤ Scale of funding
Does the project require large-scale funding? And are the sources of funding easily accessible?

Priority Projects among the 19 components

Based on the selection criteria, the following 9 Priority Projects were selected through the analysis and should be implemented in the early phase of the Master Plan. These are:

1. Farming Practice Improvement;
4. Promotion of NERICA;
6. Compost Farming;
8. Improvement of Small Ruminant Production;
9. Animal Traction for Women;
10. Small-scale Food Processing/Preservation;
15. Training on Livestock Management and Disease Control;
16. Coordination Skills Development at Divisional level; and,
17. Agriculture and Marketing Database.

5.7 Implementation Structure

The nineteen (19) project components presented in the M/P are desired to be implemented according to the implementation plan as indicated in the previous section. The implementation plan shows the desirable number of projects and the time frame of project implementation in order to achieve the objectives set forth for the Master Plan. However, the government at both central and local levels might face difficulties in mobilising the requisite funding for its implementation. However, even if it is partly implemented, agriculture and rural development in URD should progress in the right direction through the implementation. In this regard, any effort to implement the plan by any organization and community, in this case VDC, WDC and also NGO/CBO, is encouraged. As mentioned earlier, the project menu comprises of projects geared to the implementation of the agricultural policy of DOSA (institutional plans) and those based on Community Action Plans which are prepared using the bottom-up approach under the decentralization policy in the Gambia. Therefore, it is possible for these local development structures to start implementing the projects based on Community Action Plans, characterized

by their small-scale and low-cost nature.

Consequently, it can be said that the Master Plan has a two pronged approach for its implementation. One approach is the full implementation of the plan through the central or local government structures which is desired according to the implementation schedule (Figure 5.3 Implementation Plan of the Master Plan). The other is for the implementation of the Community Initiative Projects through the local development structures according to availability of finance and personnel in the division (Figure 5.4 Implementation Structure). The local development structures can take action independently, either ward by ward or village by village, by referring to the Master Plan. However, they need to bear in mind that independent implementation should be coordinated with the departments providing technical supervision.

Project Implementing Agency can be any of the following; Agriculture related departments, the local government – Area Council, Ward Development Committee(s), Village Development Committee(s), and NGO/CBO. When the whole plan is to be implemented by the government, the PIU should be duly set up, led by Agricultural departments with two or more additional staff from the central government.
Project Management Unit comprising of the members from Department of Agricultural Services, Livestock Services and Planning of DOSA, Community Development Office, Commissioner's Office, and Area Council. The unit provides an advisory function to the implementation bodies during the various stages covering planning, implementation and management of the projects.

5.8 Preliminary Examination of Funding

Another important issue is that the Master Plan should be feasible and manageable by both the Government of the Gambia and development structures including communities in terms of both its financial and personnel requirements. Since just formulating a plan does not make an impact on the final target people- the poor, the plan has to be implementable. Therefore, seeking ways to enable organizations concerned to secure and allocate budgetary resources for these projects using the best possible options of the below mentioned funding sources has to be sought.

(1) Existing funds

The rural development programmes in the Gambia receive funding assistance from various development partners (aid agencies, donor countries, NGOs, etc.), according to their individual schemes.

Social Development Fund (SDF – ADB support)

The SDF is operated nationwide, but it mainly provides grants to communities (milling machines, vegetable gardens, and dairy processing facilities) and micro-finance support. These assistances however have largely been in the domain of providing infrastructure without providing enough consideration to strengthening the technical and organizational capacities of technical agencies and communities. Some of the project components and areas in the Master Plan might be covered by the Fund. In order to ensure sustainability of project gains, it is pertinent that emphasis be made not only on the construction of facilities and provision of equipment and materials (hardware), but also on improving technical and organizational capacities at the agency and community levels (software).

European Development Fund (EDF – EU support)

The EDF has been active in URD for more than ten years, implementing different types of projects. One of these provides financial support to the Area Council and destined for implementation of development projects identified by the communities. Once the communities identify plans in the Master Plan consistent with the Community Action Plans, there are possibilities that it could be implemented using the fund.

(2) The Divisional Development Fund (DDF)

The establishment of divisional development funds within the local government structures is under consideration, with assistance from the 9th European Development Fund Program. However, as of July 2005, no specific and concrete plan has been drawn up.

(3) Securing Donor funding through Central Government Leadership

As described above, there are still no firm prospects for the establishment of the DDF, and the decentralization process is an ongoing process, and hence securing funding for community projects and Department-led projects alike will depend on the coordination and resource mobilization capacity of the technical agencies comprising of the divisional agriculture office, the divisional livestock office and Department of State for Agriculture.

5.9 Implementation Procedures

The implementation of the Master Plan is dependent on either the central government or the local development structures. However, the local development structures do not need to wait for the implementation of the plan by the Central Government. They can start with a project component they can do in the plan as far as it matches their potential and capacity.

Figure 5.5 shows the flow of project implementation by the department, starting from

reassessing of the plan, requesting for approval from DOSA and forming necessary implementation bodies to actual implementation. Figure 5.6 presents flow of implementing project components by the local development structures. The starting point can be at any level, village, ward or division. When needs are identified, and they match with the components in the Master Plan, organizations concerned can just start taking action according to project descriptions and departmental guidance. Support from DAS to WDC and MDFT in the selection of projects is of highest importance. Another important points which they should consider include not only matching their needs with the project components but also their development potential and priorities in the area as well. For this purpose, they can use the maps and data sets as well as consult with the departments.

As mentioned earlier, URD has been one of the model divisions of the decentralization process in the country. Under the process, a ward has become regarded as an important organization of project identification and therefore received financial support from the EDF programme. The programme disburses funds to the division; accordingly the funds are divided into 14 wards considering population of each ward. Hence, the wards are expected to have financial resources for implementing Ward Development Plan. The Master Plan is to accommodate some community projects listed in Ward Development Plan and provide specific technical advices to each project. Among them, the Master Plan suggests appropriate projects for each ward through analysis on their needs and potential. This is to enhance the implementation of the project of the Master Plan at ward level. MDFT is one of the crucial actors in the project identification, since the extension workers constituting MDFT have frequent contacts with VDCs. Since as their routine, they support VDCs for identifying their felt needs and selecting priority community actions among others, importance of the involvement of MDFT cannot be overemphasized

5.10 Expansion of beneficiary areas

Another salient feature of the Master Plan is that the Plan promotes expansion of areas which benefit from the implementation of the projects. In the verification stage of the Study, capacity building projects tailored for department staff, namely, Coordination Skill Development Programme, was implemented in order to capacitate them so that they can sustain other verification projects and also start up new projects proposed in the Plan. The Programme achieved satisfactory results to the extent that the department staff became confident not only in planning, implementation, monitoring and evaluation, but also in expanding several activities to beneficiary areas. Such activities conducted by the department staff during the verification project included 1) steering Committee at divisional level; 2) Monday staff meetings within

DAO; 3) coordination with several CBOs; 4) field days for farmers; 5) publicity through radio programmes; 6) frequent presentation at DCC; 7) publication of Newsletters; and 8) seminars inviting all ward councillors. The following are important roles to be conducted by each actor in order to implement projects and expand their impact to other areas.

Table 5.2 Roles of each stakeholder in Community Initiative Projects

	Project Identification	Project Implementation / Monitoring	Expansion to other areas
Central Government （DOSA）	―	・Subsidy for starting up projects	・Tour by the Minister ・TV programme ・Collaboration with NARI
DAS・DLS	・Support for project identification and site selection	・Technical assistance	・Field day ・Radio programme ・Newsletter ・Presentation at DCC
DCC	・Support for project identification and site selection	・Holding a stakeholders meeting	・Presentation at DCC
Area Council	・Discussion with DAO, DLS ・Drawing up development budget	・Confirming status of spending budget	・Execution of development budget
WDC	・Discussion with DAO, MDFT ・Distribution of development budget	・Confirming status of spending budget ・Contact with DAO	・Receiving farmers in other villages ・Reporting result of project to Area Council
VDC	・Discussion with MDFT	・Contact with DAO	・Receiving farmers in other villages
NGO、CBO etc.	・Discussion with DAO, MDFT	・Contact with DAO	・Presentation at DCC

5.11 Presentations of the Master Plan (M/P)

The formulated Master Plan is presented considering the following points and with a view to the suitability of its use in the Upper River Division (URD).

(1) Role as a Technical Guide

Many of the community projects implemented to date within URD were not thoroughly planned. The action plan for the M/P includes guides on technical points to be considered, as a basis for reviewing existing projects, and for implementing new projects. Target zones are also indicated, based on a status

analysis.

(2) Role as a Guide for Selection of target area and project

All 14 wards have their Ward Development Plans consisting of needs from villages constituted, but they are not entirely based on analysis of potential and constraints of each ward. This Manual offers various data relating to past development activities in each ward with which each ward is able to know its potentials and constraints. Recommended projects for each ward are shown in Figure 5.6.

In order to play a role as a guideline, this Manual constitutes the following contents.

(1) Flow of project identification

The flow of selection and identification of project at each level of village, ward and division are presented.

(2) Preparation of a programme (or a project) summary chart

The purpose of the project, the target groups, the main activities, inputs, executing agency, priority areas (or potential areas), anticipated effects and other aspects are summarized. (Appendix 5.1 Project Description)

(3) Potential Mapping

Mapping of potential areas, needs by ward level, areas where major existing projects are implemented/located, the status of key rural infrastructure developed, and other aspects. Major development-related matters are listed and mapped, so that they can be used in reviewing target areas and facilitating sites selection at the implementation stage. (Appendix 5.2 Data maps)

(4) Data, graph and documents regarding potential and constraints of each ward

For the purpose of promoting participation of various stakeholders, the Manual for implementation of the 19 project components was prepared as a separate volume to be distributed mainly in URD.

Economic analysis of the plan

The benefit of the plan can be measured by the contribution to the strengthening of extension delivery services and the capacity building of the community which lead to future production improvement in the agricultural sector. The main activities as shown above are the trainings of various activities. The total number of the beneficiaries from the community would be about 6,400. It is rather difficult to quantify the effect of the trainings directly. Therefore, the estimation of the benefits accruing to project beneficiaries was done based on differences in

production which are assumed to be achieved after the trainings and the project implementation.

When the whole plan as a single plan is to be implemented in an ideal manner, EIRR would be 25.3 %, which is favourable against 15 %, the DOSFEA's criteria of selecting projects. This is due to exclusion of the sunk cost borne by the other development partners, resulting in achievement of low cost - high return. . As mentioned earlier, the plan includes some activities to reactivate the existing but dormant system or association in order to boost their effectiveness. (See Estimated Cost of Master Plan in Appendix 7.1 in the Annex and Cost Benefit Analysis in Appendix 7.2 in the Annex)

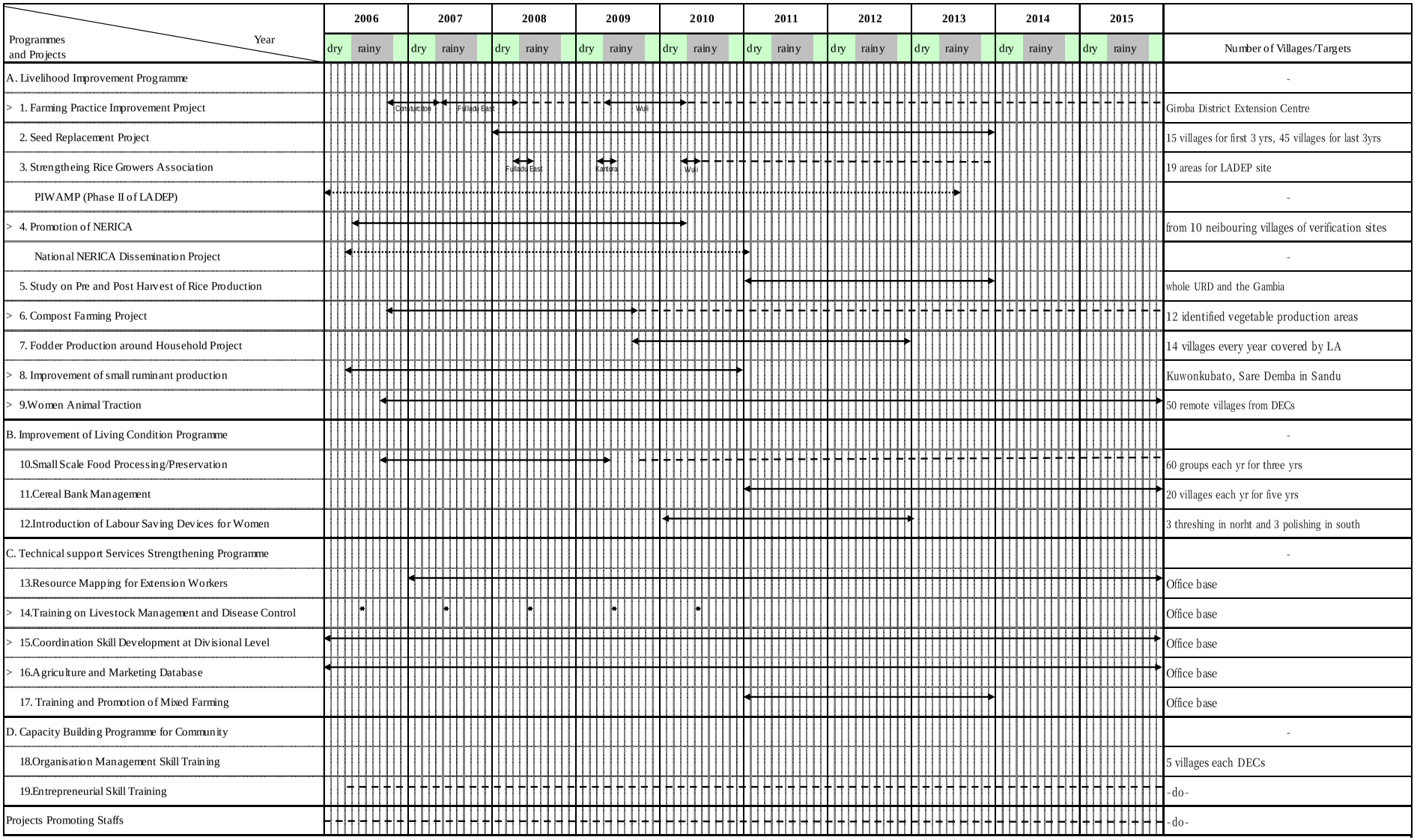
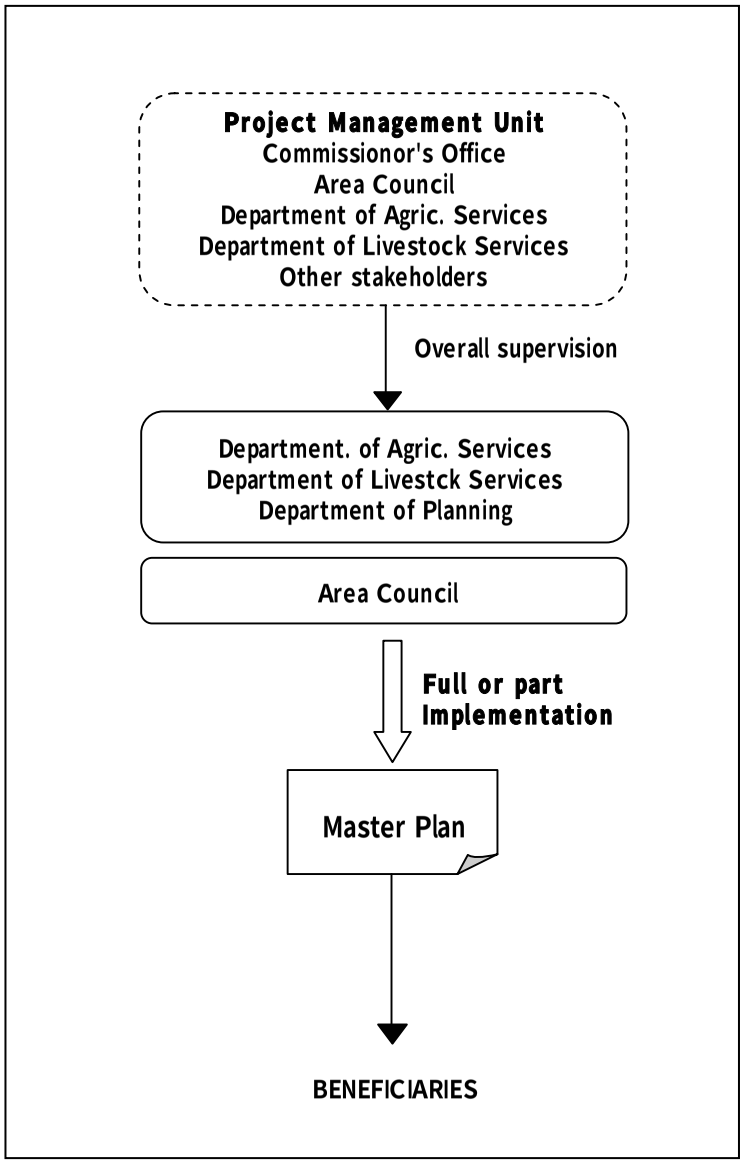
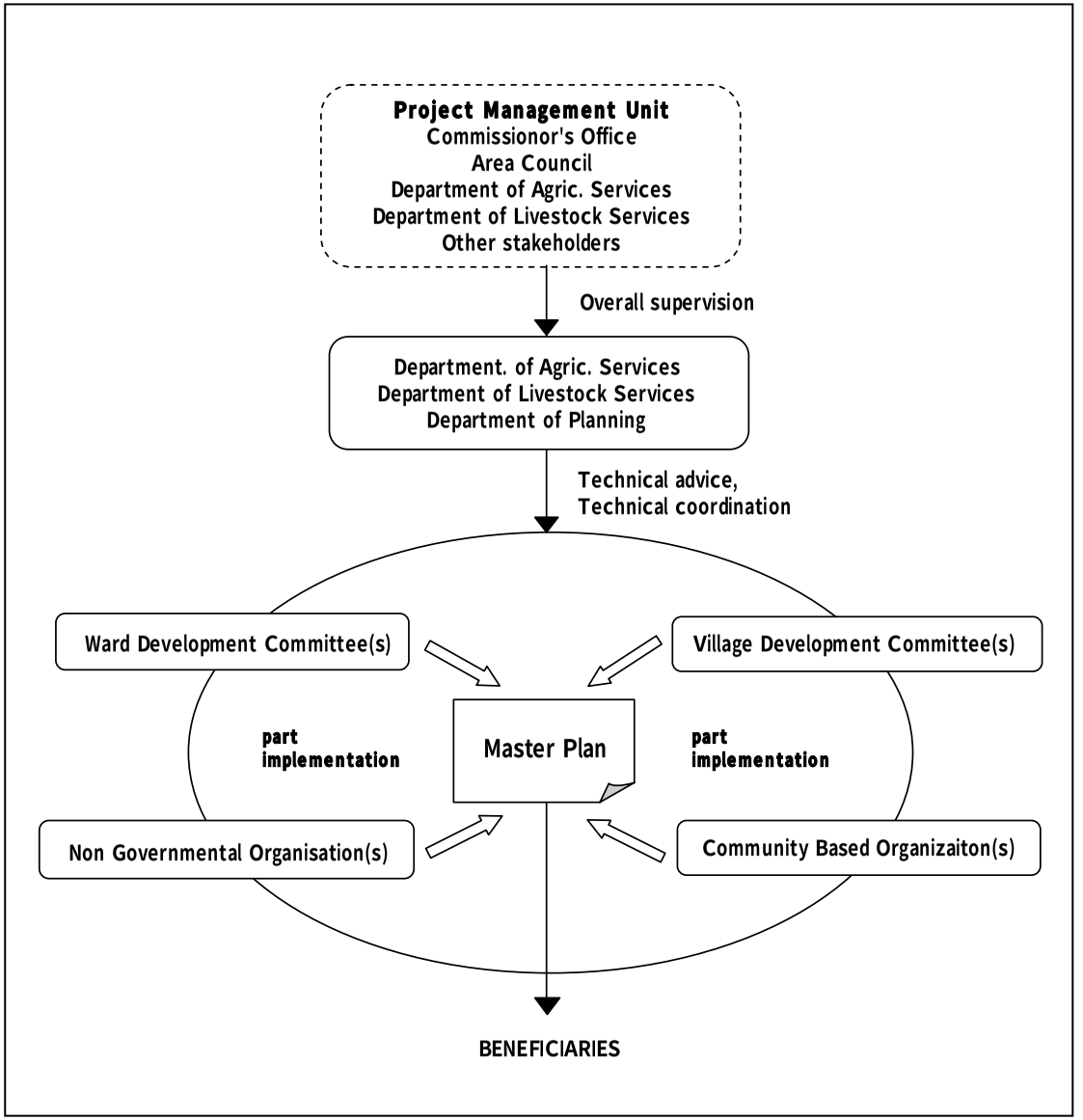


Figure 5.3 Implementation Plan of the Master Plan



Implementation Structure of the Master Plan



Implementation Structure at Ward and Village Level

Figure 5.4 Implementation Structure

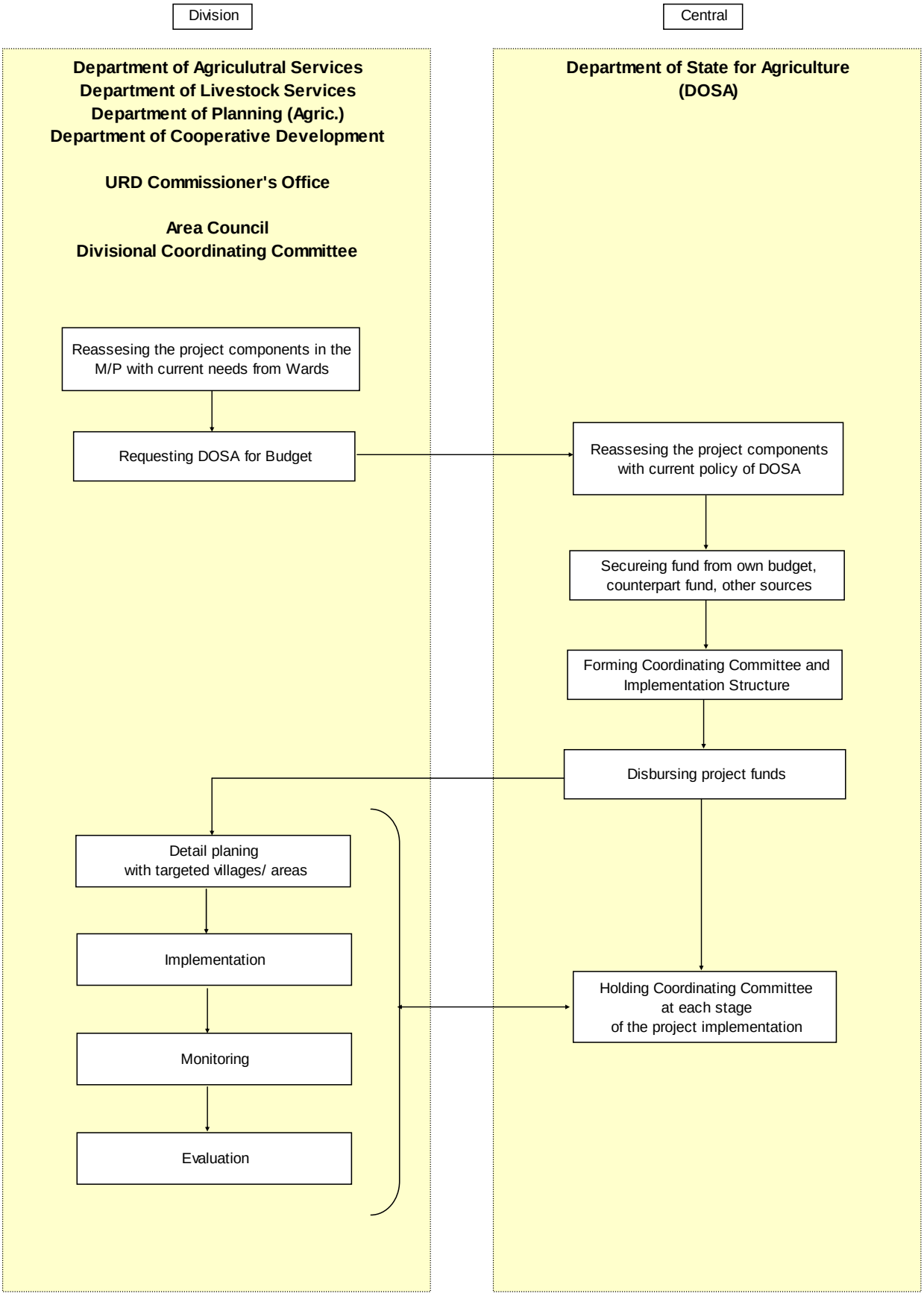


Figure 5.5 Procedure of Implementation (led by Central Government)

Community Initiative Projects (Project No. A-2,3,6,7,8,10, B-11,12,13, D-18,19))

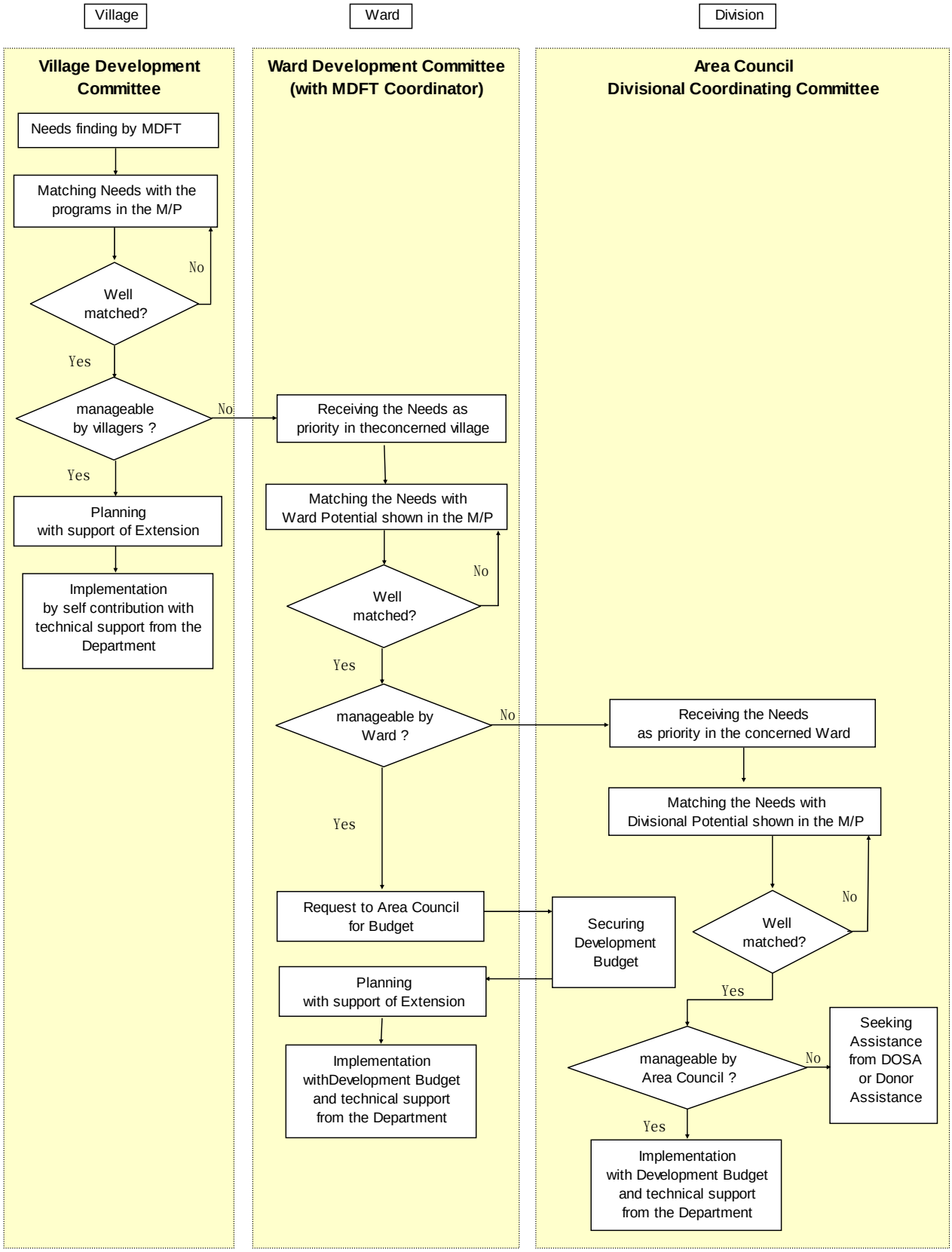


Figure 5.6 Procedure of Implementation at Local Level

		1	2	5	3	4	6	7	8	9	10	11	12	13	14	Selection criteria
	District	Sandou			Fulladou East						Wuli			Kantora		
	Ward	Diabugu	Missira	Sutu konding	Julangel	Gambi-sara	Basse	Sabi	Dampha kunda	Kulari	Sare Ngai	Baja Kunda	Foday Kunda	Garawol	Koina	
	Population	16,125	8,500	N/A	11,213	17,378	25,693	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Area (km2)	285	304	N/A	189	10.5	N/A	N/A	532	120	N/A	N/A	N/A	N/A	N/A	
	Number of villages	29	29	13	70	19	16	19	30	18	29	12	28	17	N/A	
	Ethnicity 1	Fula	Mandinka	Mandinka	Fula	Mandinka	Mandinka	Sarahulay	Sarahulay	Fula	Fula	Mandinka	Mandinka	Sarahulay	Fula	
	Ethnicity 2	Mandinka	Fula	Fula	Mandingos	Sarahlay	Fula	Fula	Fula	Mandinka	Sarahulay	Fula	Fula	Fula	Mandinka	
	Ethnicity 3	Sarahulay	Sarahulay	Sarahulay	Jahankas	Fula	Sarahulay	Mandinka	Mandinka	Aku	Mandinka	Sarahulay	Sarahulay	Mandinka	Sarahulay	
	District Extension Centre	Naudeh			Mk Kunda				Giroba		Jakunda	Sutokoba			Fatoto	
Community Initiative Project	A. Livelihoood Improvement Programme															
	3 Strengthening Rice Growers Association			A	A	A	A				A			A	A	Location of LADEP structure
	6 Compost Farming Project				A	A	A	A	A						A	Suitability to vegetable produciton and location of MFC
	7 Fodder Production around Households Project	A	A	A	A	A	A	A	A	A	A	A	A	A	A	ANR policy initiative
	9 Animal Tractino for Women	A	A	A	A											WDP needs assesment A>30%
	B. Improvement of Living Condition Programme															
	10 Small Scale Food Processing/Preservation				A	A	A	A	A					A	A	Ground water level
	11 Cereal Bank Management	A	A	A							A	A	A			ANR policy initiative
	12 Introduction of Labour Saving Devises for Women	A		A	A											WDP needs assesment A>50%
	D. Capacity Building Programme for Communities															
	18 Organization Management Skill Training	A	A	A	A	A	A	A	A	A	A	A	A	A	A	ANR policy initiative
	19 Entreqreneurial Skills Training	A	A	A	A	A	A	A	A	A	A	A	A	A	A	ANR policy initiative

A: Recommended project

WDP needs assessment: An analysis was made on the number of villages stating a particular needs in a Ward by reviewing Ward Development Plan.

A＞50%: More than 50 % of villages among all in ward states the said project as their priority.

Figure 5.7 Recommended projects for each ward

Table 5.3 Selection of Priority Projects

Project title / Criteria		① Contribution to livelihood	② Skill level of Dept.	③ Skill level of farmers	④ Required time to the goal	⑤ Scale of funding	TOTAL
A	Livelihood Improvement Programme						
1	Farming Practice Improvement Project	5	5	4	4	3	21
2	Seed Bank Project	5	3	3	4	3	18
3	Strengthening Rice Growers Association	4	4	2	4	4	18
4	Promotion of NERICA	5	4	3	4	4	20
5	Study on Pre and Post Harvest of Rice Production	4	3	2	3	4	16
6	Compost Farming Project	3	4	5	3	5	20
7	Fodder Production around Households Project	3	4	5	2	5	19
8	Improvement of small ruminant production	5	4	4	4	3	20
9	Animal Traction for Women	4	4	4	5	4	21
B	Improvement of Living Conditions Programme						
10	Small Scale Food Processing/Preservation	4	4	4	5	5	22
11	Cereal Bank Management	4	3	3	5	4	19
12	Introduction of Labour Saving Devices for Women	5	3	3	5	3	19
C	Technical Support Services Strengthening Programme						
13	Resource Mapping for Extension Workers	3	4	-	3	5	15
14	Training on Livestock Management and Disease Control	5	4	-	4	5	18
15	Coordination Skill Development at Divisional level	4	5	-	4	5	18
16	Agriculture and Marketing Database Project	5	5	-	4	5	19
17	Training and Promotion of Mixed Farming	4	3	-	3	5	15
D	Capacity Building Programme for Community						
18	Organisation Management Skill Training	3	4	4	3	5	19
19	Entrepreneurial Skill Training	3	4	4	3	5	19

Note:

Each project has 5 points against each criterion, totalling 25 points; except for C) Technical Support Service Strengthening Programme which were accorded only 20 points since the third criterion, Skill level of farmers, does not apply for the programme. The project components with more than 80 % marks were selected as priority projects among the nineteen projects. The selected priority projects are highlighted with shade.

Chapter 6 Verification Study

6.1 Draft Master Plan to Final Master Plan

6.1.1 Objectives of the Verification Projects

The objectives of the Verification Projects are;

1) to carry out technology transfer to Gambian counterpart personnel to enhance their capacity in the delivery of extension services to their areas; and,
2) to carry out technology transfer to local communities in the target area through the implementation of pilot projects.

These can be translated to the overall mission:

"To seek a model for an effective agricultural service system"

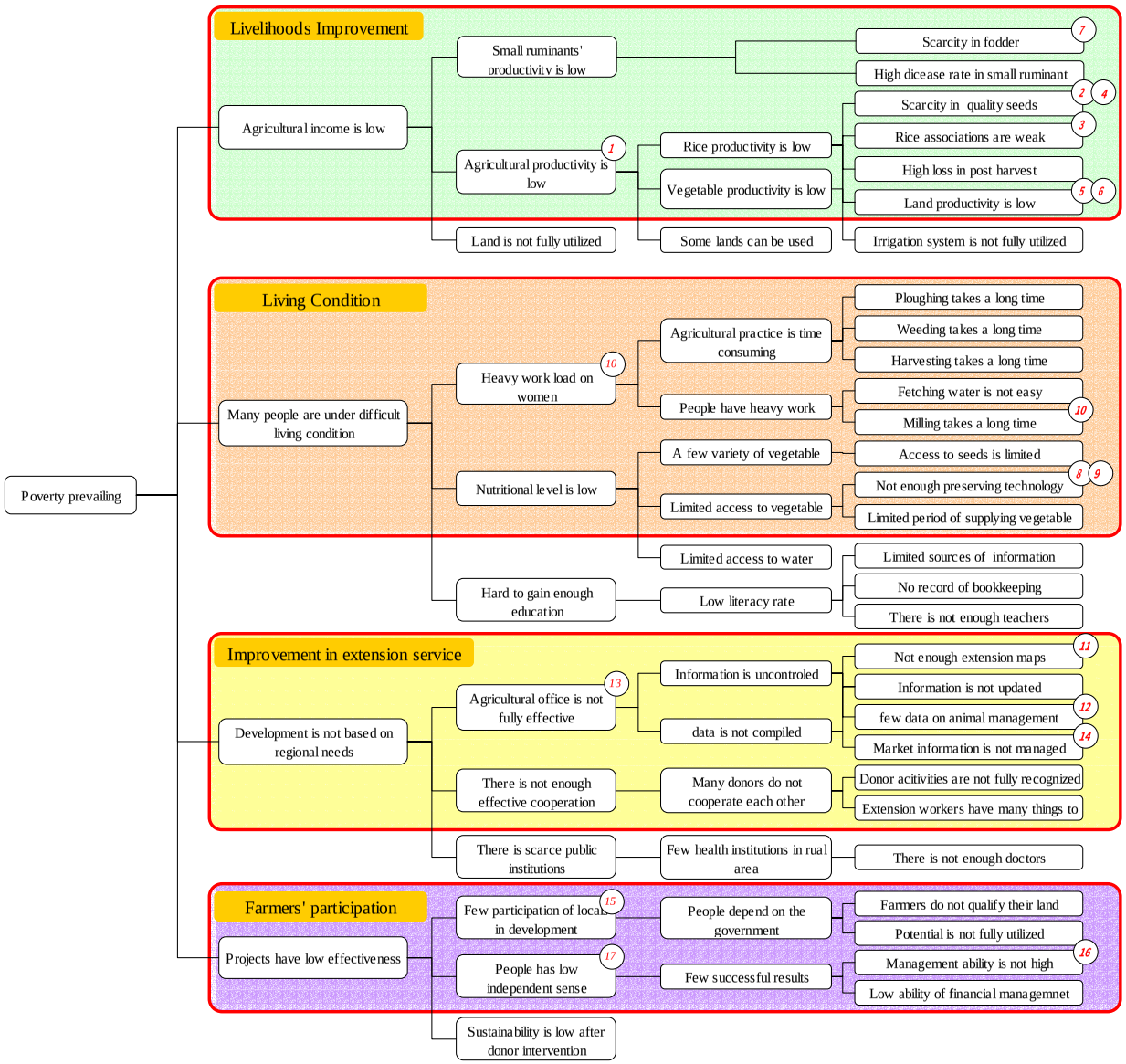
by which agricultural extension staff can work more efficiently to deliver services and farmers can obtain necessary inputs such as information and technical advices from available sources. This could complement the effort of other donors. By achieving this, a final target group of the Master Plan, the poor in URD, could maximise benefits from agricultural related projects contributing to rural livelihood improvement.

There is another more important objective for the Study's purpose. Since this Study is to implement some projects derived from the Provisional Master Plan as pilot, feeding back of results of the projects to the Provisional Master Plan has to be informatively made so as to finalise the formulation of the Master Plan. Hence, there is an objective of:

"obtaining necessary information for the programmes in the Master Plan"

6.1.2 Selection of the programmes

The selection of the programmes in the Master Plan was made following analysis of rural livelihood conditions in URD. The constraints and potentials elucidated from the preliminary examination of the five capitals in rural area are carefully reviewed in Chapter 4. The development components addressing the constraints and capitalising on the potential are identified through the problem and objective trees prepared in the PCM session with DAO staff. Among the development components, the Plan extracts the ones that are most promising and highly likely to be practiced with low cost and materials available in the area, and integrates ones aiming at similar objectives into programme. There are four programmes in which the extracted and integrated components are fitted, namely A) Livelihood Improvement, B) Improvement of Living Condition, C) Technical Support Service Strengthening, and D) Capacity Building for Communities. Figure 6.1 shows Draft Master Plan consisting of the development components identified from the problem tree.



A. Livelihoods Improvement Programme	1 Farming Practice Improvement Project
	2 Seed Storage Improvement Project
	3 Strengthening Rice Growers Association
	4 Promotion of NERICA
	5 Training and Promotion of Mixed Farming
	6 Compost Farming Project
	7 Fodder Production around Households Project
B. Improvement of Living Condition programme	8 Small Scale Food Processing/Preservation
	9 Cereal Bank Management
	10 Introduction of Labour Saving Devises for Women
C. Technical Support Service Strengthening Programme	11 Training on Resource Mapping for Extension
	12 Training of Livestock Management and Disease Control
	13 Agriculture and Marketing Database Project
	14 Coordination Skill Development at Divisional
D. Capacity Building Programme for Communities	15 Organization Management Skills Training
	16 Entrepreneurial Skills
	17 Sensitasation for Sustainable Livelihoods

Agricultural related problem tree built by the Study Team together with agricultural office workers

Project menu (Provisional MP)

Figure 6.1 Formulation of Draft Master Plan

6.1.3 Site Selection for Verification Project

In order to identify project sites for the implementation of the Verification projects, data from the Village Profile Surveys which were conducted at the beginning of the Study were used. Sixty villages were selected for the survey in consideration of population, ethnic makeup, number of households, family size, literacy levels, food habits etc., information pertaining to the number of development groups in the village, their affiliation to NGOs and CBOs, the existence of a VDC and whether or not the VDC was trained and a Community Action Plan was formulated.

Based on the information collected in the Profile Survey, 16 villages were selected considering their potential for agriculture and rural development in addition to the above-mentioned criteria. Then a detailed survey using a RRA method was conducted later in the 16 villages in order to grasp the present conditions of the villagers and possible activities for the verification project to be implemented. This was done taking into consideration of both potentials and constraints towards sustainable development. These villages are to be as closer as possible to any of the 5 MFCs which are spread out in the division, in order to ensure a close working relationship between the said villages and the farming centres.

Finally, the following five villages are selected; Kossemar Tenda and Touba Tafsir from Fulladu East district; Jaka Madina from Sandu; Jah Kunda from Wuli and Fatoto from Kantora, shown in the following table.

Table 6.1 Selected Villages for Verification Project

District	MFC (DEC)	Village	Basic Information of Village
Fulladu East	Mankamang Kunda	**Kossemar Tenda**	【Population】470 【Ethnic】Mandinka, Fula 【CAP】 1st CAP formulated at Jun.2001 【Access】3km from main road 【Remarks】A weekly market is located in this village.
	Giroba Kunda	**Touba Tafsir**	【Population】1,000 【Ethnic】Mandinka, Fula 【CAP】 1st CAP formulated at May 1999 【Access】7km from main road 【Remarks】Communal activities led by Cohesive VDC are seen.
Sandu	Naudeh	**Jaka Madina**	【Population】200 【Ethnic】Mandinka, Fula 【CAP】 1st CAP formulated at May 2001 【Access】4km from main road 【Remarks】This is a small but very cohesive community.
Wuli	Jah Kunda	**Jah Kunda**	【Population】920 【Ethnic】Mandinka 【CAP】 1st CAP formulated at Apr. 1999 【Access】0km from main road 【Remarks】MFC and an active CBO's office are located.

District	MFC (DEC)	Village	Basic Information of Village
Kantora	Fatoto	**Fatoto**	【Population】 1,300 【Ethnic】 Fula, Mandinka 【CAP】 1st CAP formulated at Dec. 2000 【Access】 0km from main road 【Remarks】 MFC and a permanent market are located.

Presence of a cohesive VDC, a MFC and a market structure is regarded to be the biggest potential for further development of the above villages. These could be the vehicles of the villages' development. However, agriculture remains the most important among their ways of living, being the core activities in the villages, like other villages in The Gambia. Therefore, agricultural related activities practiced in the villages are thoroughly surveyed. In addition, crop preference ranking was also carried out in order to grasp the agricultural characteristics specific to the villages. The result of the ranking and the reason for the preference are summarized as follows.

Table 6.2 Crop Preference Ranking in the Five Villages

Village		Ranking				
		1	2	3	4	5
Kossemar Tenda	Male	Rice	Groundnut	Sorghum	Millet	Maize
	Female	Rice	Groundnut	Vegetable	Sesame	
Touba Tafsir	Male	Food Grains	Groundnut	Watermelon	Cassava	Fruit
	Female	Groundnut	Vegetable	Rice	Sesame	
Jaka Madina	Male	Sorghum	Groundnut	Millet	Maize	
	Female	Rice	Groundnut	Sorghum	Vegetable	Millet
Jah Kunda	Male	Groundnut	Sorghum	Maize	Millet	Findo
	Female	Groundnut	Findo	Sesame	Cocoyam	beans
Fatoto	Male	Sorghum	Groundnut	Millet	Rice	Maize
	Female	Groundnut	Rice	Vegetable	Cereals	

Table 6.3 Reasons of Preference on Crop

Crops	Reason for Choice
Sorghum	Food crop, Easy to process, Animal feed, Fencing materials, Adaptability to low soil fertility
Groundnuts	Cash crop, Food crop, Animal feed (also can be sold), Various dishes
Rice	Staple diet, Easy to cook, Animal feed, Easy to store, Straw for mattress fillings
Vegetable	Cash crop, Food crop, Cultivated during dry season
Millet/Maize	Food crop, Cash crop (but only when desperate for cash)
Fruit	Cash crop, Food crop, Easy market

There are another two sites to be included in the Verification Project, which are Giroba Kunda and Mansajang Kunda. The former is the village where Giroba Kunda MFC is located. The MFC is the nearest farming centre to the capital of URD, Basse Santa Su. In this Verification, NERICA variety, a strategically disseminated variety in the West Africa, is introduced to

examine its suitability to the area. In order to maximize effects of its demonstration to as many people as possible, the MFC and its village are selected. The village, in fact, has a big potential for expansion of rice cultivation both in volume and land size. It is adjacent to the river and the project called LADEP funded by ADB and IFAD has been intervening for several years surveying the potential of the land, constructing small dykes and spillways and providing technical backstopping for rice cultivation.

The latter, Mansajang Kunda bordering the divisional capital, Basse Santa Su, is conveniently located for vegetable production as peri-urban area. Since this Verification includes a vegetable production and processing project as explained later, such peri-urban area is identified for making a contrast with the other selected target areas. It is important for the target areas to know what the peri-urban area does and what the difference is. This Verification offers the opportunity for the farmers to visit the other sites and see their development. It is expected that they, at such meeting, discuss problems they face and exchange their technical knowledge.

6.1.4 Selected projects for Verification

There are two categories of the Verification projects;

(1) Technical Support Project; and,

(2) Community Based Project.

The selection of the former type of project was led by the Study Team and counterparts in consideration of the national agricultural policy and its regional context. The selection of the latter was based on the needs of people in the target villages. Also considering the period of 2 years allocated for the Verification Projects, projects which could bear fruit on the rural life or give important information to the Master Plan were carefully identified.

For the purpose of selecting community based projects, a meeting was held on 13th August with the attendance of the DAC, 4 SMSs, 1 DES, 5 VEWs, 2 volunteer workers and 3 of the Study Team members. At the meeting, through assessment of the needs of the targeted village, 3 projects were tentatively proposed: Farming Practice Improvement; Mixed Farming Promotion; and, Small Scale Food Processing/Preservation. Then finally, 6 projects were selected by adding another 3 projects which are geared towards experimentation and capacity building: NERICA trial, Promotion of Coordination Work and Sensitisation for Project Sustainability. The table below shows these 6 projects for the Verification and their relationship with the Master Plan.

Table 6.4 Selected Verification Projects and their relation to the Master Plan

Provisional Master Plan		Verification Components
A. Livelihood Improvement Programme		
1. Farming Practice Improvement Project	→	(1) Farming Practice Improvement Project
2. Seed Storage Improvement Project		
3. Strengthening Rice Growers Association		
4. Promotion of NERICA	→	(2) Promotion of NERICA
5. Training and Promotion of Mixed Farming	→	(3) Training and Promotion of Mixed Farming
6. Compost Farming Project		
7. Fodder Production around Households Project		
B. Improvement of Living Condition Programme		
8. Small Scale Food Processing/Preservation	→	(4) Small Scale Food Processing/Preservation
9. Cereal Bank Management		
10. Introduction of Labour Saving Devises for Women		
C. Technical Support Service Strengthen Programme		
11. Training on Resource Mapping for Extension Workers		
12. Training of Livestock Management and Disease Control		
13. Agriculture and Marketing Database Project		
14. Coordination Skill Development at Divisional Level		(5) Coordination Skill Development at Divisional Level
D. Capacity Building Programme of Community		
15. Organization Management Skills Training		
16. Entrepreneurial Skills Training		
17. Sensitasation for Sustainable Livelihoods	→	(6) Sensitasation for Sustainable Livelihoods

6.1.5 Coordination of the Selected Projects

Each of the 6 projects selected has its own targets and expected impacts on rural life in the study area. It is however, also assumed that coordinating them and arranging them into a package could give much bigger impact to the targeted villages. Therefore, instead of introducing one by one, this verification suggests to implement several projects in a village. With careful consideration to sequencing of activities from production to post-harvest, 4 packages including the 6 projects are finally proposed in order to exploit positive interaction between the projects. This arrangement makes project implementation much smoother, more efficiently and gives more information about production cycles within the short period. The table below shows the proposed package projects and their components.

Table 6.5 Proposed Package Projects and their Components

Package Projects	Individual Projects
(1) Groundnut Production Improvement	(1) Farming Practice Improvement (3) Training and Promotion of Mixed Farming (4) Small Scale Food Processing/Preservation (6) Sensitisation of Project Sustainability
(2) Vegetable Production and Food Processing	(1) Farming Practice Improvement (3) Training and Promotion of Mixed Farming (4) Small Scale Food Processing/Preservation (6) Sensitisation for Project Sustainability
(3) NERICA Trial and Extension Planning	(2) Promotion of NERICA (6) Sensitisation of Project Sustainability
(4) Coordination Skill Development	(5) Promotion for Coordination Work

A description of the 4 package projects and the process of the Verification Study are shown at the end of this chapter. The final arrangement of the projects and the villages made considering crop preference and agricultural characteristics of each village is summarised in the following table.

Table 6.6 Verification Package Projects in the target villages

	Village	(1) Groundnut Production Improvement	(2) Vegetable Production /Processing	(3) NERICA Trial and Extension Planning	(4) Coordination Skill Development
South bank	Giroba Kunda			○	-
	Sotoma Samba			○	
	Mansajang Kunda		○		
	Touba Tafsir		○		
	Kossemar Tenada		○		
	Fatoto		○		
North bank	Jaka Madina	○			
	Jah Kunda	○			

6.1.6 Supplementary survey, Confirmation workshop and Baseline survey

Before the implementation of the V/P, the JICA Study Team carried out the following planned activities:

1) Supplementary survey：

   The Study Team carried out the survey on improved technologies related to the project components, in and outside the project area and investigated useful technologies and associated problems. This survey also capitalized on the interchange of experience among technical personnel at the site and the research institution, comprising NARI, as well as farmers' groups.

2) Confirmation workshop：

   The implementation plan shall be reviewed in a village workshop and be finalized in a participatory manner.

3) Baseline survey：

   A baseline survey was conducted to finalize the plan by analyzing its result and to establish a bench-mark for eventual evaluation of project impact. The targeted groups for the survey comprised of the farmer groups selected in each project site.

The confirmation workshops were held to elaborate on the preliminary working plans for community-based projects. This process is expected to build beneficiary sense of ownership of the project. Thus, participatory planning in community-based projects has been incorporated as

an important activity for the Verification Projects. In order to confirm the target villager's willingness to participate in the projects and their perceptions, two-day workshops were conducted in each site from 17th November to 25th November 2003.

The baseline survey was conducted by DAS and the JICA Study Team with hired local consultants. The baseline survey on the proposed 2 sites for groundnut project using purposively selected sample of 30 participants were done at Jaka Madina and Jah Kunda, and 4 sites for vegetable production with 25 participants at Kossemar, Fatoto, Mansajang Kunda and 28 participants at Touba Tafsir. The purpose of the baseline survey on the groundnut project was to reveal the present condition of women in groundnut cultivation, such as decision making on cultivation, farm size, and access to farm implements and so on. On the other hand, the purpose of the baseline survey on the vegetable project was to determine the approach (individual versus group), type of vegetables grown and whether they are consumed raw or cooked. The survey also investigated average plot sizes, the processing experience etc of the respondents.

Monitoring and evaluation system is an effective management tool to check and understand the outputs and constraints on a regular basis. This tool will make a great contribution to improving the operation and management of on going projects and future master plans.

One of the most important objectives of the study is to reflect the lessons learned (points which the farmers and the executing agency feel should be improved in future project implementation) from the results of the verification projects in the master plan. Therefore, the verification projects have two characteristics. From the farmers' point of view, they are projects, even though they are for verification purposes, while for the study team they are projects which take "verification" (lessons learnt) as their theme. The study, aims to fill up the perception gap, promote the strategy of emphasizing village workshops and participatory M&E, led by the farmers and by extension workers who are intimately familiar with the villages, in order to place project management on the Gambian side as far as possible.

The verification projects are implemented in small numbers and in limited time, and hence the degree to which they can be reflected in the master plan is limited. The hypotheses were set in advance based on analysis of the situation within the study and the results of similar projects to resolve the constraints. The monitoring and evaluation basically carried out under the study will follow those hypotheses.

6.1.7 Lessons from the Verification Projects

Through implementation and Monitoring and Evaluation of the four verification projects, together with discussion at the Coordinating Committee and the result of supplementary surveys, the Master Plan was finalised. The final Master Plan accommodated three more project components while deleting one. The newly accommodated ones are “Study on Pre- and Post-Harvest of Rice Production”, “Improvement of Small Ruminant Production” and “Animal Traction for Women”. The one deleted is “Sensitization for Sustainable Development”. “Study on Pre- and Post- Harvest of Rice Production” was added since in the Verification Study on NERICA, the review of the rice sector as a whole including flow of activities from rice cultivation, harvest until post-harvest had been recognised as an urgent task. This study could be complementary to the current endeavour of the Government concentrating on seed multiplication of NERICA. Despite the high demand on efficient and effective small ruminant production in URD, the Draft Master Plan did not address the issue directly; and therefore, “Improvement of Small Ruminant Production” was identified and strongly suggested from the members of the Coordinating Committee to be included in the Final Master Plan. “Animal Traction for Women” was included given the fact that the effect of training on animal traction to women clearly appeared positive, even if it stands alone. Another change was made on “Promotion of Mixed Farming”. It was formerly categorised into Programme A “Improvement of Household Income” but finally converted into Programme C “Technical Support Service Strengthening” by realising that training be given more to extension staff before extending to farmers. In general, extension staff are equipped with the knowledge of general agriculture, especially cereal and vegetable production. However, as extension agents at the front line, they are recommended to obtain a broader knowledge such as fruit tree production and livestock, even it is basic to respond to farmers’ wide ranging of needs. The deleted one “Sensitization for Sustainable Development” was not actually erased from the Master Plan, but incorporated into all other components since it has to be conducted whatever is implemented.

The flow of the formulation of the Master Plan, from Draft to Final, is presented in Figure 6.2

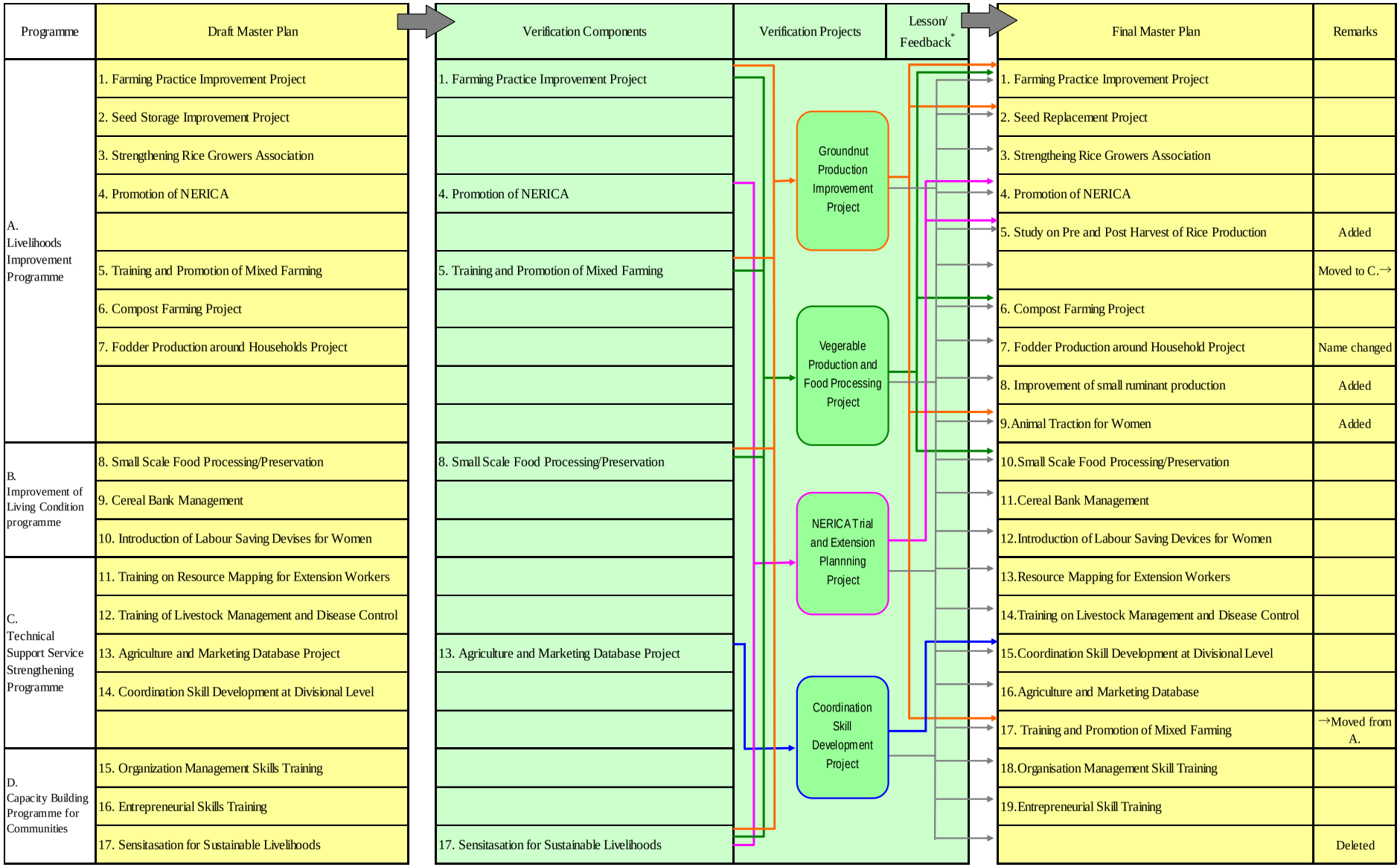


Figure 6.2 Flow from formulation of Draft, Verification Projects to Final Master Plan

6.2 Evaluation of Verification Projects

6.2.1 Groundnut Production Improvement Project

In URD, more women are engaged in groundnut production than in other divisions of the country. Groundnut is an important produce for women. However, operations on women's fields are left until men complete theirs, a critical constraint as farming operations have to be conducted in a timely manner under rainfed conditions. In order for women to manage farming better in a timely manner, training in animal traction shall be given to their groups. The verification project for groundnut has been conducted in two (2) selected villages in URD to verify the dissemination of the improved technologies such as animal traction in order to reduce intensive manual labour at sowing and weeding and to promote timely agronomic practices among women. Groundnut is cultivated as the main cash crop in the selected villages of Jaka Madina and Jah Kunda.

Table 6.7 Summary of Inputs

Site	Village	Target	
	Jah Kunda	1 group, 30 members (26 women and 4 men), Total area 1.0 ha	
	Jaka Madina	1 group, 30 members (27 women and 3 men), Total area 1.0 ha	
Schedule	1) preparation：Nov. 2003～Mar. 2004 2) implementation：May. 2004～Nov. 2005		
Personnel	**The Gambian side** Farmers DAS extension workers DAS - DAC, ADAC, SMSs DLS - DLO		**JICA side** The Study team
Input	**The Gambian side** **Farmers** - Cutluss - Rake - Axe - Handhoe - Jutebag **DAS/DLS** - Fuel and Gasoil for monitoring		**JICA side** 1. Sinehoe ・Plough ・Lifter 2. Seeder 3. Draught power animal 4. Seed dressing chemical 5. Fertilizer 7. Seeds 8. Fungicide 9. Donkey cart - Fuel and Gasoil for monitoring

Villagers' contribution	Villagers contributed for 5 % of invested equipments and materials on the project cost (1 to 9 in the above), the condition of which was decided referring to the condition of other donors. This share of cost was kept in the JICA team's bank account with the intention to be later returned to their bank account for their project sustainability.

6.2.1.1 Activities

Table 2.1.1 illustrates the work schedule of the groundnut project. Except for the periodical technical supervision provided through extension workers, all the activities have been completed.

Table 6.8 Work Schedule of the Groundnut Project

		2003			2004								
Activity	person in charge	10	11	12	1	2	3	4	5	6	7	8	9
Preparation of schedule	DAS and The Team												
Sensitisation workshop	DAS												
Identifing NGO	The Team												
Modification of schedule	DAS and The Team												
Purchasing items	AFET(NGO)												
Training on Animal draft	DAS and The Team												
Seed selection	DAS												
Sowing	DAS												
Cultivation	DAS												
Harvesting	DAS												

		2004			2005								
Activity	person in charge	10	11	12	1	2	3	4	5	6	7	8	9
Cultivation	DAS												
Harvesting	DAS												
Seed storage	DAS												
Seed Selection	DAS												
Sowing	DAS												
Cultivation	DAS												
Participatory Evaluation	DAS and The Team												

a) Activities by Farmers

The activities carried out from the commencement of the project are summarised as follows.

The project provided production inputs (seeds, fertilizer), implements (seeders and sine hoes), draught animals (donkeys) and several skill training for the beneficiaries.

The trainings conducted during the project period included:

1) Seed selection (2 days, middle of May, 2004)

   Through the extension staff for all members and at both sites

2) Animal Traction (8 days, end of May, 2004)

   This included introduction of farm implements, ploughing training, maintenance of the

implements and carrying out recommended agronomic practices.

3) Field day (1 day, end of September, 2004)

Twenty one (21) farmers, 10 male and 11 female, were invited to study the situation at the impressive Jaka Madina field.

4) Harvesting (2 days, end of October)

Just before the harvest season, trainings were conducted at both the sites using farm implements with an attachment lifter.

Participants for the trainings are summarised below.

Table 6.9 No. of participants for each training

	Seed selection	Intro. of Implements	Harvesting
Jaka Madina	30	30	18
Jah Kunda	30	28	25
Total	60	58	43

b) Activities by Counterpart

The implementation of this project was spear headed by the SMS Soil Conservation based at the office in Basse and two extension staffs at Jah Kunda and Jaka Madina respectively. Animal Traction Instructors also supported the training activities under the project. During events such as Site Tours by the Minister (Secretary of State) and Farmer's Field Day, other office staff including the Divisional Agricultural Coordinator also participated and committed their valuable time and expertise. The latter have also been playing an important role in the monitoring of various aspects of this project with the support of the Monitoring Supervisor attached to the project. The roles of staff involved are dilated below.

a. Conducting regular monitoring (SMS: bi-monthly, Extension staff: when necessary)
b. Preparing Monitoring Sheets (Extension staff)
c. Participating in several workshops (SMS, Extension staff)
d. Conducting Training of Trainers (SMS, Animal Traction Instructor)
e. Supervising Training (SMS), Conducting Training (Animal Traction Instructor)
f. Submitting a brief monitoring report (SMS: monthly, Extension staff: bi-monthly)
g. Providing technical advice (SMS, Extension staff, Animal Traction Instructor)
h. Coordinating groundnut production activities by farmers

6.2.1.2 Output

a) Benefit of the Verification Project

The number of direct beneficiaries comprised of 60 farmers at 2 sites, Jaka Madina and Jah

Kunda. The surrounding villagers can be regarded as indirect beneficiaries, especially those who visited Jaka Madina for the Field Days. The area of the project site is 1 ha at each village, although an additional 0.5 ha at Jaka Madina and 4 ha at Jah Kunda were undertaken on members' own initiative. Indirectly, the women members' individual farms benefited by using implements provided by the project in the area of 13.1 ha for Jaka Madina and 21 ha for Jah Kunda in total.

The amount of produce and sales are summarised in the table shown below. With intensive supervision by the extension staff, both villages achieved very high yield, which is 30% and 60% more than average in the division.

Table 6.10 Project field of 1ha (under extension staff' supervision)

	Yield	Kg sold	Sales
Jaka Madina (1ha)	1,288 kg	896 kg	D 6,680.00
Jah Kunda (1 ha)	1,650 kg	1,057 kg	D 8,561.70
URD average	1,000 kg	-	-

Given the above, the sales achieved at the project field, even if could be shared by the members; can be regarded as increase of income for both villages. Additionally, at Jaka Madina, the impact of the project could be observed in the individual fields too. On average, members' field sizes, and consequently amount of produce, showed a 50 % increase, which somehow boosted their income. On the other hand, suffering from scarcity of seeds and unfavourable seed quality, the members even reduced the size of their individual fields in Jah Kunda.

The objective of the project not only focused on improved production at the 1 ha project site, but also investigating the impact of improved access by women farmers to farm implements by observing any changes in their individual farms.

Table 6.11 Change in several indicators of the project farmers on average

	Jaka Madina		
	03/04 season (before project)	04/05 season (project 1st year)	05/06 season (project 2nd year)
Hectare	0.31	0.47	0.77
Output	204.7 kg	338.7 kg	-
Yield per ha	649.1 kg	720.2 kg	-
	Jah Kunda		
	03/04 season (before project)	04/05 season (project 1st year)	05/06 season (project 2nd year)
Hectare	0.79	0.72	0.78
Output	630.7 kg	533.8 kg	-
Yield per ha	796.7 kg	744.8 kg	-

*No. of respondents; 21 women for Jaka Madina, 15 women for Jah Kunda

At Jaka Madina, there were big increases in land size and amount of produce, which was due to introduction of the farm implements, although it was not reflected in terms of increased yields. On the other hand, as stated earlier, at Jah Kunda, the members complained about quality of the implements brought to them. Consequently, they worked on the individual plot in the way they did last year, which is to use the hand hoe. In addition, farmers at Jah Kunda basically suffered from scarcity of good seednuts. To verify that the increase is an actual impact of the project, observation was made in this season on the same 21 women in Jaka Madina and 15 women in Jah Kunda. The result was again positive, with 63% increase against the previous season, approaching to 0.77 ha on average in Jaka Madina, whereas the size of Jah Kunda on average remained almost the same as that of last season, 0.78 ha. Although the observations have been made from two seasons, it could be inferred that a woman with less than 0.5 ha land cultivated could expand her land size with the availability of farm implements as far as the other conditions allowed her to do so.

b) Contribution to Capacity Building of Counterpart Personnel

Among the above, monitoring report writing and TOT have provided them additional knowledge and management skills which are of necessity in project implementation and coordination. Review of their reports indicates improvement in its quality. This has strengthened not only their monitoring activities on this particular project but also their routine activities. TOT provided an opportunity where five Animal Traction Instructors acquired new teaching methods and made themselves more easily understood by farmers.

Financial Analysis

To obtain the financial status of the individuals having access to the farm implements, the assumptions below are set based on the data collected through the verification project.

Table 6.12 Assumptions for Financial Analyses

>Without Animal Traction	>Other conditions
1) An average size of 0.5 ha is cultivated. 2) Yield is 0.7 t/ha from women's plot. 3) Fertiliser is not applied.	a) The same size of field is to be cultivated for the next season. b) Seeds required for the next season are kept from own harvest (*Required amount of undecorticated seeds for 1 ha is 140 kg) c) For home consumption, 2 bags (approx.100kg) are to be kept. d) The buying price per kg by cooperative is 8.1 dalasis. e) The cost of fertiliser is 340 dalasis per bag of 50 kg.
>With Animal Traction and fertiliser	
1) Increase in the size of cultivated land by 50 % is achieved by introducing animal traction. 2) Productivity improve by 20% due to timely agronomic practices, proper weed management and fertiliser application. 3) Fertiliser is applied with half of minimum requirement.	

Table 6.13 Comparison of net revenue with and without animal traction
(without consideration of the investment cost on the traction set)

	without	with
Size (ha)	0.5	0.75
Yield (kg)	600	720
Output (kg)	300	540
Home consumption (kg)	100	100
Seeds for next year (kg)	70	105
Amount sold (kg)	130	335
Price per kg (dalasi)	8.1	8.1
Sales (dalasi)	1053	2713.5
Fertiliser (bag)	0	0.75
Cost of fertiliser (dalasi)	0	255
Profit (dalasi)	1053	2,458.5

6.2.1.3 Evaluation of Groundnut Production Improvement

a) Verification of hypothesis on agricultural technology

Three hypotheses were set for this groundnut verification project in order to draw important information from the project before finalising the formulation of the Master Plan. The results of verification of each hypothesis, and the lessons learnt which should be fed back to the Plan, are mentioned below.

Hypothesis 1: Small ruminants are more easily accepted by women for a traction purpose both socially and physically.

This was proved throughout the project period, since a donkey is tamer and easier to control compared to other animals used for traction, such as oxen and horses. Depending on soil conditions, it is harder for a donkey to pull the implement especially in lifting groundnuts.

Hypothesis 2: Timely operations could give farmers higher labour productivity and better yields.

It was observed that members obtained more than 1.2 ton from the project site of 1ha. This was attributed to timely agronomic practices but response to yield seems to depend more on rainfall pattern and use of fertiliser, since it reflects on the weight of each groundnut pod.

Hypothesis 3: The introduction of animal traction implements could reduce women's drudgery in their field.

Expansion of land cultivated could be due to the fact that they found it much

easier to undertake ploughing and weeding by using the implements. They utilized the implements to save time and expand the farm sizes of their groundnut fields. Therefore, the time they spent on their farm is similar to that of the last year. However, given that they earned more groundnuts, the impact of the implements can be regarded as positive. If other non-farm income generating activities such as petty trading, tie and dye, soap making etc can be introduced, there is greater possibility to diversify sources of income which could result in better welfare at household level.

b) Feedback to the Master Plan

Apart from the hypotheses, in the course of the project, periodical monitoring and observations were made in order to find lessons for revising the tentative plan. Considering the characteristics of this project, lessons have been sought from three points of view: agricultural technologies, extension approach and implementation structure. The lessons learnt from the project and possible feedbacks to the plan are together summarised below.

Table 6.14 Feedback to the Master Plan from Groundnut Verification Project

Feedback Points	Lesson learnt from the project	Ways to feedback to the M/P () refers to the projects in the M/P
Agricultural Technology	• Careful and intensive seed screening before sowing should be carried out by sensitising farmers continuously.	⇒ At least, one day training by extension staff before seeding and selling produce is to be conducted. **(A-2, A-9)**
	• Donkey is tamer but does not have enough power to lift groundnuts at harvesting when soil gets harder.	⇒ Oxen is another option for draught power, but the project should stick to using donkeys, considering women's ability in handling animals and their tolerance to disease. **(A-9)**
	• Without using farm inputs such as fertiliser, use of animal traction may not achieve significant production increase.	⇒ In addition to appropriate fertiliser use, improvement of soil fertility is to be promoted through tethering. **(A-1, A-9)**
Extension approach	• If projects provide farm implements for farmers, quality of farm implements matters in terms of farmers' motivation and sustainability of project.	⇒ Involvement of farmers in selecting farm implements has to be more encouraged. **(All the projects involving procurement)**
	• Less availability of quality implements and their attachments in the division caused problems for both timely introduction of the project and proper maintenance in the course of the project.	⇒ Extension staff have to take a role in being intermediaries between farmers and outsiders, such as factories, spare part dealers and blacksmiths, by accessing information prepared by the office level. **(C-16, C-17)**
	• Farmers attending the Field Day and being exposed to the impact of newly introduced technique has been highly motivated.	⇒ Expansion of the target areas is to be done from the verification sites to their neighbouring villages. Facilitation to the motivated farmer to access micro finance

Feedback Points	Lesson learnt from the project	Ways to feedback to the M/P () refers to the projects in the M/P
		for starting up is to be carried out. **(All projects)**
	• The project gave less impact on the villages where there are some other alternatives to minimise hardship such as access to casual labour or family owned implements.	⇒ To maximise impact of the project, target villages are to be selected from ones at remote area and with less population. These villagers should be invited for attending the Field day. **(A-9)**
Improvement of livelihood	• Women farmers with smaller land less than 0.5 ha have a possibility to expand their land size up to 0.7 ha with the project. • On the other hand, women with more than 0.7 ha may be difficult to achieve additional land expansion with the introduction of animal traction. • As long as the training on animal traction is conducted just before using it on farm, even for only one season it gives positive impact on production.	⇒ Targeting smaller size farmers could give better cost benefit ratio, and also contribute more to poverty mitigation. **(A-9)** ⇒ Priority should be given to the villages where there is no other alternative to reduce hardship of agricultural practice. **(A-9)** ⇒ A training to women on agricultural techniques and follow up by extension workers are to be more encouraged. **(All projects)**
Implementation structure	• NGOs have problems of scarcity of capable staff. They normally contract out to governmental departments when it comes to the technical aspects. • Only a few NGOs have their branch offices in URD, and such branch offices normally face problems of personnel and infrastructure. • There are few interchanges of information between the NGOs /CBOs and Extension workers. • Ability in project management including reporting of progress to the central government or to funding organisations, financial arrangement etc. has been strengthened, but not yet reached a satisfactory level.	⇒ More participation of the extension workers in the projects is to be promoted whereas involvement of the NGO is reduced. **(All projects)** ⇒ If they are to be involved, those with active local branch are to be selected as partners. **(Programme B and C)** ⇒ This is to be incorporated into the program of coordination skill development and continue to be fully promoted. **(Programme A and B)** ⇒ One of the most efficient approaches could be that the Divisional Agricultural Office implements projects. Considering extension workers available and also their expertise, at least, a few staff concentrating on a project should be appointed from the central government. **(All projects)**

6.2.1.4 Consideration and Suggestion for Future Activities

This groundnut production improvement project was implemented during the last two seasons -04/05 and 05/06 seasons. As mentioned earlier, there is significant difference between the two targeted villages in terms of the effects of the project appraised. This part describes considerations and suggestions for project sustainability in the two targeted villages as well as

the replicability of the project to other villages in URD.

Analysis on the two villages concerning groundnut production

Before the project started in May 2004, the study team assessed the status of groundnut cultivation in the two villages, Jaka Madina and Jah Kunda, with the DAS officers, based on analysis of the earlier conducted baseline survey. The results are tabulated below. Four parameters: experience in groundnut cultivation, size of individual women's holding, situation of newer cash crop women cultivate and degree of use of farm implements and tractor service were examined. Other than these, differences in characteristics due to ethnicity between Fula in Jaka Madina and Mandinka in Jah Kunda, was also observed.

Table 6.15 Status of Groundnut Cultivation

Items / Village	Experience	Size of holding	Other crop introduced	Use of impolements and tractor services
Jaka Madina	Good	Small	Sesame, cotton	Almost none
Jah Kunda	Good	Fair	Fonio	Fair

The following points should be noted in connection with the above assessment:

1) Experiences in groundnut cultivation are siginificant in both.
2) In Jaka Madina village, average farm size is small at about 0.3 ha, whereas it is 0.7 ha in Jah Kunda village.
3) There are several crops which have been newly introduced by development partners such as NGO/CBOs, but groundnut is still the dominant cash crop among women in the area.
4) Located along the main road of the division, Jah Kunda is relatively big in size, accommodating one of the five Divisional Extension Centres and the Office of WASDA. With proximity to one of the biggest lumos in the division, Sare Ngai lumo is next to the village.

In the course of the project implementation, there appeared several evidences highlighting other differences between the two villages. These include distances from farmers' residence to their field, and also distances between the members' field. In Jah Kunda, generally they have to walk long distance before reaching their fields from their compounds. This was pointed out at the earlier stage of the implementation by the staff of DAS. In response to that, the project attempted the measure that the farm implements and draught animal should be shared between members from the same Kabilo. However, there remained a handicap compared to Jaka Madina, in terms of easiness of sharing the implements among members. On the other hand, the project

members' fields are scattered and within 15 minute walk from their compounds.

Regarding the status of use of the implements introduced, women in Jah Kunda underutilized them compared to those in Jaka Madina since they had complained again and again about the quality of the implements, especially their iron bars. It is regarded that the reason why, with the same implements provided to the both villages, women only in Jah Kunda complained was due to the fact that they were more sensitive to the quality by utilising more implements within the villages.

Considerations and Suggestion for Future Activities

The target women became aware of the possibility of reducing time needed for the cultivation by using the animal traction, and accordingly increased the sizes of their fields. However there were big differences between the results in the two villages. The underlying cause is the differences mentioned above. Among them, the most persuasive one would be the size of fields women used to cultivate before the project started. With the observation during the two year of project implementation, it can be said that the appropriate size for groundnut cultivation by women would be around 0.7 ha, considering the following facts; 1) the average field size of 0.3 ha in Jaka Madina before the project increased to 0.7 ha with the project; 2) the average field size of 0.7 ha in Jah Kunda remained the same even with the project; and, 3) groundnut production involves not only seeding, weeding and harvesting which the project targeted, but also several post-harvest activities such as drying, packing and transporting to collection points. This does not mean that there is no possibility of expanding fields to more than 0.7 ha. In fact there are some women actually cultivating more than that.

What the result of the project suggests is that more impact could be achieved if the project is to be implemented in villages with conditions similar to that of Jaka Madina. Even under such situations, the project should be implemented under the supervision of extension staff or staff of DAS in order to capitalize on the useful technical advices, such as appropriate spacing between rows for easier weeding with the implements, adherence to seeding, fertilization and weeding at the appropriate periods, and drying after harvest.

6.2.2 Vegetable Production, Processing and Preservation Project

Problems of malnutrition and food shortage occur in villages during the rainy season. Vegetables are one of the strategic products to overcome the problem. In this regard, there are gardening activities being implemented for women at the target villages. Vegetables easily perish and lack of access to markets results in losses to farmers, thus in this project, training on compost making, integrated pest management (IPM), preservation and processing techniques were offered.

Table 6.16 Summary of Inputs

<table>
<tr><td rowspan="5">Site</td><td>Village</td><td colspan="2">Target</td></tr>
<tr><td>Fatoto</td><td colspan="2">1 group 25 persons per group Total area 0.25 ha</td></tr>
<tr><td>Touba Tafsir</td><td colspan="2">1 group 28 persons per group Total area 0.25 ha</td></tr>
<tr><td>Mansajang Kunda</td><td colspan="2">1 group 25 persons per group Total area 0.25 ha</td></tr>
<tr><td>Kossemar Tenda</td><td colspan="2">1 group 25 persons per group Total area 0.25 ha</td></tr>
<tr><td>Schedule</td><td colspan="3">First Cycle
1) preparation：Nov. 2003～Feb. 2004
2) implementation：Dec. 2004～Mar. 2004
Second Cycle
1) preparation：Nov. 2004～Feb. 2005
2) implementation：Dec. 2005～Mar. 2005</td></tr>
<tr><td>Personnel</td><td colspan="2">The Gambian side
1) Farmers
2) DAS Extension Workers
(DAC, ADAC, SMS, VEW) etc.</td><td>JICA side
1) The Study Team</td></tr>
<tr><td rowspan="2">Necessary Inputs</td><td colspan="2">The Gambian side
First Cycle
Farmers
1) Fencing Poles
2) Seeds
3) Labour

DAS
1) Fuel and Gasoline for monitoring</td><td>JICA side
First Cycle
1) Materials for fencing
2) Well
3) Hand pump (PB Mark II)
4) Water tank (2000 litres)
5) Fertilizer
- Urea (2 bags/ha)
- Compound (2 bags/ha)
6) Seeds
7) Materials for solar drier
8) Cooking utensils
- Fuel and Gasoil for monitoring</td></tr>
<tr><td colspan="2">Second Cycle
Farmers
1) Fencing Poles
2) Seeds
3) Labour
DAS
1) Fuel and Gasoline for monitoring</td><td>Second Cycle
No</td></tr>
<tr><td>Allocation to Villagers</td><td colspan="3">Villagers compensated 5 to 10 % of invested equipments and materials, the condition of which was decided referring to the condition of other donors. This share of cost was kept in their bank account and used for their project management.</td></tr>
</table>

6.2.2.1 Activities

The main stakeholders comprised of farmers, staff of the DAC office including SMS and field extension workers, and the study team. Farmers, as the principal beneficiaries of vegetable production, held village or kafo meetings as implementation progressed. The staff of DAS (SMS and extension workers) had regular and frequent visitors to the sites. In fact, the field extension workers visited the sites almost daily, even during weekends to ensure that project production activities were undertaken efficiently and on time.

Table 6.17 Work Schedule of the Vegetable Project

		2003			2004								
Activity	person in charge	10	11	12	1	2	3	4	5	6	7	8	9
Preparation of schedule	DAS and The Team												
Sensitisation workshop	DAS												
Identifing NGO	The Team												
Modification of schedule	DAS and The Team												
Purchasing items	AFET(NGO)												
Well Digging	AFET(NGO)												
Nursery Period	DAS												
Cultivation	DAS												
Compost Training	DAS and AFET												
Training for Neem	DAS												
Training for Processing	DAS and AFET												
Harvesting	DAS												
Participatory Evaluation	DAS												

		2004			2005								
Activity	person in charge	10	11	12	1	2	3	4	5	6	7	8	9
Nursery Period	DAS												
Cultivation	DAS												
Compost Training	DAS and AFET												
Training for Neem	DAS												
Training for Processing	DAS and AFET												
Harvesting	DAS												
Participatory Evaluation	DAS												

(1) Activities of farmers

1) Preparing group garden, using inputs of wells, fencing materials, etc.
2) Cultivating vegetables at group garden of 0.25ha for each village
3) Attending training on compost making (first cycle: 4 times, second cycle: 7 times)
   Compost making training was conducted at each verification sites in the first cycle, and it was conducted at the same villages, rice farm at SMS's, and Banjul in the second cycle.
4) Attending training on IPM (first cycle: 4 times, second cycle: 4 times)
   At the initial stage IPM training was not intended; however, as pest damage was found at Mansajang in the first cycle, it was conducted at the four verification sites.
5) Attending training on vegetable processing and preservation techniques (first cycle: 4 times,

second cycle: once)

For the purpose of long preservation, livelihoods improvement, improvement on living condition, training on vegetable processing and preservation techniques of tomato pasting and pepper sourcing were carried out. It was carried out at all the four verification villages in the first cycle and at Fatoto, where the farmers asked for training on tomato puree in the second cycle.

Also, they held discussions on:

- Cost sharing (5% of fence cost, well digging cost and hand pump cost);
- Plots demarcation for selected members;
- Land cleaning and fencing activities; and,
- Benefit sharing (among group).

Table 6.18 Number of trained farmers （Unit : People）

	Fatoto	Touba	Mansajang	Kossemar	Total
Compost	21	22	39	20	102
IPM	37	38	34	33	142
Processing/Preservation	55	28	23	25	131
Total	113	88	79	78	358

(2) Activities of counterparts

The staff of DAS (SMS and extension worker) had the key contacts between farmers and the projects. They had many roles (tasks) including as farmer trainers, facilitators or coordinators of meetings and workshops etc. Their frequent visits to the site were very important to ensure that the project production activities were done efficiently and on time. They were particularly active in activities such as:

a. Undertaking periodical monitoring of the activities of villagers and DES/VEW; once in every two weeks (SMS) or two visits weekly (extension worker).
b. Serving as a facilitator (SMS) or assistant (extension worker) to the village workshops (planning and evaluation)
c. Preparing reports of the results of the villagers workshops (SMS)
d. Conducting training and providing advice for executing and managing the farmer trainings on the compost making and processing/preservation (SMS)
e. Conducting farmer trainings on compost making, IPM and processing/preservation (extension worker).
f. Preparing the village performance and situation report monthly (SMS) or by fortnightly (Extension worker)
g. Providing technical advice to individual farmers and groups
h. Coordinating production activities of farmers

Particularly active in;

- Regular monitoring
- Technical advice to farmers and groups
- Skills training in vegetable production through method demonstrations and farmers participation in all the production operations.

6.2.2.2 Output

(1) Output on vegetable production

Though the number of direct beneficiaries among the four villages was 103 people, it became more than 600 people who got information from trained farmers from neighbouring farmers and villages. The project intervention targeted 0.25 ha vegetable schemes in Fatoto, Touba, Mansajang and Kossemar and comprised of 25 participants in each of the sites, except 28 in Touba, selected by the communities themselves. The project purchased fencing materials for 1ha to be able to accommodate the non-selected farmers later for the vegetable production at the same communal garden. This is because one of the objectives of the verification project was to observe the impact made by this intervention on the non-selected farmers.

Table 6.19 Number of farmers who got information from trained farmers（Unit : People）

	Fatoto	Touba	Mansajang	Kossemar	Total
Compost	37	0	0	45	82
IPM	30	2	16	0	48
Processing/Preservation	45	25	2	45	117
Total	112	27	18	90	247

1) Vegetable Production

a) All the four villages encountered constraints with regards to access to the seeds. Currently most of the seeds and fertilizers were provided by DAS; however in the long run, it is necessary for farmers to find their own way to get seeds sustainably. Already some farmers crossed the border to Senegal to acquire cheaper and greater choice of various seeds.

b) In Fatoto, where the underground water level is about five meters from the land level and farmers do not have private gardens, group garden was actively promoted, planting various kinds of vegetables for both consumption and sale. It is noteworthy that production and sale of vegetables increased, and accordingly the consumption of these products particularly by needy groups such as pregnant mothers and children improved markedly.

c) In Touba, where the water level is very shallow, anyone can easily have their own well by digging a few meters; consequently, many people had their own private garden to grow various vegetables and utilized the group garden uniquely to produce onion mainly for

sale.

d) In Mansajang, which is located close to the regular market of Basse and where the underground water level is about three meters from land level, not so many young farmers had a strong eagerness to participate in group farming, and consequently maintenance of the group garden was not conducted on a regular basis.

e) In Kossemar, the underground water level is relatively deep, and as such it is difficult to access enough water for vegetable production. Furthermore, most of the vegetables produced were consumed. As it is difficult to find reliable marketing channels, farmers in Kossemar generally resorted to the marketing in groups.

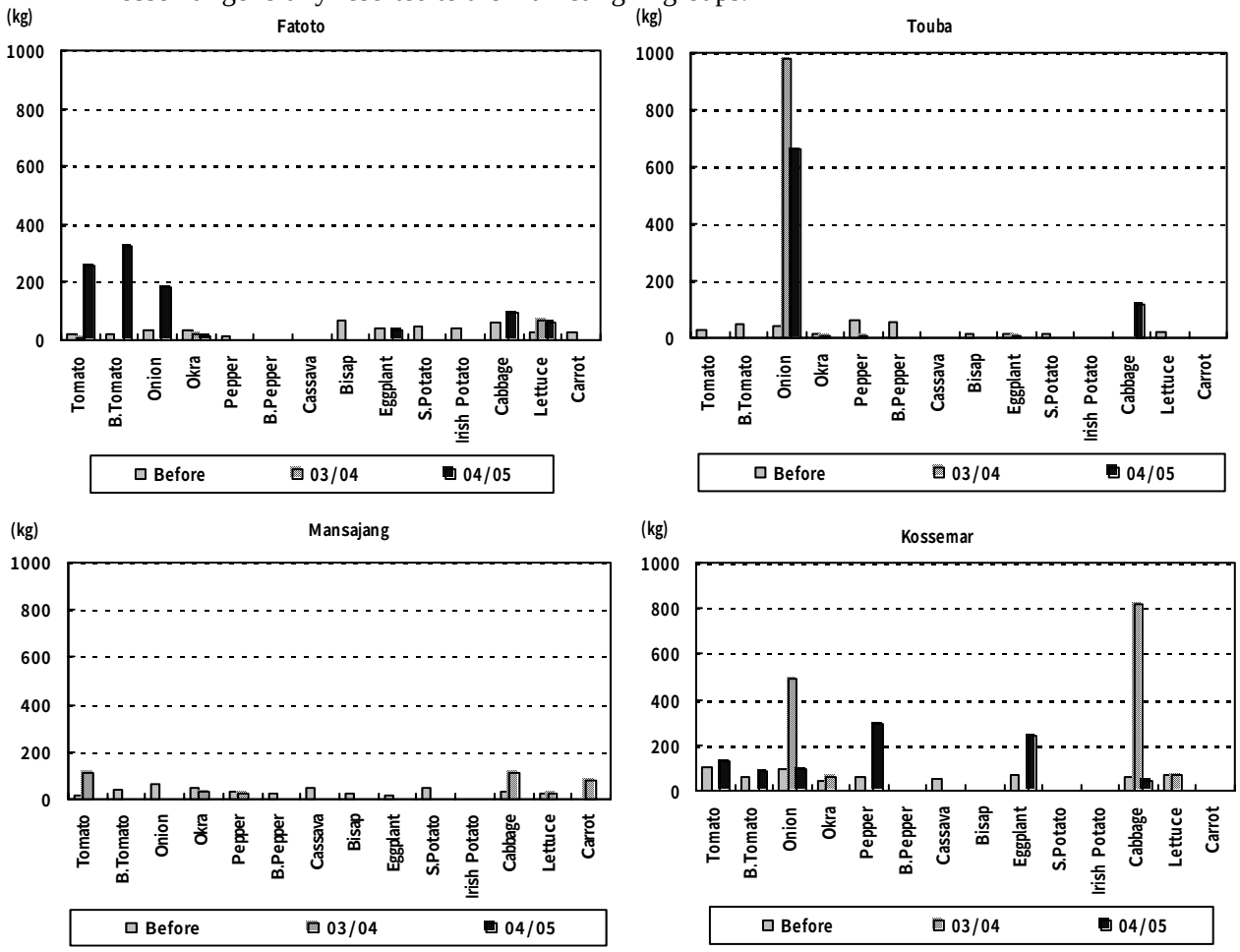


Figure 6.3 Changes of Vegetable Production

2) Processing and Preservation

Tomatoes are processed to paste, peppers are processed to source or pickles, sorrels are processed to chutney or jam, and okra and amaranths are dried. In the study, training on processing and preservation was carried out using tomatoes and peppers, as they degraded easily.

Table 6.20 Vegetable Processing

Village / Vegetable	Fatoto	Touba	Mansajang	Kossemar
Tomato	Paste	Paste	Paste	Paste
Pepper	Sauce	Sauce	Sauce Pickles	Sauce
Sorrel	Chutney Jam			Chutney
Okra	Dried		Dried	
Amaranths	Dried			Dried

3) Nutrition improvement

All the villages replied that variety and amount of vegetable consumption.

Table 6.21 Changes in Vegetable Consumption

	Fatoto	Touba	Mansajang	Kossemar
Changes in Consumed Varieties	• Number of consuming varieties increased.	• Number of consuming varieties increased. [Increased varieties are pepper sauce, tomato paste, dried chilli, potato leaves, and amaranths.]	• Number of consuming varieties increased from that of before the project. [Year 2003/2004 Increased, but Year 2004/2005 decreased]	• Number of consuming varieties increased as accessibility to seeds increased.
Changes in Consumed Amount	• Consumption amount increased in overall, especially vegetables.	• Consumption amount increased in overall.	• Consumption amount increased in overall. [Year 2003/2004 Increased, but Year 2004/2005 decreased]	• Consumption amount increased in overall.

(2) Output on capacity building of counterpart personnel

- Reporting (Monitoring Report)

  SMS submitted the monthly report to DAC. Also each extension agent submitted weekly report to the SMS. The contents of the report comprised of activities, findings, problems and solution undertaken by SMS, DES, VEW, etc.

- Monitoring

  SMS visited each verification site twice per month during the vegetable cropping season with VEW or DES.

  SMS and extension worker had regular and frequent visitors to the verification sites. In fact, some extension workers undertook almost daily visits even during weekend to ensure that the project production activities were undertaken efficiently and on time. In the field,

SMS not only advised farmers but also monitored the activities of extension workers.

- Arrangement of meeting or workshops

  SMS conducted meetings or workshops to discuss with farmers. In these meetings and workshops, extension worker also participated as facilitators.

  During the project period, PMU members visited the sites with the SMS or extension workers presenting highlights of the project.

- Trainings

  SMS and Extension Workers participated in the trainings as facilitators or assistants. SMS or extension workers also conducted some trainings.

  Through these trainings SMS and extension worker prepared training manuals. These were very useful for technical transfer not only to farmers, but also for training other extension workers.

  This manual is useful for continuous training activities by farmers themselves requiring occasional assistance from extension workers.

  The manuals prepared by project included the following:

  - Quick compost making manual prepared by SMS Horticulture
  - IPM manual (use of neem extract) prepared by SMS Pest Management
  - Training Programme for Processing/ Preservation prepared by the Extension Worker from Food and Nutrition Unit

6.2.2.3 Evaluation

(1) Verification of Hypotheses

In this project, four hypotheses were set with the purpose of providing feedback to the Master Plan. The results of the hypotheses and the lessons learnt through the Verification Project are highlighted below.

Hypothesis 1: In villages that are located close to markets, it is easier to reduce marketing risks to the farmers.

In the case of villages which have Lumos (weekly market) like Fatoto, farmers sell their products not only on market days but also to other non–market days as well. In this way, they could earn some amount of money every day. However, some farmers do not sell at the Lumo as many other farmers from surrounding villages market their product at the Lumo, culminating in a glut and lower retail prices. An alternative marketing strategy is to sell the product to adjacent markets in Senegal.

Hypothesis 2: Villages, in which both crop and livestock are managed intensively, should be selected

as target villages, to achieve an optimum combination between crop and animal husbandry. Such villages should have easy access to animal manure, which is ideal for producing organic fertilizer.

In compound which have domestic animals, it is easier to access animal manure and also to manage the compost. This facilitates compost production at the compound and its eventual transfer to the garden. Consequently, such farmers prefer to make compost at their compounds than at their gardens. In the target area, many small ruminants are raised, it is therefore easy to link vegetable production with livestock raising. However, if the demand for organic materials increases, farmers will have to collect them not only from their neighbours but also from the community.

Hypothesis 3: Promotion of compost making will increase availability of organic matter and improve the fertility of soils.

In URD, many farmers simply apply dried cow dung or a mixture of dung and dried grass directly on the soil around plants. After the project, farmers who participated in the training started to make and apply compost. Farmers also recognized the advantages of the compost as soils on which compost has been applied are dark and have better water retention.

Hypothesis 4: Promotion of small-scale vegetable processing and preservation will reduce post-harvest losses, minimize marketing risks and improve household nutrition.

In the workshops, participants of the processing and preservation training indicated that the impact of the training has contributed greatly to improve their nutritional status and reducing the amount of post-harvest loss to their products (perishing due to spoilage). Many farmers also recognized the importance of nutrition improvement.

(2) Feedback to the Master Plan

Apart from the above mentioned hypotheses, lessons learned from the project and ways for their feedback to the Master Plan are shown in the following from four points; agricultural technology, extension approach, improvement of living condition and implementation structure.

Table 6.22 Feedback to the Master Plan from Vegetable Verification Project

Feedback Points	Lesson learnt from the project	Ways to feedback to the M/P ( ) refers to the projects in the M/P
Agricultural Technology	• In addition to the training within their communities, farmers should be accorded more opportunities to visit other advanced areas to get new ideas on agricultural techniques and to compare it with what they practice.	⇒ The need to conduct exchange visits and group field trips in the M/P activities. **(All)**
	• Compost making should start from September or October. This will enable the farmers to use their compost in vegetable gardens in the dry season.	⇒ The need for extension workers to frequently communicate with farmers. Also, Continuous training should be provided through DES or VEW through groups. **(B-10)**
	• Compost materials can be collected from small ruminants which are grazed in their villages.	⇒ Farmers should know the difference between manure and compost usage by better utilizing of organic materials in the village. **(A-6)**
	• At the end of March in URD, temperature increases and the vegetable production is degraded.	⇒ Planting period should be considered carefully. If it is shifted later, vegetables need to be shaded under the sun. **(B-10)**
Extension Approach	• There are two types of vegetable production in URD. One is at private garden in small number and the other is at communal garden in large number.	⇒ Different approaches should be considered as production potential or social states between private garden and communal garden is different. **(A-9, B-10)**
	• A community garden can be used effectively as a kind of agricultural school for new technologies. While farmers try to acquire new technologies on the field, they bring it to their individual farms to increase productivity and production.	⇒ Communal garden should be fully utilized for technology transfer. **(A-9, B-10)**
	• Marketing activity is not fully effective, as it is carried out individually on either private or communal production.	⇒ In order to maximize the merit of group farming, it is essential to encourage group organization. **(B-10)**
	• By conducting trainings on vegetable production and processing, these techniques can be extended to other	⇒ Better selection of training participants and contents of the trainings, which match to farmers'

Feedback Points	Lesson learnt from the project	Ways to feedback to the M/P ( ) refers to the projects in the M/P
	farmers and applied to other vegetables.	needs, should be considered carefully in order to achieve effective extension. **(A-1, B-10)**
Improvement of Living Condition	• As production increases, home consumption increases, especially by pregnant women and children.	⇒ Effects of nutrition improvement by vegetable consumption should be published by collaborating with FNU at DOSA. **(C-15)**
	• Many farmers at all the verification villages had high interest on vegetable production, processing and preservation techniques.	⇒ Techniques on verification projects and group management will be continued. **(B-10)**
	• By acquiring vegetable processing and preservation techniques, the quantity of vegetable consumption at home and selling will increase.	⇒ Vegetable can be consumed more at home and have better value as farmers, especially women acquire vegetable processing and preservation techniques. **(B-10)**
	• Farmers take risk-averse strategies no matter how far their location is from markets.	⇒ It is recommended to utilise market price information for vegetable production and processing **(B-10)**
	• Farmers use water wells in gardens both for vegetables and domestic use. In the morning, women come to the well for watering their vegetable crops and for washing their clothes, at the same time. The well also functions as the place where they can chat and exchange information on daily life. Hence, there might be problems of water shortage for their crops.	⇒ It has become more important that beneficiaries plan their water use for their crop and domestic use before deciding the size of the vegetable garden. If well digging is considered in the M/P, it has to cover support for both irrigation and domestic water. **(B-10, B-12)**
	• Consumption amount at home increases by increasing processed tomato and pepper at village which has wells but not deep ones and produce vegetables.	⇒ It is preferable to conduct training on tomato and pepper process especially in villages which focus vegetable production on home consumption. **(B-10)**

Feedback Points	Lesson learnt from the project	Ways to feedback to the M/P ( ) refers to the projects in the M/P
Implementation Structure	• A few projects conducted under other agencies have enough technique or technical support. • Extension Workers did monitoring and management, but they had difficulties in data collection. • There is no need to distinguish tribes in order to promote mixed-farming.	⇒ Technical support is to be provided to coordinate agriculture related projects mainly by DAC. **(C-15, C-16)** ⇒ It is inevitable to have reports on effectiveness of projects, when projects are conducted, using funds and donations. It is required to continue capacity building of extension farmers in collecting data. **(C-15, C-16)** ⇒ It is not necessary to establish tribe-specific projects. **(All)**

6.2.2.4 Considerations and Suggestions for Future Activities

As mentioned earlier, the vegetable project was implemented in the last two seasons - 03/04 and 04/05 seasons. This part describes considerations and suggestions for project sustainability in the four targeted villages as well as the possibility of replicating the project in other villages in URD.

Analysis of the four villages involved in vegetable production

(1) Status before implementation

Before the project started in October 2003, the Study Team assessed the status of farmer groups in the four villages covered by the verification project with the DAS officers. Based on analysis of the baseline survey, the four parameters: experience in vegetable cultivation, current skill level, awareness and cohesion of group activity and possibility of sustainability were examined. These are evaluated at four grades, Very high, High, Moderate and Not high. The results are tabulated below.

Table 6.23 Status of Vegetable Cultivation before Implementation

Items / Village	Experience	Skills	Group Awareness	Sustainability
Kossemar	High	Moderate	Very high	High
Touba	Very high	High	Moderate	High
Mansajang	Moderate	Not high	Moderate	Moderate
Fatoto	Moderate	Moderate	High	Moderate

The following points should be noted in connection with the above assessment:

1) In Touba, judged to have the highest current skill level, vegetable garden activities were directed towards individuals.
2) In Kossemar, which had the strongest group awareness and cohesion, the leadership of the secretary of the VDC was observed to have permeated the group.
3) In Touba, which had the lowest level of group awareness and cohesion, the possibility was considered that conservatism could be preventing information from reaching women.
4) In Fatoto the target group was small and is largely family based.

(2) Status after implementation

In each village, the farmer groups participated fully in the project. However, as many of the participating female members in Mansajang were elderly, the level of performance on the activity was lower than the other villages. The preliminary assessments of the farmers' groups were revised as shown below, in light of the progress and results of the implementation.

Table 6.24 Status of Vegetable Cultivation after Implementation

	Experience	Skills	Group Awareness	Sustainability
Kossemar	-	Hihg	Moderate	High
Touba	-	Very high	High	Very high
Mansajang	-	Moderate	Moderate	Moderate
Fatoto	-	Very high	Very high	Very high

1) There were no major differences among the villages, in skill potential with the exception of Mansajang, however Touba emerged one step ahead. Differences are more apparent between individuals. At the present level, strict adherence to appropriate planting times makes greater contributions to (effects) outputs (from production to sale) than the sophistication of individuals' husbandry practice.
2) In Fatoto, the experience of successfully growing on second trials was observed to have raised the levels of group cohesion and personal motivation.
3) Both villages went beyond local markets to identify markets in Senegal, although there were differences of scale. For example, Touba can access the market in Velingara 15km away, and is selling large quantities of onions (at prices higher than domestic markets, after exchange rate conversions). Fatoto, on the other hand, sells to local markets along the border in Senegal. The villages were observed to have considerable success in opening up diverse sales routes even within the country, by travelling to weekly markets and to other villages which are not well suited to vegetable production.

Comparison of the verification projects during two seasons from opinion surveys of Touba and Fatoto, which have experienced successful crop production.

a. Purpose and method

As described previously, of the villages participating in the vegetable verification project, Touba performed best in the 2003/2004 season, and Fatoto in the 2004/2005 season. Five members from each village were selected at random and asked for their personal opinions on "decision-making system", "intervention by JICA/Extension", "input availability", "marketing" and "plan for next season", with the aim of learning from the changes in performance in these villages. In the course of the verification project, the study team limited their involvement in the second trial only to monitoring. The farmers, DAS office and extension workers handled input procurement, problem solving, training and other tasks. Among the interview topics, "decision-making" was addressed in Touba, where there is cultivation in both communal and private gardens.

b. Results and observations

Decision making

This question, intended to probe the differences in decision making about work on communal land and private land concerning the verification project, was asked in Touba. Rice was planted in the verification fields during the rainy season of 2004/2005, and the actual harvest conducted much later than the farmers expected from early-maturing varieties, resulting in a delay in preparations for vegetable planting. The rice planting decision was led by the men. The decision to grow onions the previous year, which was successful, was also led by the men. The men also developed the sales route to Vellingara in Senegal. During the vegetable season, irrigation is required twice a day: morning and evening, requiring travel to and from both fields. The work was divided between the communal gardens in the morning and the private gardens in the afternoon.

Intervention by the Study Team/Extension Worker

Fatoto		Touba	
・ training on processing	2pers.	・ Increasing support by extension	4pers.
・ training on compost making	2pers.	・ decreasing support by the team in 2nd year	3pers.
・ training on IPM	2pers.		
・ well	3pers.	・ helpful support form the team	2pers.
・ decreasing support by the team in 2nd year	1pers.		

This question investigated views and attitudes to the assistance received from the Study Team, DAS staff and village extension workers under the verification project over the two years.

Some farmers in each of the village mentioned that the reduction in assistance from the study team influenced the production significantly in the second year. This opinion as well as the comments on the positive effect of the specific trainings appear to reflect the desire to gain improved skills. Some farmers in Touba remarked on the increased support from extension workers. The work of the extension workers is expected to be highly effective as a channel for communication between villages, and from the villages to other areas. As such, its continuation is important.

Input availability

Fatoto		Touba	
・ late seeds procurement	2pers.	・ poor germination of seeds purchased	4pers.
・ not enough seeds	2pers.	・ difficulty in seed procurement	1pers.
・ poor germination of seed purchased	2pers.		
・ difficulty in seed procurement	1pers.		
・ borrowed seeds	1pers.		

Both villages had problems procuring seeds. Even when they obtained seeds, there was a problem with poor germination. Securing better seeds, cutting procurement costs and assisting in keeping own seeds are urgent tasks for the future.

Marketing

Fatoto		Touba	
・ market glut	5pers.	・ easier last year. than this year	1pers.
・ importance of processing skill	3pers.	・ lack of selling space for our vegetables at the markets	3pers.
		・ lack of market channel	3pers.
		・ problems for transport	4pers.
		・ difficulty in fixing the producer price	1pers.
		・ market glut	1pers.

Marketing measures are a major problem in both villages. Farmers in Touba gave many diverse and specific opinions on the issue. Promotion of processing was raised as a solution to the market glut problem in Fatoto. These opinions are based on successful experiences in both villages, so they should be viewed as practical proposals for future action. In addition to the strengthening of management skills, assistance in this area is also a very important need.

Plan next season

Fatoto		Touba	
・ own seed collection/retention	1pers.	・ increasing for processed goods	2pers
・ increasing for processed goods	2pers.	・ crop diversification	1pers.
・ crop diversification	1pers.	・ preparation of production plan	1pers
・ increasing group contributions	2pers.	・ intention to build more contacts with middlemen to increase outlets	1pers.
・ preparation of production plan	1pers.	・ change source of seeds	1pers.
		・ change nursery site	1pers.
		・ intention to contribute to sustainability	1pers.

This question asked farmers in the two successful villages what plans they have for the future. In Fatoto, they gave opinions of own-collection/retention of seed and increased financial contributions. On the other hand, Touba emerged with a more diverse range of opinions; they included employment of a manager for the revolving fund and diversification of middlemen. These ideas concern sustainability and it is vitally important that support continues until they are put into operation. In particular, the view that a specialist should be employed to manage an increasing revolving fund appears to be an independent view of the women, who lack bookkeeping skills but want to take the lead in vegetable cultivation.

Suggestion for future activities

Sustainability is high in Touba, which has the experience of succeeding with the first verification trial, and Fatoto, which has with second verification trial. However, in all the four villages, several activities especially on marketing were conducted by the farmers which went beyond the study's assumption that they consume most of their produce and sell only the remaining at neighboring lumos. The experience of successfully cultivating one crop in Touba has triggered spontaneous moves by the farmer groups towards expanding sales channels (negotiations have begun with the Commissioners Office towards getting a shop at the Basse regular market). In addition to support with skills, capacities must be built in management-related areas, such as income and expenditure management and bookkeeping. As there are differences in the backgrounds of these villages, the following proposals can be envisaged for future development directions.

Touba: Organize with the vegetable production groups in the nearby villages of Dampha Kunda, Chamoi and Tambasansang, group purchases of materials and joint sales of produce, share information, process goods and work towards the formation of a vegetable marketing association. Vegetable production in the above four villages take place on land owned by the individual farmers in areas with high water table levels giving those villages an advantage over other areas. If they can receive assistance towards better organization, then they will

have high potential for development.

Fatoto: It will still take time before Fatoto can be at level with Touba in aiming to form a marketing association. The farmers appear to have gained considerable self-confidence from the experience of growing a second verification trial successfully, but there is still room for further stabilization of production through better farming practices. Simultaneous sowing leads to gluts from harvests. Ongoing training is required to improve farming practices, including staggered planting and to diversify the processed goods. In a similar manner as Touba, some nurturing of vegetable production management capacity is required.

Kossemar: This village was afflicted by insect pests during the two growing seasons. The basic countermeasures are to undertake vegetable production as early as possible, introduce staggered cultivation and increase the proportion of local vegetables.

Mansajang: From the results of activities to date, it appears that it would be better to aim for production of numerous crops in small volumes, for auto-consumption and small-scale marketing, rather than attempting to make dramatic advances. The ageing of the group membership should be resolved in the short-term. Large numbers of weeds have been observed in the vegetable fields in both growing seasons. They appear to have infiltrated the fields earlier. Plowing (including tractors and other equipment) is one option that should be considered.

6.2.3 NERICA Trial and Extension Planning

The verification study on NERICA aimed at investigating the development potentials and future perspectives in URD through collection of data and information concerning the growth performance of NERICA and farmers' impressions. The analysis of data and information on the adaptability of NERICA to local conditions in URD was followed using extension plan for URD upland farmers. In the Verification Study, three types of trials were carried out. One was to identify acceptable upland NERICA varieties through URD farmers' own observation on growth, yield and post-harvest processing, and also palatability tests, and referred to as "On-farm Demonstration Trial". The second one was to investigate differences in performances of suitable varieties relating to the inclination among different hydrological conditions, and between fertilizer application levels (including no application), and referred to as "Varietal Screening Trial". The last one was "Adaptability Test" in which the adaptability of NERICA rice to upland area with less moisture is verified since upland rice requires more water compared to other cereals. This test was conducted in 2005/06 season in 8 fields at the north bank of URD.

Table 6.25 Summary of the Inputs

	Farm	Target
Site	**a. On-farm demonstration** Griroba Cluster farm Sotuma Samba field	 1 field, Total area 0.5 ha 1 field, Total area 0.4 ha
	b. Varietal Screening Trial Giroba MFC farm	1 field, Total area about 1,500 m^2 (7.5m x 30m x 5 varieties)
	c. Adaptability Trial Naudeh, Mbaye Kunda Jah Kunda, Sutukoba	2 fields each, total 8 fields
Schedule	**First Cycle (a and b)** preparation：Nov. 2003～Mar. 2004 implementation：May 2004～Nov. 2004 **Second Cycle (c)** preparation：Feb. 2005～May 2005 implementation：June 2005～ Nov. 2005	
Personnel	**The Gambia side** DAS - DAC, ADAC, SMSs, DES, VEW Farmers	**JICA side** The Study Team

Input	**First Cycle** **a. On-farm Demonstration** Farmers Labour DAS Fuel for monitoring **b. Varietal Screening Trial** Farmers Labour DAS Fuel for monitoring	**First Cycle** **a. On-farm demonstration** NERICA Seeds Fertilizer **b. Varietal Screening Trial** NERICA and non NERICA seed Fertilizer Sampling bag Sickle Scale Fencing pole and Fence Soil analysis
	Second Cycle **c. Adaptability Trial** Farmers Labour DAS Fuel for monitoring	**Second Cycle** **c. Adaptability Trial** NERICA and Common Upland Variety Seed Fertilizer, Sampling bag, Sickle Scale ,Fencing pole, Fence, Soil analysis

6.2.3.1 Activities

Table 6.26 illustrates the work schedule of the on-farm demonstration project of NERICA trial project and Table 6.27 illustrates the work schedule of the Varietal Screening Trial of NERICA trial project.

Table 6.26 Work Schedule of On-farm Demonstration Project

		2003			2004								
Activity	person in charge	10	11	12	1	2	3	4	5	6	7	8	9
Preparation of schedule	DAS,The Team		■										
Information collecting	DAS,The Team			■									
Procurement of inputs	The Team						■	■					
Introductrory workshop	DAS,The Team								■				
Seeding and weeding	DAS									■			
1st soco-eco evaluation	DAS											■ ■	

		2004			2005								
Activity	person in charge	10	11	12	1	2	3	4	5	6	7	8	9
2nd socio eco evaluation	DAS,The Team	■											
Harvest ans measure	DAS	■											
3rd socio eco evaluation	DAS,The Team		■										
Data analysis	DAS,The Team		■										
End of 1st season worshop	DAS,The Team						■						

Table 6.27 Work Schedule of Varietal Screening Trial of NERICA Project

		2003			2004								
Activity	person in charge	10	11	12	1	2	3	4	5	6	7	8	9
Preparation of schedule	DAS,The Team												
Information collecting	DAS,The Team												
Procurement of inputs	The Team												
Seeding and weeding	DAS,The Team												
Germination check	DAS,The Team												
Plant height & tillering	DAS,The Team												
Heading check	DAS,The Team												
Water level measurement	DAS,The Team												

		2004			2005								
Activity	person in charge	10	11	12	1	2	3	4	5	6	7	8	9
Plant height & tillering	DAS,The Team												
Heading check	DAS,The Team												
Water level measurement	DAS,The Team												
Sampling for yield	DAS,The Team												
Yield components	DAS,The Team												
Data analysis	DAS,The Team												

(1) Activities by farmers

a) On-farm Demonstration Trial

On-farm Demonstration Trials have been carried out in two villages, namely, Sotuma Samba Koi and Basse Nding. In two on-farm trial sites, locally recommended cultural and husbandry practices were observed. Farmers from the surrounding villages were invited to visit the farms to make observations on the varieties at tillering, flowering or maturity and at post-harvest stages of crop development. These visits provided the farmers with the opportunity to identify and score varieties based on varietal performance and farmers' selection criteria.

a-1) Sotuma Samba Koi site

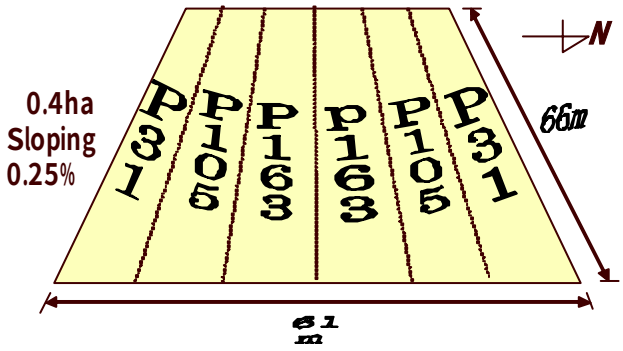
At Sotuma Samba Koi site, a farm size of 0.4 ha was planted on 21st - 24th June to three NERICA varieties in equal plots measuring 0.133 ha per variety.

Data collection has been done on plant height at harvest, growth duration, grain yield and lodging susceptibility per plot or variety using a 1 sq.m quadrat. Soil characteristics of the sites also were recorded. The National Agricultural Research Institute has carried out the data collection by contract under the supervision of the study team and counterpart personnel in URD. Five male villagers were cooperating to cultivate NERICA varieties in their farms. And 30 evaluators were invited from surrounding 5 villages.

Methods

Farm: Sotuma Samba Koi Demonstration Farm, 1 acre (=0.4ha)

	Paddy condition from late rain season to early dry season
Plot design:	refer to drawing below
Varieties:	WAB450-1-B-P105-HB
	WAB450-11-1-1-P31-HB (=NERICA5)
	WAB450-1-B-P163-4-1-HB
Planting date:	21st - 24th June 2004
Planting:	Direct seeding by drilling at the rate of 60kg/ha in 30 cm row spacing
Fertilizer:	Basal dressing: NPK 15-15-15 at 100kg/ha
	Topdressing: Urea at 50kg/ha on 28 August
Data collection:	Agronomic traits/characteristics: plant length at harvest, grain yield (kg/ha) and lodging susceptibility
	Sociological score of traits/characteristics: vigorous growth, vigorous tillering, pests and diseases, plant height, leaf color, weed suppression, panicle, grain, easy harvest, yields, post harvest processing, milling quality, palatability, swelling capacity. etc.



Result and Discussions

i) General Growth Progress

Plant growth went on well as the farmers weeded their fields early and also applied fertilizer on time.

In addition to the skilled male rice growers in the village, the hydraulic condition was also helpful for vigorous growth of plants. Despite the fact that plant growth was delayed after sowing as a result of one week drought, this trend changed after

normal rainfall started. There was only one rainy day for a week after sowing. However, in the following weeks it was raining almost every day or every two days. Seasonal inundation occurred in the trial field in early September as expected, and the surface water had continuously been covering the trial field even after the harvest. When the inundation started, the rice plants had reached the height of over 50 cm, which was high enough not to be submerged. The flooded water helped the growth of rice and inhibition of thick weed. However, it makes the harvesting activities difficult. Upland NERICA could be grown in paddy field conditions.
The results obtained are indicated in table 6.28.

Table 6.28 Results at Sotuma Samba Koi

Village	Sotuma Samba Koi		
Plot / Condition	paddy		
Variety*1	P31	P105	P163
Plant height at harvest (cm)	76.2	103.6	110.0
Lodging susceptibility	No lodging		
no. of panicles /m^2	103*3	175	183
no. of spiklets /panicle	76.8	103.7	74.9
no. of spiklets /m^2	7,910	18,148	13,707
000grain wt（g）	29.3	29.6	34.6
% of rippened grains	58.6%	46.8%	51.4%
paddy yield (g/m^2) *2	135.8*3	251.6	243.9

*1) P31: WAB450-11-1-1-P31-HB(NERICA 5), P105: WAB450-1-B-P105-HB, P163: WAB450-1-B-P163-4-1-HB
*2) moisture contents converted at 14%
*3) figure after off-types removal

ii) Result of Farmers Evaluation

Farmers' evaluation criteria for varietal selection for major agronomic traits differed from one growth stage to another. At the vegetative stage, most farmers selected varieties based on plant vigor, tillering ability, plant height, leaves, etc. In the first evaluation workshop at vegetative stage, 26 farmers ranked P105 and P163 highly, which followed by P31 for their preference. The most important criteria for the selection was vigorous tillering, followed by good germination, high plant population, green leaves and tall plant height in descending order. There was no gender difference in the criteria.

At the maturing stage, most farmers observed the harvest related traits. In the second evaluation workshop at maturing stage, 15 farmers attended and gave the highest score to P105 and P163 again, which gained a significant lead over P31 due to the traits of large panicle, tall plant, many grains, plant shape and early maturity in descending order.

When farmers evaluated the traits on the cooking process and palatability of NERICAs, farmers from Sotuma Samba Koi area (27 persons) and Basse Nding area (21persons) gathered and par-

ticipated in the evaluation workshop together. Evaluation on cooking process was done by only female evaluators, because males never cook. There was no difference among the three varieties on milling quality and cooking easiness. However, P105 and P163 were more palatable than P31 for these farmers.

According to the integrated evaluation, P105 and P163 were preferred by the farmers around Sotuma Samba Koi area.

a-2) Basse Nding site

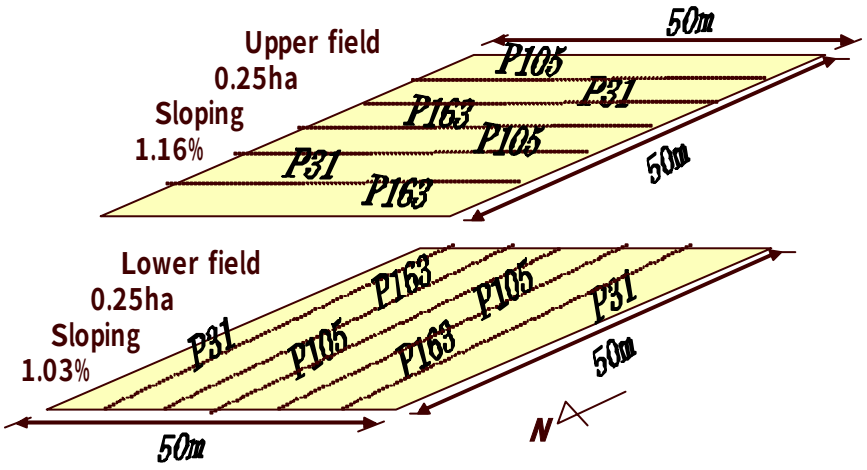
At Basse Nding site, a farm size divided into two 0.25ha equal fields was planted on 26th June with three NERICA varieties sown in equal plots measuring 0.083ha per variety in two fields (upper and lower). The crop husbandry and data collection were the same as in the Sotuma Samba Koi site mentioned above.

Two women were involved in the cultivation of NERICA as on-farm trials in their farms. Also thirty five participants were involved from six surrounding villages, including Mansa Jang Kunda, Kaba Kama, Samba Tako, Giroba Kunda, Sabuseri and Basse Nding itself.

Methods

Farm:	Basse Nding Demonstration Farm, 0.5ha
	(divided into upper field: 0.25ha and lower field: 0.25ha)
Plot design:	refer to drawing below
Planting date:	26th June 2004
Fertilizer:	Basal dressing: NPK 15-15-15 at 100kg/ha
	Topdressing: Urea at 50kg/ha on 30 August

Varieties, Planting, Data collection: These are the same as the case at Sotuma Samba Koi, above



Result and Discussions

i) General Growth Progress

The lower field had high groundwater table and was located at the seepage zone. When a tractor was plowing the lower field, seepage water started to come out from the underground. And the field has gentle undulations. So after heavy rain, puddles could be found in this zone. Along the way according to observations from extension workers and farmers on the ground, young seedlings at the bottom of the undulations were damaged or their growth was inhibited due to the stagnant water, and vigorour hydrophitic weeds aggravated the damage to rice seedlings. So the growths were uneven and there were missing plants galore in lower field. However, the rice plants which stood on top of the undulations showed normal growth and maturity. NERICA in upper field performed better than those at the lower level, but at the edge of the upper fields, some showed signs of damage by ruminants or donkeys.

And it was not easy to control weeds in both the upper and lower fields by the two female farmers. WARDA is emphasizing weed competitiveness as one of the NERICAs' advanced features, however, these particular three varieties did not indicate such competitiveness in the trial.

The results obtained are indicated in table 6.29.

Table 6.29 Results at Basse Nding

Village	Basse Nding					
Plot / Condition	Upper (dry)			Lower (hydromorphic)		
Variety*1	P31	P105	P163	P31	P105	P163
Plant height at harvest (cm)	92.4	107.8	106.4	ditto	ditto	ditto
Lodging susceptibility	No lodging					
no. of panicles /m^2	145	137	123	115	91	71
no. of spiklets /panicle	112.1	179.5	117.3	116.3	116.5	116.5
no. of spiklets /m^2	16,255	24,592	14,428	13,375	10,602	8,272
000grain wt（g）	30.1	30.9	38.1	30.5	29.7	38.3
% of rippened grains	45.1%	35.7%	47.6%	51.8%	54.7%	58.2%
paddy yield (g/m^2) *2	220.8	271.1	261.7	211.4	172.2	184.4

*1) P31: WAB450-11-1-1-P31-HB(NERICA 5), P105: WAB450-1-B-P105-HB
P163: WAB450-1-B-P163-4-1-HB

*2) moisture contents converted at 14%

ii) Result of Farmers Evaluation

In the evaluation at the vegetative stage, 28 farmers attended the evaluation workshop and ranked P105 and P31 highly, followed by P163. The most important criteria for the evaluation was vigorous tillering, followed by plant height, good germination , good rooting and green leaves.

The result of the evaluation at maturing stage shows that P 105 was superior to P31 and P163 due to the traits of large panicle, early maturity, tall plant, many tillering and grains in descending order.

At the evaluation on cooking process and taste, although almost no difference was found among varieties, the taste of P31 was most popular. This result of the palatability test for the farmers from Basse Nding area was completely opposite to the one for the testers from Sotuma Samba Koi area.

By the evaluation throughout all workshops, P105 was more preferred due to the plant features, P31 was preferred due to the palatability. The evaluation of P163 was lowest.

b) Varietal Screening Trial

The objective of this trial lays emphasis on the introduction of upland varieties, mainly NERICA varieties identified in the PVS screening by NARI along the entire stretch of the toposequence. These ranges from the upland ecology to the inland valley level at the MansaJang Kunda village farm. Two sets of five varieties were tested under fertilized and non-fertilized conditions to determine the response of the varieties along the slope. The plots each measuring 7.5 m x 70 m were planted to five upland varieties (three upland NERICA varieties and two non NERICA upland varieties) along the length of the entire slope and put under observation during the cropping season. In addition to collecting data on rainfall, temperature and humidity; three PVC pipe wells were laid at regular intervals along the plot one at each of upper, moderate and paddy land ecologies to monitor the water table during the rice growing period.

Methods

Experiment:	Varietal screening trial (Mansa Jang Kunda village)	
Plot Design:	refer to drawing below, fenced to prevent entry of stray animals	
Varieties:	WAB450-11-1-1-P31-HB (NERICA 5)	
	WAB450-1-B-P105-HB	
	WAB450-1-B-P163-4-1-HB	
	WAB365-B-1-H1-HB	(not NERICA variety)
	WAB56-50	(not NERICA variety)
Planting date:	20th June 2004	

Planting method: 60 kg/ha direct seeding by drilling at 30 cm between rows

2 treatments (with/without fertilizer) × 5 varieties × 5 rows / variety

Fertilizer: [Treatment with fertilizer]

Basal dressing: NPK at 100 kg/ha after 5days of seeding

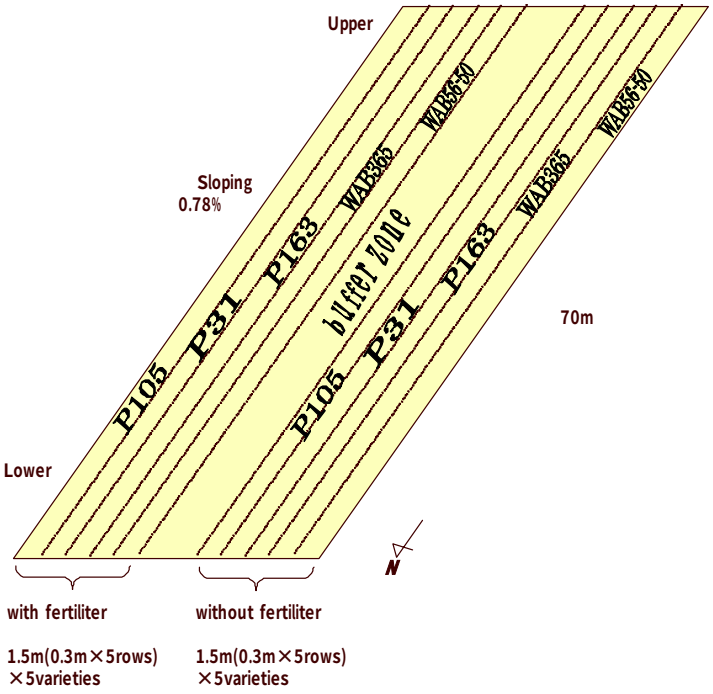
Top dressing: Urea at 50 kg/ha in two split doses at vegetative and reproductive stages, namely after 21 and 45 days of seeding

[Treatment without fertilizer]

Basal dressing: none

Topdressing: none

Data collection: rainfall, temperature, humidity, water table, plant length, number of tillers, heading number, grain yield (yield components), lodging susceptibility and disease damage



Result and Discussions

i) General Growth Progress

The rectangle trial plot was designed to lay on a slope. This trial comprised of 5 different varieties replicated into two replicas. One of these replicas was applied with fertilizer and the other without fertilizer, all were divided into 3 zones, namely: upper level, moderate level and the paddy level.

After emergence, plants of the different levels started growing well. According to the extension officer, plants at the moderate level where growing faster followed by the upper level and then the paddy level. However, the result of ANOVA on plant length showed no significant differences.

The extension officer reported that before the topdressing on the varietal screening trial, crops of the area where there was no fertilizer were growing faster particularly at the upper level. However, after topdressing on the other site known as the with fertilizer area of the trial, changes occurred as plants of the area with fertilizer changed posture looking greener and growing taller than those on the opposite site area after a few days. This observation was ascertained by the ANOVA on plant length.

Around the active tillering stage, the groundwater table reached ground level in the whole field. Even the upper level field was covered by surface water for more than three weeks. It meant that the three field levels did not have big differences during the tillering stage.

Though fertilizer was applied on all levels of the with fertilizer area, the growth with fertilizer in the paddy level was worse than without fertilizer area in the same level. Growth in the paddy level was affected by floods. Some plants particularly those located around the area where fertilizer was applied suffered greatly because of their depth, being closer to the bottom of the back swamp.

ii) Growth characteristics

According to the result of ANOVA on fertilizer application, a significant difference at 5% occurred between with fertilizer and without fertilizer from the plant length measured on 4th October, at harvest stage, in the upper level. However, no significant difference on plant length was observed in the moderate and paddy levels. Furthermore the number of tillers showed no difference in all levels.

c) Adaptability Trial in the 2005/2006 Cropping Season

During the 2004/2005 cropping season, NERICA yielded highly; however, the selected verification sites were located in hydromorphic areas, which were not real uplands. In order to properly guide upland farmers in URD to cultivation on NERICA, information concerning local adaptability of NERICA varieties was needed. In areas where rainfall is low there is some risks that the NERICA will not perform well.

Four sites were selected for the verification study for the 2005/2006 cropping season, and trial was planned with the following principles:

1) Extension to small-scale upland farmers must be considered;
2) Despite above tractor ploughing and chemical fertilizer were carried out in all the verification field plots to ensure uniformity of the conditions;
3) Verification field plots should not be selected at encloses in research station, but as demonstration in farmers fields;
4) Verification fields are set in northern half of URD because the area has disadvantage in terms of access and communication;

5) Verification sites are dispersed because of rainfall difference among the sites;
6) The inadaptable areas for upland NERICA will be studied, because the water requirement of rice is much more than millet, maize and sorghum;
7) The effectiveness of fertilizer application and cropping pattern should be assigned to the Gambian side in the future. The JICA study team could not deal with them in this verification study (due to time constraint); and,
8) In consideration of the importance of animal husbandry in the area, pesticides and herbicides should not be applied.

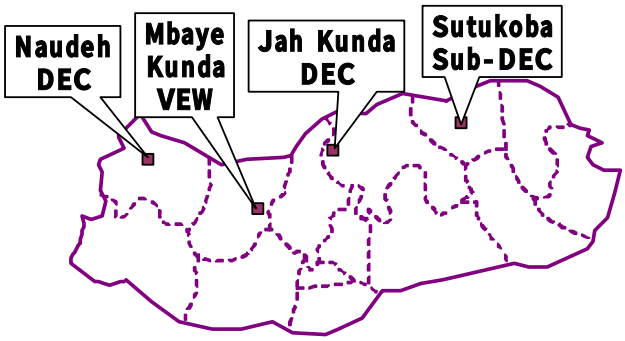
Table 6.30 Work schedule of NERICA Adaptability Trial

		2005								2006			
Activity	person in charge	5	6	7	8	9	10	11	12	1	2	3	4
Site selection for 2005	DAS,The Team												
Preparation of seeds	The team												
seeding	DAS,The Team												
Growth measurement	DAS,The Team												
Yield measurement	DAS,The Team												
Meteorological data	DAS, Meteorology												
Data analysis	DAS,The Team												

Methods

Four (4) varieties were tested, i.e. three (3) NERICA varieties and one (1) non NERICA variety. NERICA seeds were acquired from the verification study during the last season (2004/05), and non NERICA seeds were provided by the Divisional Agricultural Office in URD, which is selling rice seeds to farmers. The Purity of all the seeds was very poor, and the specific gravity with salt was at 1.13, and manual removal of foreign type varieties were treated on all varieties tested.

Farm: four (4) sites
in Sandu District: Naudeh and Mbye Kunda,
In Wuly District: Jah Kunda and Sutukoba
each site has two farms, all farms are protected by barbed wire fence



Plot design: refer to drawing below

Varieties: four varieties

NERICA varieties

1) WAB450-1-B-P105-HB

2) WAB450-11-1-1-P31-HB (=NERICA5)

3)WAB450-1-B-P163-4-1-HB

non NERICA varieties

4) ATM3 (ATM: Agricultural Taiwanese Mission)

Tractor ploughing date: Naudeh 28th June 2005

Mbye Kunda 29th June 2005

Jah Kunda 4th July 2005

Sutukoba 2nd, 7th July 2005

Planting date: Naudeh 30th June

Mbye Kunda 2nd July

Jah Kunda 5th July

Sutukoba 6th , 7th July

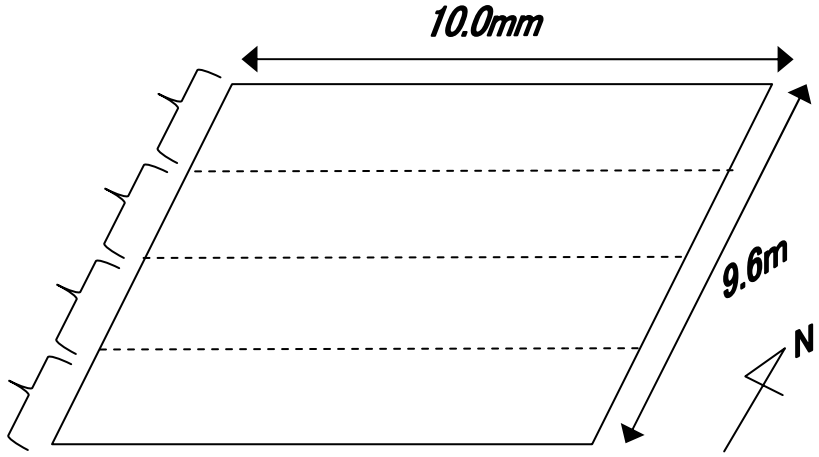
Planting: Direct seeding by drilling along east-west at the rate of 60kg/ha in 30 cm row spacing

Fertilizer: Basal: NPK 15-15-15 at 100kg/ha

Top dressing: Urea at 25kg/ha each, twice on 21 and 45 days after sowing

Data collection: Agronomic traits/characteristics: plant length, culm length, panicle length, flag leaf length, grain yield, yield components, growth duration, lodging susceptibility and disease damage

Soil analysis is done by IRD (Institute Development Research), Dakar, Senegal



Soil Analysis:

Two kinds of soil analysis were carried out, namely: physical properties and chemical properties in 8 farms. The physical property was determined by soil texture, and for the chemical properties, such items as pH, EC, organic matter, total C, Total N, exchangeable Mg, exchangeable Na, exchangeable K, exchangeable Ca, CEC, available Fe, available Mn, Al, Cu, Zn were analyzed. The samples were taken from two strata as follows: 0-15cm and 15-30cm per spot.

Most of the farms had loamy soil, but some parts of Mbaye Kunda had sandy texture and Sutukoba had relatively high clay content as shown in the table below.

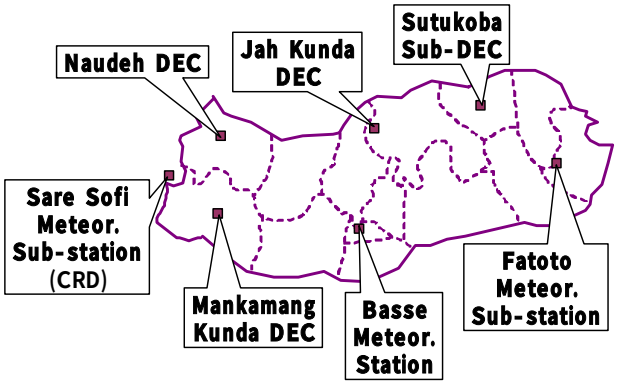
Table 6.31 Soil texture at Adaptability Trial Farms

District	Village	Name of farm	Soil Texture	
			0~15cm	15~30cm
Sandu	Naudeh	DEC	sandy loam	sandy loam
		Farmers'	loam	loam
	Mbye Kunda	South	sandy loam	sandy loam
		North	loamy sand	loamy sand
Wuly	Jah Kunda	DEC	sandy loam	sandy loam
		Farmers'	sandy loam	sandy loam
	Sutukoba	Mawdo	loam	clay loam
		Arafang	loam	loam

According to the result of chemical properties, the soils were acidic in all the trial farms, with pH(H_2O) values ranging from 4.9 to 6.4. From the viewpoint of soil fertility, it is characterized by the poor content of the three nutrient elements (N, P, K) and extremely low CEC. Exchangeable cations and micronutrients also showed low values in general. These chemical properties can be attributed principally to the poor content of clay and organic matter in these soils. However, it is judged that there would not be direct damage to the crops due to the acidity or excess of harmful elements.

2) Meteorological data:

In addition to the 3 verification sites i.e. Naudeh DEC, Jah Kunda DEC and Sutukoba sub-DEC, the rainfall data have beeen collected from Basse meteorology station, Fatoto meteorology sub-station, Mankamang Kunda DEC and Sare Sofi meteorology sub-station. Daily data of



temperature of maximum, minimum and mean, also humidity and daily sunshine hours at Basse meteorology station have been also collected.

Table 6.32 Rainfall Data in Basse

	May	Jun	Jul	Aug	Sep	Oct	Total
Sarre Sofi Meteor. Station	18.5	118.7	317.8	267.9	214.1	120.9	1,058
Makamang DEC	16.7	97.4	268.7	384.1	360.2	60.4	1,188
Basse Meteor. Offfice	24.7	66.8	296.5	313.6	322.3	58.8	1,083
Fatoto Meteor. Station	49.2	119.6	133.2	262.9	278.7	115.0	959
Naudeh DEC	35.9	106.9	338.0	336.5	321.6	46.0	1,185
Jah Kunda DEC	44.5	118.7	324.7	190.2	297.5	60.5	1,036
Sutukoba VEW	64.3	140.6	592.6	270.9	310.4	72.0	1,451

General Growth Progress

Emergence of all tested varieties was very good in all farms because of the pre-treatments at seed selection and enough soil moisture. Emergence of shoots took only for 4 or 5 days after sowing, and seedling establishment was also even. After germination, constant rainfall could help the growth of seedlings. The observation of each trial farm is expressed as below.

〔 **Naudeh** 〕

The trials were implemented in the two agricultural fields of DEC's and farmers' group's. These 2 farms were located away from the Gambia River and the soils were loamy.

DEC farm: The trial farm spanned two different areas in which different crops were cultivated in the previous years. Therefore difference of growth appeared between the eastern half and the western half of the farm. Even after dressing twice, it was obvious that the growth in worse part could not catch up with the ones in better part. Moreover, the DEC farm was verminated right after heading by locust and beetle. The study team had decided not to use agricultural chemicals for a series of trials. However, a local extension officer applied insecticide to solve the situation since Japanese Study Team were absent at that time. It is not clear if diluting was conducted appropriately by the extension officer. Spray of the insecticide, however, brought browning symptom on leaves and might affect grain filling. Plots of P163 and P105 where were located at both ends of DEC farm particularly suffered from browning symptom.

Farmers' farm: The field has been restarted since this year, 2005, after 10-year fallowing. The biggest problem of the farm was weeding. The farmers' group only worked on

weeding on the predetermined days; weeds were not removed on a timely basis. There always, hence, were weeds in the field, which brought competitive stress to rice plants.

〔 **Mbaye Kunda** 〕

This village was selected as low soil fertility area because of its sandy soil texture. The Study Team implemented trials on two farms owned by a local farmers' group. The farmers' group has been cultivating upland crops in the field. They were closed to the Gambia River but were not influenced by water level fluctuation. However, two trial farms are located in gently sloped area to the River. When it rains heavily surface water runs over the field into the River. The Study Team noticed the condition in the beginning of the verification trial period and dug collector drain canal around the trial farms. Heavy rainfall, however, collapsed sandy waterway and eventually let two farms suffer from run-off water. In addition, nitrogen deficiency brought about leaves yellowing to all the varieties in the both fields. First topdressing of urea did not seem to have reached to rice roots because there was no improvement in terms of leaves' colour or growth in the both farms. The farmers' group weeded appropriately. No disease or insect damage was observed.

Northern farm: Rice plants did not grow properly in the farm eaten by flood damage even after the second topdressing. The number of plants kept decreasing because of death; there was little yield in the end.

Southern farm: The second topdressing improved leaves colour as the farm did not suffer from run-off water after the mid of growing period. However the stagnation of plants growth affected the yield badly.

〔 **Jah Kunda** 〕

The village is far from the Gambia River and has high altitude, 45 meter. The two trial farms were selected as typical upland condition areas. Both farm lands consist of sandy loam. One field belonged to DEC and used to be cashew nut farm until 2002. It was converted to upland crop field where maize and cowpea were mixed in the rainy season in the last two years. The other field belongs to an individual farmer; crop rotation of groundnuts, sorghum, fallowing and sorghum has been implementing. The greatest problem in the two fields was damage by termite. Both of the farms did not experience competition against disease, insect damage or weeds.

DEC farm: P105 was damaged heavily by termite.

Farmer's farm: The edge of the farm also suffered from feeding damage. The farm was surrounded by field where millet was cultivated last year and fallowed in 2005. The termite which came onto the residues of the millet cultivated previously invaded to the trial farm. Although termite caused lodging in P31 and P163 in the farm the plants grew smoothly as a whole.

〔 **Sutukoba** 〕

Although this village is located far away from the Gambia River, many farmers have experience of paddy rice cultivation. Two of them who are very good at cultivating paddy rice cooperatively allowed the Study Team to use their farm lands for the trial. The soil texture of Sutukoba contains more silt and clay: it has higher soil fertility than other areas. The both trial farms were managed appropriately in terms of weeding, disease and insect damage. The plants, therefore, grew up steadily.

Mawdo's farm: This farm was located in the remote hill surrounded by bush. That field restarted to cultivate in 2005 after 15-year fallowing.

Arafang's farm: The farm was located in the field where upland rice has been rotated.

Morphological and growth characteristics on tested varieties

The Morphological and growth characteristics of the varieties were shown in the Table 6.33 below.

Table 6.33 Morphological and growth characteristics on Adaptability Trial

Type	Varietal Abbre-viation	Colour				Presence of Awn
		Leaf sheath	Leaf blade	Husk	Apiculus colour	
NERICA	P 31	green	green	yellowish brown	red	non existence
	P 105	green	green	gold	red	non existence
	P 163	green	green	gold	red	non existence
Non NERICA	ATM3	green	green	gold	straw	non existence

Type	Varietal Abbre-viation	Plant length (cm) *	Culm length (cm) *	Panicle length (cm) *	Flag leaf length (cm) *	Resistibility to blast	Lodging	Thresh-ability
NERICA	P 31	68~106	50~85	18~21	19~27	no incidence	intermediate	difficult
	P 105	93～111	63~88	21~24	30~37	no incidence	intermediate	moderate
	P 163	79～106	61~95	17~21	20~29	no incidence	severe	moderate
Non NERICA	ATM3	68～80	48~59	19~21	20~25	no incidence	slight	loose

*：data of "Mbaye Kunda / south farm" were not included because of terrible growth

All the varieties had green colour on leaf sheath and leaf blade. Awn could not be seen in any of them. A common characteristic seen in all three NERICA varieties had red spot on the tip of green spikelet after heading. The red spot had disappeared after the husk maturing. It is easy to distinguish P31 from other varieties because of the brownish husk. ATM3 turned out to be the shortest culm variety in all the trial farms. However, none of the three NERICA varieties can be affirmed as shortest or highest since the plant lengths of the varieties varied in each farm. P105 had larger flag leaf and panicle than any other varieties. In addition, flag leaves of all the NERICA varieties were standing erect. The posture, therefore, looked as a good receiver of sunshine for photosynthesis unless rice plant lodges. While it

was clear that ATM3 hardly lodges thanks to its short length and panicle number type, three varieties of NERICA lodged without obvious reason. Although the correlation between culm length or panicle weight and lodging habit was hypothesized, the relationships between them were not found. Concerning the threshability and shattering habit, P31 showed the most difficult threshability: it was very hard to remove the grains of P31 from rachises and required much more workforce to thresh all grains. Loose threshability was seen in ATM3; it was losing the product even in the farms. Although it was reported that NERICA in Western Division was attacked very seriously by rice blast damage has not been observed in the last few years in URD. It might mean that URD has some advantage to prevent the outbreak of blast. NERICA varieties do not seem to have strong resistance considering the example in Western Division. Regarding diseases, one particular black fungus was observed on both outside and inside of husk. Although percentage of the fungus damage on grains was not so high it was observed in all trial farms and in all varieties. The damage seemed to reduce grain filling and grain quality.

Yield and yield components

The table below is showing the results of yield and yield components on the adaptability trial.

Table 6.34 Yield and Yield Components on Adaptability Trial

Village	Farm	P31					P105				
		No. of Panicle	No. of Grain	% of Ripened	Wt. '000 grains	**Yield (t/ha)**	No. of Panicle	No. of Grain	% of Ripened	Wt. '000 grains	**Yield (t/ha)**
Naudeh	DEC	121.3	79.2	73%	28.6	**2.0**	85.9	101.1	44%	28.3	**1.1**
	Farmer	105.5	66.1	68%	26.8	**1.3**	82.1	88.6	59%	27.4	**1.2**
Mbaye Kunda	South	90.5	56.0	75%	24.3	**0.9**	89.4	88.7	76%	27.8	**1.7**
	North	-	-	-	-	**-**	-	-	-	-	**-**
JahKunda	DEC	164.3	93.9	73%	30.4	**3.4**	48.6	97.0	51%	27.0	**0.7**
	Farmer	144.9	70.8	72%	27.0	**2.0**	106.2	91.1	68%	29.0	**1.9**
Sutukoba	Mawdo	156.5	77.1	76%	29.0	**2.7**	126.3	84.2	68%	29.8	**2.2**
	Arafang	218.0	75.3	71%	31.9	**3.7**	129.4	109.2	76%	29.8	**3.2**

Village	Farm	P163					ATM3				
		No. of Panicle	No. of Grain	% of Ripened	Wt. '000 grains	**Yield (t/ha)**	No. of Panicle	No. of Grain	% of Ripened	Wt. '000 grains	**Yield (t/ha)**
Naudeh	DEC	82.9	70.0	69%	34.5	**1.4**	268.7	65.8	69%	26.4	**3.2**
	Farmer	82.2	56.8	76%	33.3	**1.2**	215.0	53.9	82%	26.0	**2.5**
Mbaye Kunda	South	79.7	50.1	78%	33.5	**1.0**	151.6	60.4	80%	23.5	**1.7**
	North	-	-	-	-	-	-	-	-	-	-
JahKunda	DEC	152.4	73.0	77%	38.2	**3.3**	240.8	66.9	71%	26.2	**3.0**
	Farmer	118.9	65.2	69%	36.0	**1.9**	220.3	52.6	79%	26.3	**2.4**
Sutukoba	Mawdo	131.2	66.3	83%	37.7	**2.7**	294.9	52.7	71%	28.2	**3.1**
	Arafang	132.5	65.6	81%	37.4	**2.6**	276.7	58.9	87%	28.2	**4.0**

The yields of 2 farms in Sututkoba and DEC farm in Jah Kunda are fairly good except P105 in Jah Kunda which was attacked by termites severely. In spite of the shortest maturing duration, all varieties in Arafang farm in Sutukoba except P163 particularly shows the best production. Compared with the average yield of each farm, ATM3 (2.8ton/ha) showed the best yield that is followed by P31 (2.3), P163 (2.0) and P105 (1.7).

Regarding correlation between yield and yield components of each variety, positive and high correlation between the yields and the numbers of panicles per square meter could be seen in every variety (i.e. P31:R=0.942**, P105:R=0.913**, P163:R=0.983***, ATM3:R=0.882**). Moreover, all the varieties were found to have positive correlation between the yields and the grain weights (P31:R=0.955***, P105:R=0.867*, P163:R=0.981***, ATM3:R=0.864*). Other correlation was not observed.

Three of NERICA varieties have less number of panicles per square meter and a large number of spiklets and heavy grains: they can be called heavy panicle type rice. More yield can be expected by increasing panicles and more ripening by proper maturing practice. Sandy fields tend to have less yields than others which consist of rich silt and clay under the even fertilizer dosage practice. It is necessary to classify the area by the soil texture and to grasp appropriate amount of fertilizer to extend upland NERICA.

(2) Activities by Counterpart

During the NERICA verification study, the SMS on crop production has been playing vital roles, and fully involved in the activities of the study such as technical backstopping, monitoring and data collection and analysis.

In the preparation period of the NERICA Trial of the first year, the SMS was dispatched to Guinea Conakry to study the situation of NERICA at that country. The visit was conducted together with a senior researcher of NARI in order for the SMS to be more equipped with knowledge about NERICA. Other activities there included a discussion with SG 2000, a NGO actively supporting NERICA variety not only in Guinea but also in other countries in Africa.

6.2.3.2 Output

a) Contribution to Capacity Building of Counterpart personnel

In the 2005/2006, NERICA verification study four (4) extension staffs of URD north were involved. The SMS facilitated the process by explaining the objectives of the trials and the importance of careful data collection to the extension staff logically.

The SMS has rich experience as an extension officer, but he had not been very familiar with research activities. At the present, he has learned through planning the experiments and the trials for two (2) years. After the project is handed over to the Gambian side, he can design the trials effec-

tively.

b) Benefit of the Verification Project

Apart from the above benefits to counterpart staff, a lot of beneficiaries are in URD and the number of people is almost uncountable. At the beginning of the 2004/2005 cropping season, NERICA varieties were not well-known by URD farmers. But, many observers in the surrounding villages of the trial sites observed the growth of NERICAs, because the trial sites were located at the centres of two (2) highly populated cluster villages.

After obtaining satisfactory trial results, the above SMS disseminated it to URD farmers through Radio Basse. As a result of these activities, NERICAs became known throughout URD. A lot of farmers have since then visited the DAO and wished to register their name on the list for NERICA seed purchasing for the coming season. During the 2005/2006 season, many individual farmers and farmer groups planted NERICA in their upland fields. It is hoped that they can realize greater cereal harvests than before. The expansion of NERICA cultivation will not stop for a while. But, the basic data for extension are still missing namely appropriate type, amount and timing of fertilizer application and response to fertilizer by soil type, degree of drought tolerance of other NERICA varieties, appropriate cropping pattern in URD, etc. Results of these new trials will make NERICA cultivation more sustainable.

Another constraint is the low quality of seed due largely to lack of knowledge and management to maintain seed purity.

6.2.3.3 Evaluation

(1) Verification of Hypotheses

Two Hypotheses were formulated for the NERICA verification study in order to introduce upland NERICA cultivation to URD farmers.

Hypothesis 1: Cultivation along the toposequence (upland and lowland, gently sloping land) produces different results at each level

This hypothesis has not been verified yet, because during the 2004/2005 cropping season only hydromorphic (lowland) farms were tested in the study. Almost all area of the farms experienced submergence or seepage of groundwater due to high rainfall in the season.

In accordance with the lesson learnt from the study for the first season, typical upland farms were selected in the norht of URD for the second verification study. Sandy soil farm, loamy soil farm, highland farm, farm which has been fallowed for ten (10) years and newly re-started to cultivate at bushy area are included in the trial.

The results of the trial are expected to show some differences among the farm loca-

tions and conditions.

Hypothesis 2: The positive traits (drought resistance, disease and pest resistance, low fertilizer requirement, flavor etc) of NERICA will be realized on cultivation

The study to prove the second hypothesis is also still in progress. To prove some of the positive traits will require some more years especially the evaluation of resistances, adaptabilities, and fertilizer requirements or responses under different conditions. Even after the JICA Study Team leaves the trials needs to be continued because of the varying and fluctuating rainfall conditions.

However, according to the farmers who tasted the NERICA products in 2004/2005 workshop, NERICA varieties were palatable and satisfactory.

(2) Feedback to the Master Plan

It will take some time to prove the above hypotheses perfectly; however, some new constraints have been identified through the verification study. These constraints should be resolved for the expansion of upland NERICA varieties and are summarised below as lessons learnt.

Table 6.35 Feedback to the Master Plan from NERICA Verification Project

Feedback Points	Lesson learnt from the project	Ways to feedback to the M/P () refers to the projects in the M/P
Agricultural technology	• Transactions in NERICA seed has started, as the result of good performance of the varieties in 2004/2005 season. But the quality, especially maturity, purity and storing condition of the seed are very poor. The seed will be degraded quickly unless proper management skills of seed production are provided.	⇒ Training of potential farmers as seed growers throughout the production season and in transaction of NERICA seed is to be conducted. Seed business must be done with proper, strict and careful management. **(C-15, C-16)**
	• There is still remaining data to be collected under normal precipitation since the verification year, the 2004/05 season had unusually favourable rainfall.	⇒ The trial should be continued until enough data is collected. **(A-4)**

Feedback Points	Lesson learnt from the project	Ways to feedback to the M/P () refers to the projects in the M/P
Implementation Structure	• Extension staff have some functions to report their activity and undertake some data collection such as rainfall data monthly. But the data from them are not completely reliable. The data are important resources for analysis and prepare the development interventions; however, this is not always understood fully.	⇒ The project needs to continuously let them fully understand the value of data. Trainings and sensitization aimed at extension staff need to be continued. Capacity building of staff should be concentrated on collection of the required data in their sites.

6.2.3.4 Considerations and Suggestions for Future Activities

Important points in NERICA cultivation practices

Rice consumption has increased year by year in The Gambia. Rice production cannot catch up with consumption within the country. Gambia heavily relies on imported rice or aid rice. There are few farmers who are self-sufficient in rice production. Most of the farmers have to purchase expensive rice although demand for rice has risen in the rural area. In these circumstances, upland crop farmers who mainly produce cereals and groundnuts have expected to provide for themselves by introducing NERICA. The greatest obstacle of producing NERICA in URD is unstable and limited rainfall and poor soil. It is generally known that upland rice needs more than 50 mm rainfall per decade for optimum growth. It is presumed that a few drought years occurred in the past 15 years considering the rainfall data recorded in Basse and the limited water holding capacity of the soils. The years 2004 and 2005 as Verification Study Trial periods never suffered from dry weather though unstable but sufficient amount of rainfall was recorded during the growing period.

From the two-year Verification Study Trial period, important points in cultivation are described below.

(1) Optimal cultivation time

The soil texture of the farms in the area is mostly sandy or sandy-loamy. It is too hard to dig up by hand before rain starts. Therefore, farmers cultivate and sow seeds right after the early rains from mid-June to mid-July once the soil get softer. There is a common crop calendar of cereal cultivation in general. According to the past rainfall data recorded in Basse, it sometimes hardly rained for a few weeks after the heavy rainfall in mid or late June. In this case, young seedlings suffer from lack of water after germination. However, NERICA can be sown in the beginning to mid-July when rains are stable enough to enable sufficient growth up to the end of the rainy season since NERICA grows within 85 – 100 days. Drought damage to young seedling can therefore be reduced by late seeding.

(2) Seeding density and fertilizer dosage

The NERICA varieties used in the Verification Study Trial were of the heavy panicle type and most of them did not tiller a lot. During a series of Verification Study Trials, 60kg/ha, which is the recommended seeding density for rice seeding, was applied. It seems more ideal to increase seeding rate in order to secure adequate the number of panicles. However, comparative testing for Optimum Seeding Density (OSD) has not been made yet. OSD cannot be the same in each soil condition either. Hence, it is preferable to have continuous trials to find the OSD. In addition, fertilizing condition was uniformed in the V/S trial although the OSD should be specified depending on each soil condition. NPK (15:15:15) 100kg/ha was applied as a basal dressing. Urea 25kg/ha was topdressed twice in tillering stage and reduction division stage respectively. Considering the low retention capacity of the soil in URD, supplement of basal dressing and additional topdressing seems to increase productivity. After all, multiple trial should be made considering the following points; OSD testing has not been taken yet; OSD can be different depending on each soil condition due to dense sowing of paddy.

It is important to supplement organics by using cow manure and to implement crop rotation with pulse crops. Rice straw incorporation is effective as a fertilizer but its application should be considered carefully since it could expand termite damage.

(3) Disease and pest

The worst disease for rice production is blast. Large outbreak of blast has not reported in URD so far. However, upland rice is easier to have blast compared to lowland rice because of limited provision of silicic acid from irrigation water. Outbreak of blast may happen depending on weather condition and fertilizing condition. Therefore, one needs to carefully pay attention to upland rice to avoid occurrence of blast. In fact, it is reported that blast broke out in NERICA field in Western Division.

Damage by some beetles was partially seen in the trial sites. It is effective to treat farms with pesticides in the early stage. However, utilization of pesticides should be minimized in rangeland. It is essential to disseminate pesticides through the extension workers since small scale farmers know little about pesticides.

Termite damages were observed on sown rice seeds and roots. It is useful to clean residues in the farms to avoid termite damage since these pests tend to get closer to residues of harvested crops in the farms. Seed dressing with chemical powder is also effective, but it is necessary to remember the possibility of the powder being washed off by rain.

(4) Weed

It is said that NERICA has a competitive nature as much as *Oryza glaberrima* Steud. However NERICA used in the Verification Study Trials did not seem to have that kind of characteristics.

Weed is the second biggest stress after drought. Weed does not only decrease productivity or quality of upland rice but also create insect pest: farmers have to control it. Weeds particularly interfere with young rice seedling growth in the early stage and decrease crop yields. It is significant to encourage

weeding in the early stage.

Weeding by hand hoe is common. Intertillage weeding by donkey or sign hoe is effective for labour saving. However, weeding by sign hoe necessitates certain interrow spacing. It eventually reduces land intensity and is not appropriate for small-scale farmers.

Farmers have to be careful with the genus *striga.* The genus *striga* is parasitic weed that absorbs nutrient from other plant's roots and kill the plant. The genus *striga* largely break out because the weed produces tens of thousands of seeds. The genus *striga* can easily be eliminated by hand once it is found.

(5) Determination of optimal harvest time

The determination of the optimal harvest time is a very important post harvest technique, and is normally set 30days after flowering. From the appearance of the rice plants, the optimal harvest time is determined when the panicle changes the colour of most of its spikelets into gold and 2/3 of the tip of the rachis turn yellow. A delayed harvest would usually result in a severe break-out of cracked rice kernels, while an early harvest would induce in green rice kernels. In any case, the grain quality inevitably deteriorates. Therefore, it is very important to determine the most appropriate time for harvest.

(6) ATM3

ATM3 has higher and more stable productivity than any other varieties in the trials. However, those who carry out panicle level harvesting by knives may not introduce ATM3 since it has shattering habit and consequently bring about harvest loss. Furthermore, ATM3 is short culm variety. ATM3 was imported from Taiwan as irrigated rice. Therefore, ATM3's drought resistance in upland condition is not recognized yet. Since drought resistance is bottleneck in cultivation in upland field, one needs to collect cultivation data further in order to regard ATM3 as recommended variety.

6.2.4 Coordination Skill Development Programme

Several agricultural related projects have been implemented in URD with little coordination among them. This is to be improved upon with the offices of DAS and DLS which are expected to take the lead role and responsibility for the coordination. Under the Divisional Coordinating Committee, chaired by the Commissioner, each technical department is supposed to work on maximizing the impact of the projects implemented. DAS and DLS have been playing important roles in the agricultural sectors in the division. This program aims at enhancing capacity of the department staff for coordinating agriculture related projects effectively.

Table 6.36 Summary of the Inputs

Site	Village	Target	
	All URD	DAS Office, DLS Office, Project site in URD	
Schedule	1) preparation：Nov. 2003～Mar. 2004 2) implementation：Feb. 2004～Nov. 2005		
Personnel	**The Gambia side** DAS - DAC, ADAC, SMSs DAS extension workers DLS - DLO, ADLO	**JICA side** The Study Team	
Input	**The Gambia side** Office for computer etc.	**JICA side** Computer, Monitor, Printer, Scanner Digital Camera, Projector, Generator	

6.2.4.1 Activities

Table 6.37 Work Schedule of Coordination Skill Development Programme

		2003			2004								
Activity	person in charge	10	11	12	1	2	3	4	5	6	7	8	9
Preparation of schedule	DAS and The Team												
Purchasing items	The Team												
Modification of schedule	DAS												
Computer skill intro.	The Team												
Newsletter making	DAS, DLS												
Database preparation	DAS, DLS												
Database updating	DAS, DLS												
PMU meeting	DAS, DLS												
TAC/DCC presentation	DAS, DLS												
Community involvement	DAS, DLS												
Evaluation workshop	DAS, DLS												

		2004			2005								
Activity	person in charge	10	11	12	1	2	3	4	5	6	7	8	9
Newsletter making	DAS, DLS												
Database updating	DAS, DLS												
PMU meeting	DAS, DLS												
TAC/DCC presentation	DAS, DLS												
Community involvement	DAS, DLS												
Evaluation workshop	DAS, DLS												

Table 6.37 presents the work schedule involved in the programme. Activities carried out under the Coordination Skills Development Programme comprise of the following:

1. Computer training for officers in both the DAS and DLS and comprising of Subject Matter Specialists (SMS'), Crop Extension staff and Livestock Assistants;
2. Preparation and dissemination of agricultural Newsletters with two publications;
3. Establishment of a database involving the collection and collation of relevant data;
4. Conduct of the PMU meetings four times and the PMU field visit two times;
5. Presentation of the ANRE sub-Committee report to the Divisional Coordination Committee;
6. Community involvement (Radio communication); and,
7. Vegetable price data survey.

(1) Introduction to Computer Skills

Before implementation, the present conditions of office equipment and trainings on the related subjects were assessed. Both the offices of DAS and DLS were equipped with few computers and other necessary appliances. Therefore, only few staff had computer skills. In the middle of February 2004, almost all arrangements for computers were made and the training on computer skills and other necessary preparation started. The second phase of the training started in June 2004. This followed the first phase conducted since February, 2004.

Participants comprised of the staff from both DAS and DLS in URD. The main rationale was to introduce staff to basic computer skills in order to boost their management capacities especially in the area of report writing and data management. A new component was also introduced during the second phase to expose staff on how to use the Internet. Arrangements were made with a local Internet provider for staff to visit the Café twice a month, for 4 months starting July 2004 with visits facilitated by the trainer.

All trainings were on Microsoft Word and Excel and planned for one month in March and July, and to be conducted twice a week. The training actually provided most of them with the opportunity to acquire basic computer skills. Some of them excelled very well and have even started applying the skills to enhance their work.

In view of the above, it could also be observed that the DLS staffs have acquired basic computer skills and an enhanced ability in report writing. During the next stage they are expected to tackle data management. DAS staff may, on the other hand, not have acquired sufficient computer skills for enhanced report writing. In this regard, they will need more familiarity with computers

to acquire the skills necessary for them to prepare their reports by themselves using computers.

(2) Newsletter Production

As for the newsletter preparation, the format was made with some staff in DAS. The contents were filled through the computer training session. This was conducted as an on-the-job training which gave target staff the opportunity to get accustomed to the keyboard and word processing. At the same time, the visible output could be expected. Although, the frequency of issuing the newsletter is suggested to be every two months in order to coincide with the DCC meeting, it had to be slowed down to every three month, due to some other routine works such as tractor management and necessary actions required to tackle the locust invasion to the country.

Newsletters have been published quarterly, with five publications in March, June, September, December of 2004 and March on 2005. The Newsletter highlights the activities of the DAS, reports on the progress of the Study as well as current agricultural topics of URD, etc. It is edited by the DAC. The readership comprises of the Divisional Coordinating Committee (DCC) and Project Management Unit (PMU) member; Verification/Project groups and to the Central offices including the Department of Agricultural Services, Department of Planning and to the Department of State for Agriculture and other relevant organizations. However, the actual distribution has been restricted to a very few organizations in URD. The distribution should therefore be enlarged to cover all the above mentioned. In this initial phase, the Study Team assisted in computerizing the Newsletters, and eventually, all the publishing jobs have been carried out by counterpart staff.

(3) Database Preparation

With regard to the database, the project entry sheet was developed. Since the purpose of the database is to give a picture of all agricultural related projects in URD to the user, the database preparation was planned and actually conducted. However, the format prepared was revised to relate better to the routine tasks of staff. For example, SMS Production is to prepare and update the data on rice production in the division, while the SMS Horticulture is to keep the record of the existing garden schemes in the division. The prospective users of the database are staff of DAS and DLS as well as other interested parties. With the picture provided from the data, the staff can start coordinating agricultural related activities, such as deciding what the departments has to do and advising what other development partners are expected to do, and also where, when and how to complement all stakeholders activities, resulting in the maximization of their positive impact on farmers' living standard. The process of database preparation is on the way and each DES is filling the data sheets. The exercise is expected to last for three months. Upon

the establishment of the database, the DAS will be able to analyze all the existing and past projects in URD, identifying constraints and will subsequently facilitate better development planning. It is expected that the DLS office will undertake a similar process following that of the DAS.

Parallel to the establishment of the database of projects; updates on "LADEP intervention areas-2003" and "Village seed-stores including those requiring complete reconstruction" have been conducted. Analysis of the data highlights the condition of seed-stores in URD, indicating that they are in very poor state and therefore need urgent repairs. The establishment of the database involved SMS of various expertise/specializations. Consequently, the SMS for rice production is also going to prepare that of the NERICA. Subsequently, when DAS staff have to formulate and implement the M/P themselves, the experience from the database preparation and updating will prove quite useful and relevant in a sense of prioritizing necessary projects.

(4) PMU Meeting

During the period under review, the second official PMU meeting was held on 9th and 10th June 2004. Whilst the first day was devoted to the field trip, the second day was utilized for discussions. The meeting was attended by 11 members comprising of the Assistant Commissioner, DAC, CDO of DCD, 2 SMSs, JICA-Monitoring Officer, Director of Planning of the Council and representatives of AFET, DLS and DOP.

The field trips were conducted on the first day at the vegetable sites in Touba Tafsir and Kossemar and for the NERICA site in Giroba Kunda. The regular PMU meeting was held on the next day in the DAS office. At the commencement of the meeting, the DAC made a presentation on the Study detailing especially on the verification projects. After this, members of PMU deliberated on the presentation of the DAC and field trip of the previous day. The discussion focused mainly on the confirmation of the Study. Finally the Minutes of the Meeting were agreed upon. The conclusion arrived at this PMU Meeting was that the members of PMU were aware and understood the Study.

The third PMU meeting was held on 31st December, when the Study Team was absent. The postponed field trip by the PMU members which was supposed to be held before the December meeting was conducted in February. This was because they judged that it is suitable to conduct the trip in February when the activities in the vegetable gardens are more visible. This was attended by the Commissioner of URD together with the members attending the second meeting.

The fourth PMU meeting was planned in July 2005 and held on 19th of the month after the members visiting to the project sites of NERICA and groundnut on 18th. This meeting was jointly organized with the seminar of the Study to the Area Council, which is detailed in the section of 2.5.

(5) DCC sub-Committee presentation

The role of DAS and DLS is to prepare ANRE sub-Committee reports for the DCC and this role has been performed by these two offices sufficiently. ANRE sub-committee report for the period June – September and also October – December were presented in well laid-out and computer printed format which was not the case for the other sub committees.

(6) Community Involvement

Radio communication was implemented for the purposes of ensuring greater public awareness and fostering good public relations. The first content aired was related to the information about monitoring of the project for groundnuts and vegetables. The second one wihch was on air at the end of March 2004, focused on farmers' recognition and perception towards the Verification Project and the trainings including compost making, food processing and preservation and Integrated Pest Management. In this regard, arrangement was made with the SMS Communication. A 30-minutes slot of radio air time was also secured. The third on air covered farmers' voice from Touba Tafsir where the best performance was shown among the four vegetable verification sites in July 2004. This centred on the prize giving ceremony organized in commendation of the vegetable group in Touba Tafsir held on 20th June. Afterward, the radio programmes were prepared and aired according to the events taking place by the DAC office's initiative, and were also recorded and aired in the following weeks. The contents were farmers' voice on the Field Day of the Groundnut Project in Jaka Madina, and also threat of locust outbreak in URD.

(7) Vegetable Price Data Survey

This has commenced the collection of market price data from nine (9) markets in the division. The collection was carried out for a period of one year, starting in July 2004 and ended in June 2005. The Department of Planning (DOP) field enumerators were responsible for the collection under the supervision of the Study Team. The rationale behind the market price data collection in URD was primarily to establish the price trends for vegetable throughout the year in URD. The data will enable the DAS office in URD to advise farmers on the various types of vegetable to grow for better marketing. It will also form the basis for a feature Vegetable Price Database.

The provision of timely and reliable market data will also go a long way to help the DAS office to better plan the vegetable production calendar. Enhanced flow of market price information will help both farmers, extension workers and policy-makers improve vegetable production and maximize income. It will also indicate stock-gaps that affects both income and nutritional level of farmers. This exercise has been carried out with five (5) enumerators of the Department of Planning (DOP).

6.2.4.2 Output

a) Benefit of the Verification Project

The number of direct beneficiaries of the verification project comprises of 6 office staff and 16 field extension staff for DAS, and 2 office staff and 11 livestock assistants for DLS, together with 5 enumerators from DOP. Through strengthening of the capacity of the agricultural offices, farmers and the general population in URD also will benefit directly and indirectly. Almost all the activities of the project have been conducted within the division, except for several staff dispatched by the Study to Guinea and Senegal as part of the supplementary survey.

The Coordination Skills Development Programme was carried out according to the original plan and the progress achieved has been comparatively satisfactory. DCC report preparation has been achieved as targeted. Each of the activities should be continued for future success in project management and complimentary activities in food security. With the decentralization in progress working with the local government structures i.e. the Area Council, is one of the necessary tasks to that plans prepared by the department are implemented at the divisional level. The Study has been preparing the grounds and opportunities for discussions and dialogue between the department of DAS, DLS and the Area Council. The Director of Planning of the Council has been quite familiar and welcomes what the Study is trying to achieve. Unfortunately, in the last year of the Study, the Director of Planning left office, leading to concerns that the cordial relationship between the departments and the Council established could suffer some setbacks. However, frequent contacts with commissioners' office by the departments have been successful in creating another bond strengthening ties with the administrative authorities in the division.

b) Contribution to Capacity Building of Counterpart personnel

In order to strengthen the routine work of extension offices, a visit to an advance area in the field of agricultural extension was planned. It was about the new extension system, called ANCAR, recently introduced by World Bank in Senegal. The Study Team together with the Assistant DAC visited Tamba kunda, in December 2003. After the visit, the ADAC prepared the report in order to disseminate the idea of ANCAR to the other staff, especially the SMSs.

In addition to the attainment of the objectives set for the verification projects, the project contributed to the improvement of the work of counterpart agencies. These included the preparation of monthly reports by the DAS and quarterly report by DLS which were regularly prepared using the newly acquired computer skills. Printed reports are now regularly presented to the ANRE sub-committee. Furthermore, regular Monday meetings have been conducted by the DAS to update on progress of work and ensure interchange of opinions between the DAC, ADAC, SMS and Extension Officers.

6.2.4.3 Evaluation of Skill Development Program

Three assumptions were set for this groundnut verification project in order to draw important information from the project before finalising the formulation of the Master Plan. The findings for each assumption and lessons learnt, which should be fed back to the Plan are mentioned below.

Table 6.38 Feedback to the Master Plan from Coordination Skill Project

Feedback Points	Lesson learnt from the project	Ways to feedback to the M/P () refers to the projects in the M/P
Implementation structure	• As the rainy season starts, staff of the DAS office becomes very busy fulfilling their assigned duties. • The office staff should update the data periodically. With the data, they are expected to present more concrete and persuasive information to other organisations at any committee where their expertise is needed. • The local government may be able to fund an agricultural project in near future, including following up on the verification projects under the Study and initiating the components of the Master Plan. • Through the implementation of the verification projects, it can be said that the counterpart has acquired the capacity of project planning, implementation and supervision.	⇒ Schedule of the Plan is to be carefully prepared to avoid too much workload on staff in the rainy season. **(All)** ⇒ Support for regular presentations to DDC or PMU should be incorporated in the plan so that the DAS and DLS office can make their roles clear and maintain frequent information flow to the outside. **(C-15)** ⇒ In order to draw the attention of the local government, publication of newsletter is to be continued. The contents will be carefully selected to enable readers to obtain clear ideas of agricultural development in URD. **(C-15)** ⇒ Project management on technical field can be covered by the current staff of DAS and DSL but financial management of the project should be strengthened by installing a monitoring system from outside. **(C-15)**

Chapter 7 Conclusions and Recommendations

7.1 Conclusions

The Study has been verifying the efficiency and feasibility of the Master Plan which aims at livelihood and living conditions improvement since October 2003. Based on the results of the verification projects and the relevant sectoral policies in the country, the four concrete programmes include: A. Livelihood Improvement; B. Improvement of Living Conditions; C. Technical Support Service Strengthening; and, D. Capacity Building for Community, were proposed in the Master Plan. Each of the programmes comprises several project components, amounting to 19 components in total. As explained below, the efficiency of each of the programmes was confirmed through the verification of parts constituting the programme. Regarding programmes for which the efficiency could not be directly confirmed from the verification, the contents of the particular programmes were through feed back from the lessons learnt from other verification projects relevant to the programmes.

A. Livelihood Improvement Programme

As highlighted in the Gambia's PRSP (2002), strengthening of means of livelihood is a key to the mitigation of poverty in rural areas. In this regard, this programme proposed several project components which the farmers in URD, who are mostly dependent on agriculture can easily work with. Furthermore, the projects contribute to crop diversification. During the verification period, Groundnut Production Improvement project, Vegetable Production /Processing and NERICA Trial and Planning, part of the components in this programme, were undertaken. Through the projects, it was confirmed that there are still many gaps that need to be filled in the improvement of agricultural techniques and skills of farmers who can also improve their income status by participating in trainings on agricultural techniques. In addition, with the introduction of NERICA, the potential of upland rice is also confirmed. Animal traction technology can be employed for almost all the upland crops cultivated in URD, and therefore has the potential of promoting crop diversification. Considering the current situation, this programme comprises of the components addressing such technical advancement and crop diversification especially to upland rice and vegetables, together with the technical training components such as reactivation of the Giroba center, which therefore leading the farmers' livelihood improvement, one of the objectives of the Master Plan.

B. Improvement of Living Conditions Programme

Women play an important role in agriculture in the country. This programme proposed project components aiming at improvement of household food status and women's workload

mitigation both of which are also highlighted as key strategic interventions in the ANR sector policy. During the verification period, Vegetable Production /Processing, a part of the components in this programme, was conducted and improvement of nutritional status and increase in income were observed among the women members targeted. This programme was modified to finally comprise of the components especially targeting improvement of women's living conditions.

C. Technical Support Service Strengthening Programme

Under the recent decentralization process, it is the divisional agricultural office and livestock office that assume the leading roles in the coordination of technical support services in the agricultural sector. In this regard, this programme was proposed to improve quality of government led technical support service in the division. During the verification stage, Coordination Skill Development, the core components of the programme, was implemented.. With the implementation of the project, it is confirmed that extension staff not only provide services to specific projects but also undertake additional activities such as reporting and presentation to Divisional Coordination Committee (DCC), collection of agriculture related data among others. These are regarded as activities which can enhance the possibility of expanding the project's impact to other areas and also improve coordination between development organizations operating in the division. This programme includes several components to enhance the offices' capacity to handle agricultural related information, which is expected to make the coordination between the concerned organizations meaningful.

D. Capacity Building Programme for Community

As stressed in the PRSP/SPAII, community participation is crucial in the process of poverty mitigation particularly given the majority rural population of The Gambia. Based on this, this programme was proposed to provide trainings to the farmers to enable them become more aware of the conditions needed for the sustainability of their projects. During the verification stage, none of the components in this programme was conducted independently, but one of them- trainings for project sustainability and bookkeeping, was incorporated into the Groundnut project and Vegetable project. Due to these trainings, the farmers involved in both projects were able to show that they are well prepared for planning of next season's activities. It significantly helps the farmers benefit from impact of projects. In this regard, this programme is considered to be indispensable.

Efficiency of the four programmes as a whole

Programmes A. Livelihood Improvement and B. Improvement of Living Condition may

culminate in the creation of positive impacts on the community, without the enhanced capacity of the offices' staff in service delivery, impacts of projects will not be expanded and relocated in other communities. Similarly, without the enhanced capacity of the community in assuring project sustainability, impacts of project cannot remain and continue in the community. During the verification process it was observed that the capacity of target farmers' was improved under Programme D. Capacity Building of Community, gains from Programme A and B were enjoyed by the targeted communities. It was also observed that the capacity of the offices' and their extension centers' staff was strengthened with Programme C. Technical Support Service Strengthening, the fundamental to the feedback system of the concerned organizations were set up-this was previously lacking or not functioning well. At the same time, a channel of diffusing information from one area to another was through Newsletter publications and Radio broadcasts.

In Chapter 5, it was explained by illustrating Programme C., which is similar to the engine of a truck, that unless the engine is fully functional, the truck cannot reach the goal of the Master Plan-livelihood improvement and improvement of living condition for the farmers in URD, since without Programme C., impacts of each project component remain within the areas initially targeted, but not extended outside. In the course of implementing the verification projects, the capacity of the engine was enhanced up to the level that smooth implementation of projects in the division is secured to some extent. In other words, the system of delivering technical support services by the offices to farmers and any projects in the division was formed and became functional.

As long as the function of the above mentioned system is maintained, greater impacts from the projects and their components can be expected, through the coordination between the offices and other development partners. In this regard, it becomes more feasible that the four programmes proposed in the Master Plan can contribute to achieving the goal of livelihood improvement and improvement of living condition for the farmers in the division.

7.2 Lessons Learnt and Recommendations

The experiences, especially regarding project implementation and monitoring & evaluation by the offices during the last two years of the verification stages, can be useful lessons for future project management. Therefore, the implementation, continuation and expansion/replication of the proposed projects in the Master Plan should be carried out based on the lessons learnt and derived from the verification projects. After the Study, it is expected that The Gambian side utilize the Plan and implement the project components. However, there are several points to note in the implementation. Among the points, the five items concerning the Plan as a whole are dilated

below: 1) Provision of development opportunities; 2) Cooperation between development organizations at divisional level; 3) Promotion of frequent contacts between communities,;4) Management of efficient project implementation; and, 5) Role of the Central Government towards immediate implementation

1. Provision of development opportunities

Implementation of verification projects has characteristics of provision of development opportunities to the people who have eagerness for development. Some people could make good use of the development opportunity, while others could not do so much, and such results are related to the extension workers existence and ability. Thus, it is important for the extension workers to expand their coverage and to have their capacity enhanced in order to provide more development opportunities for farmers. Regular meetings, coordination skill and OJT training, frequent contact between extension workers and farmer, which were conducted during the verification projects, all played important roles in strengthening extension workers' capacity, as they got more confidence. Nonetheless, the extension workers should have continuous capacity building in order to achieve sustainable provision of development opportunities for both farmers and administration. In addition, it is necessary that the extension workers have at least a means of mobility for visiting farmers and an improved work environment including the operationalization of facilities of the divisional officers (such as electricity, or communication facilities).

2. Cooperation between development organizations at divisional level

Agriculture involves not only crop cultivation activities but encompasses multi dimensional factors, such as marketing or extension. In this regard,,, various projects are included in the Master Plan and require support from various organizations to ensure their smooth implementation. Various organizations and stakeholders including DAS, DES, DLS, DLO, Divisional government, Commissioner, CBOs, and NGOs were involved in implementing the verification projects, and horizontal cooperation among organizations in the agricultural sector was observed in URD. The Project management Unit (PMU), which is composed mainly of personnel from each of the organizations, can be regarded as one of the symbolic achievement of horizontal cooperation at divisional level. Such horizontal cooperation is essential for promoting decentralization in the division, where information and human resources are limited and it should be continued.

3. Promotion of frequent contacts between communities

Evidently, contact between communities is not very frequent in the region. However, with active intervention through extension workers, it was observed that farmers got stimulated and projects expanded. Useful techniques are accumulated in human resources in the region and it could be extended through mutual information exchange. It is expected that the information including useful techniques will be exchanged further among villages by referring to this Study. As can be seen, the roles of Village Extension Workers (VEWs) and Livestock Assistances (LAs) are important in promoting and facilitating smooth exchanges.

4. Management for efficient implementation

There exist many facilities, such as cereal bank, LADEP facilities, fence, wells in URD, which were built by NGOs and other organizations, but few of them are used efficiently. It is more economic to use existing facilities rather than to build new ones. Efficient management and operations of those facilities are essential for optimal usage, however farmers in URD are generally weak in this area. Consequently capacity development of farmers, DAS, and DLS, which was encouraged through the verification project, is encouraged to be continued.

5. Role of the Central Government towards immediate implementation

Through the Study, it was observed that the division even though located the furthest can hold the possibility of sustainable agricultural development. It is also confirmed that the government support is indispensable especially at the beginning of the project implementation. The following components were identified as the priority projects which are to be implemented in the earlier stage of the Master Plan period of 10 years. DOSA and its divisional arms have to take immediate action for the realization of the implementation of priority projects at the divisional level and also for reflection on the contents of the Plan to the forthcoming URD's divisional development plan.

Priority Components	The related verification projects
1) Farming Practice Improvement	Groundnut & Vegetables
2) Promotion of NERICA	NERICA
3) Compost Farming	Vegetables
4) Improvement of Small Ruminant Production	Groundnut & Vegetables
5) Animal Traction for Women	Groundnut
6) Small Scale Food Processing/Preservation	Vegetables
7) Training on Livestock Management and Disease Control	Coordination Skill Development

8) Coordination Skill Development at Divisional Level	Coordination Skill Development
9) Agriculture and Market Database	Coordination Skill Development

In the course of formulating the Master Plan, special attention was given to easiness of project implementation. Therefore, any development organizations in the division can make use of the Plan and implement its proposed projects in a manner appropriate to them. Both the divisional offices of DAS and DLS have enough extension centers which are dispersed in the division. Through the verification projects, it is observed and assured that the project implementation and expansion can be promoted by involving not only the offices at Basse, but also these centers. Along the recent policy of decentralization, this Study also stresses the importance of project implementation at divisional level. In this regard, "Project Implementation Manual" was developed for stakeholders in URD, especially the extension workers working at the frontline of community development. This manual is to be provided to and fully utilized by Area Council, Ward Development Committee, MDFT and also NGO/CBO in action within the division.

Besides the above mentioned general recommendations, specific recommendations for each verification project and other related projects on the Master Plan are shown in the following. Continuous implementation of verification projects conducted during the Study is critical for implementing the Master Plan smoothly, and it is important to undertake follow-up actions and support for them if necessary. The following indicates the recommendations together with that of chapter 6.

6. Groundnut production Improvement Project

The groundnut production improvement project contributed to reduce the workload of women, and it was especially efficient in remote rural villages. In such remote rural villages, extension service is rarely accessible and there is few provision of animal traction, and therefore women undertake all the cultivation operations themselves without using animal power and consequently manage smaller farm sizes. It is evidenced that providing training on animal traction and provision with the appropriate equipments contributed in enlarging the farm sizes of beneficiaries. As this is an important element in reducing the work load as well as ensure secure income sources for women in The Gambia; this project should be encouraged by the government. In this regard, equipments and donkeys provided by the project should be of appropriate quality and in good state of health, and it is important to have beneficiaries to participate in arranging identification and purchase of such inputs as much as possible, from the view

point of project sustainability. In addition, the Department of Agricultural Services (DAS) should coordinate effectively by making available extension workers so that they can provide technical advice to the farmers especially at the initial stage of the project.

7. Vegetable Production, Processing and Preservation Project

During the implementation of the vegetable verification project, farmers consumed more vegetables both in quantity and variety, which will contribute in improving their nutrition status, provided that the production is carried out smoothly. In addition, agricultural support for women contributed in increasing their production and income. Though nutrition improvement was emphasized in the vegetable verification project in the Study, it also encouraged the shift in focus to income enhancement through the marketing of their fresh and processed products. Overall, in order to achieve sustainable development, it is inevitable to provide holistic support to production, small scale processing and preservation, marketing, together with bookkeeping and literacy education.

Regarding each of the verification villages, that experience insect damage, it is essential to plant early, to stagger their cultivation period considering market glut, and to cultivate more local products rather than exotic ones. For the village where consumption of production is within the villages, it is recommended to produce more not only for self-consumption but also for selling at local markets. For the villages that sell their production to the outside, it is encouraged to form vegetable production groups, purchase equipments jointly, sell the products together, process and preserve the products, mutually exchange information, and ultimately organize vegetable marketing cooperatives.

8. NERICA Trial and Extension Planning

The NERICA verification project has proved that NERICA have potential to be broadly disseminated not only in the division but also to the whole country. However, the National NERICA project, which is supposed to be implemented by The Gambia government with AfDB/WARDA support has been delayed, and that the extension of NERICA to the whole country would take more time. In addition, there is not enough **physical** and technical support, and such support can be regarded as an essential element. Moreover, the purity of NERICA seeds currently being promoted by extension is not satisfactory enough. For the sustainable dissemination and promotion of this potential variety, prompt countermeasures should be carried out by NARI and DAS.

9. Coordination Skill Development Programme

During the formulation of the Master plan and implementation of the verification projects,

counterpart staff improved their technical ability and motivation for work. For example, they prepared reports for DCC and published newsletters; conducted regular meetings; and, exchanged information with farmers more frequently. With regard to the newsletters publication, the central government is trying to extend the work nationwide and it has broad development potential. By continuing the project, the involved personnel including counterpart can have higher motivation, and can be assured of positive contribution to further development and smooth implementation of several projects.