



REPUBLIC OF GHANA

MEDIUM TERM AGRICULTURE SECTOR INVESTMENT PLAN (METASIP)

2011 - 2015



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Foreword

The agriculture sector is key to overall economic growth and development of Ghana. In the national development agenda, agriculture is expected to lead the growth and structural transformation of the economy and maximize the benefits of accelerated growth. Significant improvements in the productivity of the agriculture sector are required to raise the average real incomes of Ghanaians as a whole. The agriculture sector also has direct impact on the attainment of at least five of the Millennium Development Goals (MDGs).

The Ministry of Food and Agriculture (MOFA) is the lead agency responsible for the agriculture sector within the context of a coordinated Government Programme. To carry out its function, plans and programmes are coordinated through policy and strategy frameworks. In this regard, MOFA facilitated the preparation of the Food and Agriculture Sector Development Policy (FASDEP II) and the Medium Term Agriculture Sector Investment Plan (METASIP). The FASDEP II states the long term policy objectives of government in relation to the development of the agriculture sector aimed at ensuring that the sector's stakeholders are best positioned to take advantage of the emerging opportunities.

The METASIP is the investment plan to implement the medium term (2011-2015) programmes of the policy. It has been developed to achieve a target agricultural GDP growth of at least 6% annually, halving poverty by 2015 in consonance with MDG 1 and based on government expenditure allocation in the national budget of at least 10% within the Plan's period (2011–2015). The METASIP is consistent with the ECOWAS Agriculture Policy and NEPAD's Comprehensive Africa Agriculture Development Programme (ECOWAP/CAADP) which provide an integrated framework to support agricultural growth, rural development and food security in the African region.

The METASIP, a result of a consultative, technical and budgetary process, identifies results and resource requirements and roles that the stakeholders in the sector will play in its implementation. It takes into account ongoing projects and will adopt the Sector-Wide Approach (SWAp) in its implementation bringing on board sector stakeholders in effective coordination and participation.

Greater involvement of the private sector is planned for the growth and development of the sector and its transformation in service delivery, as well as investment and management of the sector as a whole. A second level of stakeholder participation is that between MOFA and other Ministries, Departments and Agencies (MDA's) whose policies impact on the agricultural sector. A third level of participation relates to service delivery to smallholders, especially the poor, by reducing transaction costs. Various types of linkages are outlined to be established between smallholders and agribusiness, to facilitate access to input, research, technology and product markets, as well as other essential services. Agricultural sector policies are supported with technical and financial assistance from development partners and financial institutions and this forms a fourth level of participation. A key aspect of the objective of coordination of stakeholder participation is the harmonisation of actions of government and partners for synergy of operations and maximum results for accelerated growth.

At the decentralized levels, programmes and activities have been prioritized according to the

relative needs, importance and competitive advantage of the respective regions and districts. This will inform decentralized level planning, budget determination and contributions by stakeholders.

Through cooperation, coordination and commitment of all sector stakeholders (MDAs, Private Sector, including Farmers, Processors, Traders, NGOs, Traditional Rulers and Civil Society, Development Partners, among others), who signed the Ghana CAADP Compact in October 2009, the country can overcome most of the challenges facing the food and agriculture sector to enhance growth, create employment, increase incomes, reduce poverty and achieve food security for its people within the context of an environmentally sustainable and transformed rural economy.

A handwritten signature in black ink, appearing to be 'Kwesi Ahoi', written in a cursive style.

HON. MINISTER FOR FOOD AND AGRICULTURE
KWESIAHWOI

List of Acronyms

ADB	Agricultural Development Bank
AfDB	African Development Bank
AEA	Agricultural Extension Agent
AESD	Agricultural Engineering Services Directorate
AgGDP	Agriculture Gross Domestic Product
AgSSIP	Agricultural Services Sub-sector Investment Programme
AMA	Accra Metropolitan Assembly
APD	Animal Production Directorate
APF	Africa Partnership Forum
APFOG	Apex Farmers Organisation of Ghana
APR	Annual Progress Report
ARI	Animal Research Institute
ASWG	Agriculture Sector Working Group
AU	African Union
BNARI	Biotechnology and Nuclear Agriculture Research Institute
BOG	Bank of Ghana
BOPP	Benso Oil Palm Plantation
CAADP	Comprehensive African Agricultural Development Programme
CAHWs	Community Animal Health Workers
CARGS	Competitive Agricultural Research Grant Scheme
CBFMC	Community Based Fisheries Management Committee
CEPS	Customs Excise and Preventive Service
CFSVA	Comprehensive Food Security and Vulnerability Analysis
CGE	Computable General Equilibrium
CGIAR	Consultative Group for International Agricultural Research
CGS	Competitive Grants Scheme
CLWs	Community Livestock Workers
COCOBOD	Cocoa Board
CSD	Crop Services Directorate
CSIR	Council for Scientific and Industrial Research
DADU	District Agricultural Development Unit
DAES	Directorate of Agricultural Extension Services
DCGE Model	Dynamic Computable General Equilibrium Model
DOF	Directorate of Fisheries
DPO	Development Policy Operation
DPs	Development Partners
DVD	Digital Video Disc
ECOWAP	ECOWAS Agricultural Policy
ECOWAS	Economic Community of West African States
EDIF	Export Development and Investment Fund
EEZ	Exclusive Economic Zone
EMQAP	Export Marketing and Quality Awareness Project
EPA	Environmental Protection Agency
FABS	Food and Agriculture Budget Support
FAGE	Federation of Association of Ghanaian Exporters
FAO	Food and Agriculture Organization of United Nations

FARA	Forum for Agricultural Research in Africa
FASDEP	Food and Agriculture Sector Development Policy
FBO	Farmer Based Organization
FC	Fisheries Commission
FFA	Fish Farmers' Association
FFS	Farmer Field School
FOODSPAN	Food Security and Advocacy Network
FONG	Farmers Organisation Network in Ghana
FRI	Food Research Institute
GAEC	Ghana Atomic Energy Commission
GAPs	Good Agricultural Practices
GAFSP	Global Agriculture and Food Security Programme
GAWU	Ghana Agricultural Workers Union
GDP	Gross Domestic Product
GEPC	Ghana Export Promotion Council
GES	Ghana Education Service
GHS	Ghana Health Service
GIDA	Ghana Irrigation Development Authority
GIMPA	Ghana Institute of Management and Public Administration
GLSS V	Ghana Living Standards Survey V
GMPs	Good Manufacturing Practices
GNAFF	Ghana National Association of Farmers and Fishermen
GoG	Government of Ghana
GOPDC	Ghana Oil Palm Development Company
GPRS I	Ghana Poverty Reduction Strategy I
GPRS II	Growth and Poverty Reduction Strategy II
GRATIS	Ghana Regional Appropriate Technology and Industrial Service
GREL	Ghana Rubber Estate Limited
GSB	Ghana Standard Board
GSGDA	Ghana Shared Growth and Development Agenda
GSS	Ghana Statistical Service
GSSP	Ghana Strategy Support Programme
GTZ	Gesellschaft für Technische Zusammenarbeit (German Technical Development Agency)
Ha	Hectare
HACCP	Hazard Analysis and Critical Control Point
HIV/AIDS	Human Immune Virus/Acquired Immune Deficiency Syndrome
HRDM	Human Resource Development and Management
ICPM	Integrated Crop Pest Management
ICT	Information and Communication Technology
IDAF	International Development of Artisanal Fisheries
IEC	Information Education Campaign
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IGF	Internally Generated Fund
IMT	Intermediate Means of Transport
ISSER	Institute of Statistical, Social and Economic Research
ITD	International Trade Desk
ITTU	Intermediate Technology Transfer Unit

IWMI	International Water Management Institute
LAP	Land Administration Project
LPIU	Livestock Planning and Information Unit
M&E	Monitoring and Evaluation
MDAs	Ministries, Departments and Agencies
MDBS	Multi Donor Budget Support
MDGs	Millennium Development Goals
METASIP	Medium Term Agriculture Sector Investment Plan
MiDA	Millennium Development Authority
MLF	Ministry of Lands and Forestry
MLGRD	Ministry of Local Government and Rural Development
MMDAs	Metropolitan, Municipal and District Assemblies
MOAP	Market Oriented Agriculture Programme
MOE	Ministry of Education
MOFA	Ministry of Food and Agriculture
MOH	Ministry of Health
MOI	Ministry of Information
MOTI	Ministry of Trade & Industries
MOU	Memorandum of Understanding
MRT	Ministry of Roads and Transport
Mt	Metric Tonne
MTEF	Medium Term Expenditure Framework
NAAC	National Agricultural Advisory Committee
NADMO	National Disaster Management Organisation
NAFCO	National Food Buffer Stock Company
NARS	National Agricultural Research System
NBSSI	National Board for Small Scale Industries
NDPC	National Development Planning Commission
ND	Newcastle Disease
NEPAD	New Partnership for Africa's Development
NGOs	Non-Governmental Organizations
NOPL	Norwegian Oil Palm Limited
NR	Northern Region
NRGP	Northern Rural Growth Programme
OECD	Organisation for Economic Cooperation and Development
OIE	World Organisation for Animal Health
OPRI	Oil Palm Research Institute
PANVAC	Pan African Vaccine Centre
PEF	Private Enterprise Foundation
PEIR	Public Expenditure and Institutional Review
POCC	Potential, Opportunities, Constraints and Challenges
PPME	Policy, Planning, Monitoring and Evaluation
PPMED	Policy, Planning, Monitoring and Evaluation Directorate
PPP	Public Private Partnership
PPRSD	Plant Protection and Regulatory Services Directorate
PSIA	Poverty and Social Impact Analysis
RADU	Regional Agricultural Development Unit
REC	Regional Economic Community
RELCs	Research Extension Liaison Committees

ReSAKSS	Regional Strategic Analysis and Knowledge Support System
SAKSS	Strategic Analysis and Knowledge Support System
SEA	Strategic Environmental Assessment
SLM	Sustainable Land Management
SMEs	Small and Medium Scale Enterprises
SPS	Sanitary and Phytosanitary
SRID	Statistics, Research and Information Directorate
SWAp	Sector Wide Approach
TFP	Total Factor Productivity
TOPP	Twifo Oil Palm Plantation
TOR	Terms of Reference
TIPCEE	Trade and Investment Programme for a Competitive Export Economy
UER	Upper East Region
UPA	Urban and Peri-urban Agriculture
USAID	United States Agency for International Development
UWR	Upper West Region
VSD	Veterinary Services Directorate
WAAPP	West Africa Agricultural Productivity Programme
WECARD/CORAF	West and Central Africa Council for Agricultural Research and Development/Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles
WFP	World Food Programme
WHO	World Health Organisation
WIAD	Women in Agricultural Development
WTO	World Trade Organisation

Executive Summary

The Plan

The Medium Term Agriculture Sector Investment Plan (METASIP), 2011–2015 has been developed using a largely participatory process and based on FASDEP II objectives with a target for agriculture sector GDP growth of at least 6% annually and government expenditure allocation of at least 10% of the national budget within the plan period. These targets are in conformity with agricultural performance targets of the Ghana Shared Growth and Development Agenda (GSGDA), the ECOWAP of ECOWAS and the CAADP of NEPAD and are expected to contribute significantly to the achievement of the MDGs of the United Nations.

As a sector investment plan, emphasis throughout the Plan has been on concerted consultations and actions by all stakeholders of the sector. The key stakeholders include MOFA, other agriculture related MDAs, DPs, NGOs, academia, civil society, farmers and other on-farm and off-farm private sector operators, researchers and service providers.

Agriculture continues to be the largest sector of Ghana's economy, contributing in recent years (2000-2008) an average of about 39% of GDP compared to about 26% for the industry sector and 31% for the services sector. Arable and industrial crop production has increased marginally over the last 10 years with the only exception being cocoa which increased significantly between 2000 and 2005. Cotton and coffee production declined very significantly in the last decade. Available information on the livestock sub-sector indicates that the country's meat situation is in deficit to the tune of over 95,000Mt annually. Similarly, a deficit of about 460,000 Mt is recorded for fish.

The identified basic problems of the agriculture sector include: reliance on rainfed agriculture and low level and low performing irrigated agriculture; low level of mechanization in production and processing; high post harvest losses as a result of poor post harvest management; low level and ineffective agricultural finance; poor extension services as a result of several institutional and structural inefficiencies; inadequate markets and processing facilities; low performing breeds of livestock; poor feeding of livestock; high cost of feed for poultry; poor livestock housing and husbandry management; competition from imports and poor post-production management of livestock products; over-fishing of natural water bodies; undeveloped fish value chain and inadequate skills in aquaculture. Strategies in the Plan to improve agricultural performance in contribution to the vision (for a modernised agriculture, structurally transformed economy, food security, employment opportunities and poverty reduction), focus on investments to address sector constraints on productivity, market access, sustainable production and institutional coordination.

The six Programmes of the Plan which correspond to the six FASDEP II objectives have each been presented along development themes termed Components. POCC analysis was applied to the development issues of the themes to derive outputs and activities.

It is envisaged that the Plan will be implemented through existing structures in the MDAs and other stakeholder organizations and that the Policy Coordinating and Monitoring Unit of the Office of the President and the NDPC will play key oversight roles during implementation. MOFA will play the lead role in coordinating partnerships at all levels and in the monitoring and evaluation of the Plan.

Cost Estimates

Implementation of the plan to reach the goals set for the agriculture sector requires a significant financial commitment from the public sector. The cost estimates for implementing METASIP are public sector expenditure to be incurred above existing commitments to recurrent and investment costs for ongoing programmes. They do not include operational costs such as personal emoluments and administration of the implementing agencies.

The costing structure corresponds to the hierarchy of programmes, components, sub components and activities, providing clear analytical links from the principal goal for the agriculture sector to objectives for the six programmes, to expected outcomes for activities and to inputs. The cost estimates for the investment plan are indicative; precise estimates can become available only when detailed plans and feasibility studies for projects and programmes are completed.

The estimated incremental cost of implementation for all six programmes of the agriculture sector investment plan for both MOFA and other agriculture related MDAs for the five years is GHC 1,532.4 million. The Table below summarises the METASIP expenditure estimates by programmes and components.

METASIP Expenditure Estimates (GHC million, constant 2010 prices)

Programme/ Component		Year					Total
		2011	2012	2013	2014	2015	
Programme 1: Food Security and Emergency Preparedness							
1.1	Productivity Improvement	33.3	72.2	14.5	14.0	2.1	136.1
1.2	Support to Improved Nutrition	2.3	4.2	4.2	0.2	0.2	11.1
1.3	Support for Diversification of Livelihood Options for the Poor with off-farm activities linked to Agriculture	2.2	7.3	6.5	5.5	0.5	22.0
1.4	Food Storage and Distribution	0.1	0.4	0.7	0.3	0.0	1.4
1.5	Early Warning Systems and Emergency Preparedness	3.4	1.3	1.3	1.3	1.3	8.7
1.6	Irrigation and Water Management	11.1	64.9	85.0	103.6	21.6	286.2
1.7	Mechanization Services	20.0	20.0	20.0	20.0	20.0	100.0
Total Programme 1		72.3	170.4	132.3	144.9	45.6	565.6
Programme 2: Increased Growth in Incomes							
2.1	Promotion of Cash Crop, Livestock and Fish Production for income in all ecological zones	53.2	43.8	52.6	22.7	12.9	185.1
2.2	Development of New Products	2.1	2.0	2.0	2.0	2.0	10.2
2.3	Development of Pilot Value Chains for Two Selected Commodities in Each Agro-Ecological Zones	40.7	40.5	40.5	40.4	40.3	202.4
2.4	Intensification of FBOs and Out-grower Concepts	1.5	1.5	0.9	0.2	0.2	4.3
2.5	Development of Rural Infrastructure	94.9	96.6	86.4	86.4	86.2	450.3
2.6	Support to Urban and Peri-Urban Agriculture	0.3	0.3	0.2	0.2	0.2	1.4
Total Programme 2		192.6	184.8	182.6	151.8	141.8	853.70
Programme 3: Increased Competitiveness and Enhanced Integration into Domestic and International Markets							
3.1	Marketing of Ghanaian Produce in Domestic and International Markets	5.3	4.7	4.6	4.6	4.5	23.6
Total Programme 3		5.3	4.7	4.6	4.6	4.5	23.6
Programme 4: Sustainable Management of Land and Environment							
4.1	Awareness Creation and Use of SLM Technologies by Men and Women Farmers	1.6	6.8	6.6	6.5	6.5	27.9
Total Programme 4		1.6	6.8	6.6	6.5	6.5	27.9
Programme 5: Science and Technology as Applied in Food and Agricultural Development							
5.1	Uptake of Technology along the Value Chain and Application of Biotechnology in Agriculture	0.4	0.5	0.6	0.3	0.3	2.1

5.2	Agricultural Research Funding and Management of Agricultural Research Information						
		10.0	10.0	10.0	10.0	10.0	40.0
Total Programme 5		10.4	10.5	10.6	10.3	10.3	52.1
Programme 6: Improved Institutional Coordination							
6.1	Institutional Strengthening and Intra-ministerial Coordination						
		0.2	0.3	2.4	0.3	0.4	3.6
6.2	Inter-ministerial Coordination	0.2	0.3	0.2	0.3	0.2	1.2
6.3	Partnership with Private Sector and Civil Society Organizations						
		1.0	0.5	0.5	0.5	0.5	3.0
6.4	Coordination with Development Partners	0.7	0.3	0.3	0.2	0.2	1.8
Total Programme 6		2.1	1.3	3.4	1.3	1.4	9.6
Total METASIP		284.3	378.5	340.1	319.4	210.1	1,532.4

Achievement of the full potential impacts of the METASIP will require expenditure additional to these estimates, in a range of areas. Investment in infrastructure such as power, water and communications will be needed to ensure efficient operations of the private sector within the Government's market-oriented policy stance. It is expected that the private sector will be the main investors and that NGOs and civil society will play their expected roles during Plan implementation.

Funding Sources

The Government intends meeting the costs of METASIP through domestic and international sources. The Government is committed to increase its spending on agriculture development to reach the target of 10 per cent of its total budget, as agreed in the Maputo Declaration. Domestic sources include (i) increased budget allocation from the Government; (ii) recovery of costs from parts of the investment of METASIP; and (iii) other internally generated funds.

The Government in the 2009 fiscal year spent GHC 781.4 million on the agriculture sector, which represented 9.0 per cent of its total spending. Lifting the proportion of its spending to agriculture to 10 per cent would therefore require an increase of about 10 per cent over the 2009 figure. Government expenditure on four categories of (i) agriculture (crops and livestock), (ii) fisheries, (iii) agriculture-related research and (iv) feeder roads (roads to farm areas) in 2009 was GHC 630.0 million. The scope of these four categories corresponds closely to that of METASIP. A 10 per cent increase in Government expenditure on the agriculture sector “across the board” would thus result in an additional GHC 63.0 million being made available annually for METASIP. This base allocation of additional funds for METASIP for 2009 is assumed to grow at 6% annually.

METASIP proposes spending very significant amounts on private/ public partnerships to reduce the cost of capital and stimulate market-oriented investments. Government investment would be recovered, at least in part, from the private sector partners who would include FBOs. The volume of outlays to be recovered will be determined as agreements are reached with private sector partners. The investments concerned would include development of facilities for agribusiness in storage and processing (to cost about GHC 200 million) and equipment for mechanization services to be operated by entrepreneurs and FBOs (to cost about GHC 100 million). Assuming that cost recovery runs at 30 per cent of the total in the first year after investment and at 20 per cent in each of the next two years (thus averaging 70 per cent of all outlays), the Government would recover about GHC 132 million from its partners within the life of METASIP.

MOFA recovers costs of providing goods and services as “internally generated funds (IGF)” which currently run at some GHC 5 million per year. An assumption that IGF will increase in proportion to the increase in expenditure resulting from METASIP is suitably conservative. METASIP would add, on average, about 30 per cent to MOFA spending, suggesting that IGF would rise by about GHC 1.5 million annually from 2011.

Likely sources of funds and the commitment to METASIP are shown in the Table below. It is estimated that the funding gap for the investment programme is about GHC 1,016 million.

METASIP Funding Proposal (GHC million)

Source	Year					Total
	2011	2012	2013	2014	2015	
Government of Ghana Increased Allocation	66.8	70.8	75.0	79.5	84.3	376.4
Cost Recovery: Private/ Public Partnerships		18.0	30.0	42.0	42.0	132.0
Other Internally Generated Fund	1.5	1.6	1.7	1.8	1.9	8.5
Total Funds from Domestic Sources	68.3	90.4	106.7	123.3	128.2	516.9
Estimated METASIP Cost	284.3	378.5	340.1	319.4	210.1	1532.4
Funding Gap	216.0	288.1	233.4	196.1	81.9	1015.5

Priority Investments

A set of priorities is drawn from the overall investment plan. Highest priority is given to actions which directly impact farm production to achieve the objectives of Programmes 1 and 2 and the outcomes of their components. Only those activities in Programmes 3, 4, 5 and 6 considered urgent to support Programmes 1 and 2 are included in the priority investment plan. The priority investments and their tentative cost estimates are listed by programme and component in the Table below. The listing is to show priority thematic areas and subjects for consideration by DPs and the Government. In practice, packaging of projects and programmes would result in the combination of some of activities and the inclusion of activities listed in other parts of METASIP.

Priority Investments (GHC million)

		Year					Total
		2011	2012	2013	2014	2015	
Programme 1: Food Security and Emergency Preparedness							
1.1	Productivity Improvement	19.1	18.2	2.4	0.4	0.4	40.5
1.2	Support to Improved Nutrition	4.0	4.0	2.0	0	0	10.0
1.3	Support for Diversification of Livelihood Options for the Poor with Off-farm Activities Linked to Agriculture	2.2	7.2	6.2	5.2	0.2	21.0
1.5	Early Warning Systems and Emergency Preparedness	1.0	2.3	0.3	0.3	0.3	4.2
1.6	Irrigation and Water Management	8.0	51.0	53.0	69.0	27.0	208.0
1.7	Mechanization Services	20.0	20.0	20.0	20.0	20.0	100.0
Total Programme 1		54.3	102.7	83.9	94.9	47.9	383.7
Programme 2: Increased Growth in Incomes							
2.1	Promotion of Cash Crop, Livestock and Fish Production for income in all ecological zones	45.0	30.0	35.0	15.3	0.5	125.8
2.3	Development of Pilot Value Chain for Two selected Commodities in each Agro-Ecological Zones	40.0	40.0	40.0	40.0	40.0	200.0
Total Programme 2		85.0	70.0	75.0	55.3	40.5	325.7
Programme 4: Sustainable Management of Land and Environment							
4.1	Awareness Creation and Use of SLM Technologies by Men and Women Farmers	1.2	6.6	6.0	5.8	5.4	25.0
Total Programme 4		1.2	6.6	6.0	5.8	5.4	25.0
Programme 5: Science and Technology Applied in Food and Agricultural Development							
5.1	Uptake of Technology along the Value Chain and Application of Biotechnology in Agriculture	10.0	10.0	10.0	10.0	10.0	50.0
Total Programme 5		10.0	10.0	10.0	10.0	10.0	50.0
Total METASIP Priority Investments		150.5	189.3	181.9	166.0	96.8	784.5

Chapter 1

BACKGROUND AND CONTEXT

1.1 Rationale for a Sector Plan

Ghana's economy has been largely dependent on agriculture and its growth is key to overall economic growth and development. The first Ghana Poverty Reduction Strategy (GPRS I), 2003-2005 set out that agriculture was to be modernised to spur rural development. Similarly, in the Growth and Poverty Reduction Strategy (GPRS II), 2006-2009, and its sequel the Ghana Shared Growth and Development Agenda I (GSGDA), 2010-2013, agriculture is expected to lead the growth and structural transformation of the economy and maximize the benefits of accelerated growth. GRPS II recognized that no significant progress can be made in raising the average real incomes of Ghanaians as a whole without significant improvements in the productivity of the agriculture sector and agro-based/processing industry (NDPC, 2005).

The Ministry of Food and Agriculture (MOFA) as the lead ministry responsible for policy and planning for the agriculture sector has always responded to the national development initiatives with policies and strategies that address the sector's responsibilities in the national goals. Realising that the agriculture sector encompasses activities of several Ministries, Departments and Agencies (MDAs) as well as those of many non-governmental organizations and the private sector, MOFA has, as a matter of policy, involved all these agencies in policy formulation and implementation over the years. MOFA, with these stakeholders, in 2007 formulated the Food and Agriculture Sector Development Policy (FASDEP II). As the policy itself is a statement of intent, the next step towards the realisation of the policy objectives is the development of a Medium Term Agriculture Sector Investment Plan (METASIP) for the implementation of the broad strategies specified in the policy.

This Sector Plan has been developed based on a target agriculture sector GDP growth of at least 6% annually and government expenditure allocation of at least 10% within the Plan period (2011–2015). These are in conformity with national, regional and international agricultural performance targets.

1.2 The Process of Development of the Sector Plan

The approach to the development of the sector investment plan was both technical and consultative through technical committees and workshops for participation from a wide cross-section of sector stakeholders at the national, regional and district levels. A technical committee, consisting of MOFA and other MDAs, was inaugurated in July 2007. A stocktaking of sector programmes, strategies and performance from a historical perspective was carried out, concurrently with an analysis of options for agricultural sector growth. Value chain analysis of priority commodities, reports from commissioned studies as well as investment projects informed the analytical work. This was facilitated by MOFA with technical and financial support from the New Partnership for Africa's Development (NEPAD), the Economic Community of West African States (ECOWAS) and the Food and Agriculture Organisation (FAO) among others.

Stakeholder consultations were convened at the decentralised levels by Regional Directors of Agriculture and at the national and central levels by the Chief Director's office.

The stakeholder groups engaged, included sector related ministries, researchers, NGOs, private sector operators along the value chains (input suppliers, processors, traders, exporters, financial institutions, warehouses operators, transporters), academia, regional and district level officers. Criteria for stakeholder selection included a fair balance between the number of private and public sector participants, selection of farmers based on major commodities grown in the specific region (for regional consultations) and gender balance among participants. Reports were prepared on all stakeholder consultations at national, regional and district levels, as inputs into the process.

The above processes informed the preparation of a zero draft of the plan, which was further discussed by many more sector stakeholder groups including private sector, civil society organisations, Parliamentary Select Committee on Food, Agriculture and Cocoa Affairs and DPs. The final draft was the basis for the ECOWAS/CAADP compact signed in Ghana in October 2009. This draft was subjected to a technical review organised by ECOWAS, after which this final document was prepared.

1.3 Organization of the Document

The METASIP consists of 12 Chapters. This introductory Chapter concludes with three sections. The first presents the statement of the Vision, Mission, Goal and Objectives that guide the plan; the second describes how the plan goals and objectives are aligned with those of the national development plan and the pillars of CAADP; and the last section describes the scope of the plan. Chapter 2 provides a summary review of the performance of the agriculture sector, including trends in crop production and productivity, livestock and fish production, imports and exports of agricultural commodities, and nutrition levels. The section also discusses the constraints in the agricultural sector, as well as analysis of the potential and sources of growth.

Chapter 3 presents the six programmes of the METASIP, which have been organized along the six objectives of FASDEP II. The results framework and the cost evaluation and financing of the plan are presented in Chapters 4 and 5 respectively.

Recommendations from financial and economic analysis studies to inform the METASIP is presented in Chapter 6, while the Implementation Framework for the plan is presented in Chapter 7. Chapter 8 describes the policy implications of the plan, whilst Chapter 9 presents the safeguard measures adopted by the Plan.

The last three chapters present the results of the Institutional Assessment to inform implementation of the plan; the Monitoring and Evaluation Framework and Risk Assessment of the plan.

Working documents used in the development of the METASIP have been compiled separately. The documents include:

- A stocktaking report
- A computable general equilibrium (CGE) modeling report
- Stakeholder consultation reports
- Potential, Opportunities, Constraints and Challenges (POCC) Analyses
- Institutions and Roles to leverage skills and build on synergies

- Agriculture Sector M&E Indicator Matrix (2011-2015)
- Commodity Programmes
- Priority Roads for rehabilitation
- A matrix of infrastructural facilities to remove constraints to selected agricultural commodities
- Costing report

1.4 Vision and Objectives

1.4.1 Vision

The Vision for Ghana's Agriculture Sector is “**a modernised agriculture culminating in a structurally transformed economy and evident in food security, employment opportunities and reduced poverty**”.

1.4.2 FASDEP II Objectives

The strategic objectives for the agricultural policy (FASDEP II) are as given below. They also form the programme areas in this Sector Plan document.

- Food security and emergency preparedness
- Increased growth in incomes
- Increased competitiveness and enhanced integration into domestic and international markets
- Sustainable management of land and environment
- Science and technology applied in food and agriculture development
- Improved institutional coordination

1.5 Alignment with National and International Frameworks

According to the FASDEP II document, the “vision for the food and agriculture sector is linked to the national vision in GPRS II, NEPAD's CAADP and the MDGs” (MOFA, 2007 p.15). Both the GSGDA and the Comprehensive African Agricultural Development Programme (CAADP) framework have targets for agriculture sector performance that will contribute to the attainment of the broader goals. The GSGDA expects agriculture to spur industrial growth. Also, in the GSGDA the economy (non-oil) is expected to grow at 6.5% by 2010 and 8.2% by 2013. This level of growth demands higher growth performance than the average of 5.6% recorded over the 2000-2006. Agriculture growth target under CAADP is at least 6% and governments are urged to raise budgetary allocation to agriculture to at least 10%.

The ECOWAS Agricultural Policy (ECOWAP) and the CAADP of NEPAD are the key efforts with the overriding goal of helping African countries increase their economic growth through agriculture-based development, which eradicates hunger, reduces poverty and food and nutrition insecurity and makes it possible to increase exports. This goal is in close harmony with GSGDA I (2010-2013) and the FASDEP II.

1.6 Scope of the METASIP

The METASIP is a sector wide investment plan and includes activities of agriculture related Ministries, Departments and Agencies (MDAs) based on the classification of functions for the sector. It also anticipates activities of the private sector and civil society and takes into account ongoing projects. As a sector investment plan, emphasis throughout the Plan has been on concerted consultations and actions by all stakeholders of the sector. The key stakeholders include MOFA, other relevant MDAs, Development Partners (DPs), NGOs, academia, civil society, farmers and other on-farm and off-farm private sector operators, researchers and service providers.

The implementation of the METASIP adopts the application of a Sector-Wide Approach (SWAp) to bring on board sector stakeholders in effective coordination and participation. Extensive consultation with all stakeholders was undertaken at the central and decentralised levels for the preparation of the investment plan.

Chapter 2

REVIEW OF AGRICULTURE SECTOR PERFORMANCE

2.1 General Trends

Economic growth in Ghana has been quite impressive since 2000. There has been relative economic stability and indications are that income poverty has reduced in Accra and in the rural forest zone, especially among export crop farmers (ISSER, 2007). There are, however, indications of growing inequality between social groups, occupational groups and geographical areas in the country (Ibid). The situation points to structural problems that need to be addressed. Some of the structural problems relate to the dominant agriculture sector which is responsible for about 39% of Gross Domestic Product (GDP), provides employment to about 50.6% of the labour force (4.2 million people) and is the largest foreign exchange earner.

The general performance of the agriculture sector relative to other sectors since 2000 is as shown in Table 1. It shows that the sector has been and still is the largest contributor to GDP even though service is the fastest growing sector. While the average agriculture sector GDP growth rate between 2000 and 2008 has been about 4.7% that of the service sector has been about 6.0%. The faster growth in the service sector is not likely to drive agricultural growth significantly because of weak linkages between the two sectors in Ghana.

Table 1 : Share of Agriculture in Gross Domestic Product: 2000-2008

Year	Sector, (%)			
	Agriculture	Industry	Services	Other (Net Indirect Taxes)
2000	39.6	27.8	32.7	**
2001	39.6	27.4	33.0	**
2002	39.8	27.4	33.0	**
2003	38.8	24.9	29.8	6.5
2004	40.3	24.7	29.9	5.1
2005	39.5	25.1	30.0	5.4
2006	39.3	25.9	30.0	4.8
2007	38.0	25.7	31.2	5.1
2008	33.6	25.9	31.8	8.7
Average Sectoral shares in GDP (2000 – 2008)	38.7	26.1	31.3	5.9

Source: Ghana Statistical Service (GSS), 2008

2.2 Agricultural Production Trends

2.2.1 Crop Production

Areas planted to different crops have increased only marginally since 2000. Overall percentage increase in cultivated area between 2000 and 2008 is about 17.3% or an average of about 1.9% per year over the period (SRID, 2008). Overall increase in production of all arable crops between 2000 and 2008 is also about 41.1% or 4.6% per year over the period (SRID, 2008). Recent studies of the components of agricultural growth suggest that most agricultural growth has been mainly due to land area expansion as opposed to yield increases (Diao, 2005). A World Bank study has, however, indicated that total factor productivity (TFP) accounted for 60% of agricultural sector growth between 2001 and 2005 and some of that growth can be “traced to specific, productivity-enhancing measures and results in the cocoa sector” (World Bank, 2007). For example, while land for cocoa trees expanded at an annual 5% growth rate, it had a yield growth rate of 17%. While fibre crops declined in acreages it maintained an annual yield growth rate of 6%.

2.2.2 Industrial Crop Production and Exports

Ghana's industrial crops include cocoa, oil palm, cotton, sheanut, coffee, rubber and coconut. Table 2 clearly indicates the dominant role of cocoa and oil palm in the industrial crop sub-sector. The cocoa sub-sector experienced phenomenal growth between 2003 and 2005. The oil palm sub-sector has also been growing steadily. The rubber and coconut sub-sectors have also grown but only marginally. As indicated in Table 2, rubber production increased by 28.1% between 2000 and 2006 while coconut production increased by only 6.7% within the same period.

The production of cotton and coffee has however declined very significantly over the years. The seed cotton industry has had serious problems largely related to unguided liberalization of the sub-sector as well as the downturn in world market prices since the beginning of the new millennium. The indebtedness of cotton companies to the Agricultural Development Bank coupled with the influx of a large number of unproductive private cotton companies has brought the industry to a near collapse.

About 30,000 Mt of sheanuts were collected in 2000 and that increased to 105,000Mt in 2003 before falling again to 30,000Mt in 2005. The shea industry is currently largely unorganized partly because there are no sheanut farms. Shea trees are semi-wild and the nuts are gathered, mainly by women. At the moment the Ghana Cocoa Board oversees the sheanut industry but the industry has not shown any significant growth or development over the years. The research centre for shea in Bole has, for example, had no researcher for over 10 years. Virtually anybody can market and/or process sheanuts. That means there is hardly any control over standards. There is need for a Sheanut Development Board to develop the shea industry especially as it has the potential for poverty alleviation of the most marginalized, rural women, and the uplifting of the poorest and most deprived parts of the country, the Guinea and Sudan savannah areas.

Table 2 : Production of Industrial Crops (Mt)

Year	Cocoa (1)	Sheanut (1)	Seed Cotton (2)	Oil Palm (3)	Rubber (4)	Coconut (5)
2000	436,534	30,771	35,503	1,066,426	11,081	300,000
2001	389,591	19,882	17,506	1,586,500	9,784	300,000
2002	340,562	27,160	22,851	1,612,700	10,240	300,000
2003	496,846	105,000	16,822	1,640,100	10,924	300,000
2004	736,975	n.a.	20,155	1,686,800	12,347	316,000
2005	599,318	30,000	21,000	1,712,600	13,619	316,000
2006	740,458	n.a.	n.a.	1,737,900	14,196	320,000
2007	614,532	n.a.	n.a.	1,684,500	n.a.	n.a.
2008	680,800	n.a.	n.a.	1,219,260	n.a.	n.a.

Sources: 1. COCOBOD, 2. Agricultural Development Bank. 3. Oil Palm Companies (GOPDC, TOPP, BOPP, NOPL) and Individual Plantations. 4. GREL, Ghana Rubber Master Plan, 2007. 5. Estimates by Coconut Sector Development Project and Tree Crops Development Unit, MOFA.

The main agricultural exports of Ghana have been cocoa and timber and timber products. The contributions of cocoa and cocoa products to total merchandise exports have been very substantial, ranging from 20.5% in 2001 to 37.9% in 2004 (Bank of Ghana, 2006). There is presently a policy to increase the percentage of cocoa beans processed locally from about 18%-20% to 40%-50%. The percentage contribution of timber and timber products to total merchandise exports ranged from 6.8% in 2003 to 9.1% in previous years (Ibid).

The country has encouraged the export of other agricultural commodities over the years as a strategy to diversify exports. The main commodities have been pineapple, yam, banana, fish, cashew, mango, papaya and sheanut. The indication is that there is considerable potential for the export of non-traditional agricultural commodities and an enabling environment should be created for their production.

2.2.3 Horticultural Crops Production

Horticultural crops (fruits and vegetables) play a major role in food and nutrition security as they are not only sources of income but they are also good sources of vitamins, minerals and dietary fibre. Although FAO and WHO recommend a daily intake of at least 400g/person (146kg/person/year) of fruits and vegetables, Africa has been put on record as the least nourished of all the continents in the world with fruit and vegetable intake of 100g/day or lower compared to 300g/day for those in developed countries.

The horticulture industry is export-oriented and statistics on domestic production and trade are scanty. Only a small percentage of horticultural crop farmers are engaged in production for export. Table 3 presents production levels of major horticultural produce in 2008. There is need to improve on productivity and reduction of postharvest losses through improved harvesting and post harvest handling practices of horticultural crops. Consistent promotion of the regular

consumption of adequate amounts of varieties of fruits and vegetables would also improve nutrition and income generation.

Table 3 : Area and production of selected horticultural crops in Ghana:2008

Crop	Cropped Area (Ha)	Estimated Production (Mt)	Crop Yield (Mt/Ha)
Tomato	16,130	284,000	17.6
Pepper	9,570	134,000	14.0
Okra	2,330	46,600	20.0
Garden Eggs	3,870	38,700	10.0
Shallots	4,900	39,300	8.0
Citrus	15,700	550,000	35.0
Mango	6,360	70,000	11.0
Pineapple	8,000	400,000	50.0
Pawpaw	880	40,000	45.0

Source: MOFA (SRID), 2009

2.2.4 Livestock Production

The livestock sub-sector is dominated by small scale operators who are mainly crop farmers keeping livestock to supplement their incomes and/or for security purposes. There are few well-organized commercial poultry and pig operations.

There has been no livestock census for several decades and this has affected the credibility of livestock population statistics. MOFA has been relying on projections, which do not accurately portray the livestock situation. There is urgent need for a comprehensive livestock census and the institution of a livestock monitoring system thereafter to ensure that credible information on livestock is made available continuously.

According to available data, total domestic meat production increased from about 77,235 Mt in 2003 to 101,895 Mt in 2008 (Table 4a). That is about 132% increase over the period. Poultry contributed the greatest proportion of total domestic meat production followed by beef.

Table 4a : Domestic Meat Production: 2003-2008

Livestock/year	Domestic meat production, Mt						% by type
	2003	2004	2005	2006	2007	2008	
Cattle/Beef	18,486	18,686	18,874	19,140	19,346	19,553	21.7
Sheep/Mutton	13,568	14,004	14,450	14,913	15,390	15,831	16.7
Goats/Chevon	13,884	15,308	15,300	15,588	16,364	17,180	17.8
Pigs/Pork	10,181	9,979	9,744	16,027	16,498	17,002	15.1
Poultry/Chicken	21,116	22,982	22,709	27,224	29,630	32,249	29.6
Total	77,235	80,959	76,582	92,893	97,229	101,895	100.0

Sources: (i) MOFA (SRID), 2009 and (ii) Computations from livestock production data.

Available statistics on livestock imports cover dressed or processed livestock, dairy products and animals imported live for slaughter (Table 4b). It is estimated that a high percentage of cattle slaughtered annually are imported from the northern Sahelian countries in the West African sub-region.

Table 4b : Meat Imports into Ghana: 2003-2008, Mt

	2003	2004	2005	2006	2007	2008
Cattle/Beef	1,112	2,587	6,332	10,586	16,250	13,135
Sheep/Mutton	2,122	2,053	3,640	4,839	6,887	5,961
Goats/Chevon	NA	NA	NA	NA	NA	NA
Pigs/Pork	9,882	7,756	10,287	13,291	10,552	5,487
Poultry/Chicken	32,939	39,089	40,591	44,758	63,276	89,889
Total	46,055	51,485	60,850	73,474	96,965	114,472

Sources: MOFA, VSD.

Total meat available for domestic consumption in Ghana as at 2008 (domestic production and imports) amounted to 189,784 Mt, while FAO's recommended level for the whole population is 285,430 Mt/year. This leaves a deficit of 95,646 Mt. Pragmatic efforts are therefore needed to bridge this gap by increasing meat production and consumption.

2.2.5 Fish Production

Fish is consumed by most Ghanaians daily. It is recognized as the most important source of animal protein and it is expected to provide 60 percent of animal protein needs of consumers in all regions of the country. National per person fish consumption is estimated to average at 23 kg, much higher than the global average of 13 kg.

The country's total annual fish requirement is estimated at 880,000 Mt while annual production averages only 420,000 Mt (see Table 5), leaving an annual deficit of 460,000 tonnes (DOF, 2007). Part of this deficit is made up for, through fish imports which in 2007 was 212,945 Mt and valued at US\$262 million (DOF, 2007). The actual net deficit of 247,055 Mt is left unattended. Ghana is therefore not able to meet its national fish demand even with importation. With prospects for higher landings from the capture fisheries being limited due to dwindling stocks as a result of over exploitation of the resource, the net deficit is expected to worsen over time.

In 2002, the Ghana Statistical Service (GSS) estimated that about 2 million people depend on the fisheries sub-sector for livelihood. More specific estimates account for 110,000 small-scale fishers in the marine sector with many, mostly women, being involved in processing, marketing and ancillary activities. For Lake Volta, these figures are respectively, 71,000 small-scale fishers and 20,000 people involved in processing and marketing (IDAF, 1993).

Table 5 : Annual Fish Production by Source, Mt

	2002	2003	2004	2005	2006	2007	2008	Total (2002-08)	% by Source
Marine	290,000	331,412	352,405	322,790	323,619	290,706	343,962	2,254,894	79.5
Inland	88,000	75,450	79,000	82,654	83,168	84,757	87,096	580,125	20.5
Total	378,000	406,862	431,405	405,444	406,787	375,463	431,058	2,835,019	100.0

Source: MOFA (Fisheries Commission)

2.3 Food Consumption and Nutrition Trends

2.3.1 Levels of Food Consumption

The World Food Programme sponsored a Comprehensive Food Security and Vulnerability Analysis (CFSVA) in 2009, the first nationwide household food consumption survey in Ghana since 1977. This survey gives an indication of how foods are purchased or home produced and categorizes households based on their dietary patterns. Food consumption measurement reflects the diversity of the diet and the frequency staple and non-staple foods are consumed.

The survey results indicate that consumption of cereals and tubers is seven days across all regions, with consumption of fish, meat and fruit consumption varying substantially. While people living in the coastal zone eat fish more frequently, those in the savannah area consume meat two days per week on average. Maize and millet are the cereals most frequently consumed, followed by bread (wheat) and rice. The impact of wealth plays a key role in the frequency with which meat, fruit and oil are consumed by households. Households who are self-employed or with stable salary consume varied diet as compared with farming households or households engaged in unskilled labour (WFP, 2009).

The survey also showed that almost all the food products sold to consumers have very limited value addition. Cereals and grain legumes are only threshed, while roots and tubers and plantains are sold mostly in their raw form. Recent attempts to produce cassava, plantain and yam flour are yielding results but it will take time for markets to be created. Low income levels are also a source of restrained demand for the well packaged cassava, plantain and yam flour. It is pertinent to note that there are hardly any statistics on processed agricultural products in the country. A critical element of modernization of the agriculture sector is value addition to primary produce. Without reliable statistics on the supply of and demand for processed agricultural products, it will be difficult to convince investors to consider investing in agro-processing.

As indicated in Table 6, Ghana experiences deficits with regard to rice, maize, sorghum and millet. To make up for the shortfalls in cereal production some quantities of maize, rice and sorghum are imported. Ghana imports all its domestic requirements of wheat. Information from the Ministry of Trade and Industry indicates that wheat and rice have been the main cereal imports since 2000. Rice imports have consistently been the highest since 2001. Despite the efforts made in the production of rice, cost of production is high and it cannot compete with cheaper imported rice.

Significant quantities of livestock and livestock products are also imported to make up for production shortfalls. The main livestock product imported has been frozen chicken. Over 89,000 Mt of frozen chicken was imported in 2008 alone (VSD, 2009). Pork and beef imports have also been quite substantial. Over 5,000 Mt of pork and over 13,000 Mt of beef were imported in 2008 (Ibid). The massive importation of frozen chicken, just like rice, has adverse consequences on the local poultry industry. With the high cost of feed, poultry produced locally cannot compete with the imported poultry products.

Table 6 : Domestic Food Supply and Demand of Key Staples (2005 -2008), 000'Mt

Commodity	Total Domestic Production				Production Available for Human Consumption ¹				Estimated National Consumption ²				Deficit/Surplus			
	2005	2006	2007	2008	2005	2006	2007	2008	2005	2006	2007	2008	2005	2006	2007	2008
Maize	1,158.0	1,189.0	1,219.6	1,207.0	810.0	832.0	854.0	905.9	894.0	939.0	998.6	1,024.5	-84.0	-107.0	-144.9	-118.6
Rice (milled) ³	145.0	250.0	185.3	124.0	116.0	120.0	148.0	107.9	305.0	320.5	344.3	561.4	-189.0	-200.5	-196.0	-453.5
Millet	144.0	165.0	113.0	119.0	101.0	115.5	79.0	103.5	189.0	199.0	145.9	23.4	-88.0	-83.4	-66.8	80.1
Sorghum	287.0	315.0	154.8	163.0	201.0	220.5	108.0	141.8	311.0	327.1	230.3	11.7	-110.0	-106.6	-121.9	130.1
Cassava	9,739.0	9,638.0	10,217.9	10,321.0	6,817.0	6,746.6	7,153.0	7,224.7	3,186.0	3,346.0	3,486.1	3,576.3	3,632.0	3,400.6	3,666.4	3,648.4
Yam	3,892.0	4,288.0	4,376.0	4,490.0	3,114.0	3,430.4	3,501.0	3,592.0	890.0	934.8	955.3	980.0	2,224.0	2,495.6	2,545.5	2,612.0
Plantain	2,381.0	2,900.0	3,233.7	3,330.0	2,024.0	2,465.0	2,749.0	2,830.5	1,767.0	1,856.4	1,933.4	1,983.5	257.0	608.6	815.2	847.0
Cocoyam	1,716.0	1,660.0	1,609.1	1,746.0	1,373.0	1,328.0	1,352.0	1,658.7	1,178.0	1,237.6	1,301.9	1,335.6	195.0	90.4	50.2	323.1
Groundnut	390.0	520.0	301.8	314.0	332.0	442.0	257.0	282.6	421.0	265.2	273.6	280.7	-89.0	176.8	-17.1	1.9
Cowpea	141.0	167.0	119.0	127.0	120.0	141.9	101.0	108.0	19.0	110.5	114.0	117.0	101.0	31.5	-12.9	-9.0
Soybean	N/A	52.0	52.8	N/A	N/A	44.2	45.0	N/A	N/A	15.5	79.8	N/A	N/A	28.7	-34.9	N/A
Total	19,993.0	21,144.0	21,583.0	21,941.0	15,008.0	15,886.1	16,347.0	16,955.6	9,160.0	9,551.6	9,863.2	9,894.1	5,849.0	6,334.7	6,482.8	7,061.5

Source: MOFA (SRID)

¹ 70% of domestic production for maize and cassava, 87% for rice, millet and sorghum; 80% for yam; 95% for cocoyam; 90% for groundnuts; 85% for plantain and cowpea. Livestock feed, wastage and seed account for the discount

² Population estimated based on 2000 census figures and growth rate of 2.7% for 2005=21.6m, 2006=22.2m, 2007=22.8, 2008=23.39m

³ 60% of paddy rice

N/A – Data not Available

2.3.2 Nutrition Trends

The 2008 Ghana Demographic and Health Survey indicates that about 28% of Ghanaian children are stunted, 8.5% are wasted and 13.9% are underweight. All three indicators decreased between 2003 and 2008. In terms of regional distribution, the Northern, Upper East, Upper West and Central Regions continue to be the areas of high malnutrition. Stunting and underweight values are very high in these regions compared to the others.

Micronutrient malnutrition has been termed the “silent killer”. The consumption of inadequate amounts of iron, iodine and vitamin 'A', can cause serious disorders especially for women and children. The 2008 Ghana Demographic and Health Survey indicates that the prevalence of

anaemia in children has increased slightly from 76% in 2003 to 78% in 2008. Micronutrients are particularly important for pregnant and lactating women in ensuring proper development of the brain of the yet-to-be-born and breastfeeding children. Growing children also need to take adequate amounts of the nutrients to ensure normal growth.

The 2003 Demographic and Health Survey results show that 83.4% rural and 56.3% of urban Ghanaian households do not consume adequate iodine. The Northern, Upper East and Upper West Regions of Ghana have the highest incidence of iodine deficiency. Similarly, over 80% of children and about 48% of women are anaemic in rural Ghana. The figures for urban Ghana are 67.8% for children and 41.6% for women. The regions of the country that are most iron deficient include the Northern (82.5% for children), Western (80.1%), Upper East (79.1%), Ashanti (79.0%), Upper West (78.3%) and Central (76.8%). These figures indicate that children born in these areas grow with a lot of nutritional inadequacies retarding brain and body development. This has significant negative impact on human capital development and future growth of the economy.

2.4 Constraints to Agriculture Sector Development

Ghana's agriculture is dominated by small scale producers, with average farm size of about 1.2 hectares and low use of improved technology. Small farmers account for about 80% of domestic production. The country's agriculture is also characterized by low crop and animal productivity. Yields of most crops are generally low and as indicated in Table 7, they have remained almost constant between 2002 and 2008. Most yields are about 60% of achievable yields. Improvements in yields are possible and would be pursued.

A major reason for the non-attainment of achievable yields is low fertility of the soils which is partly due to low use of fertilizers. The average food crop producer is resource-poor and therefore uses little fertilizer, insecticides, high yielding varieties or irrigation-based cultivation. High prices of fertilizer contribute to the low use of the input in Sub-Sahara Africa and Ghana in particular. Fertilizer use in the country is about 5kg/ha, which is only half of the rate in the Sub-Saharan Africa which is also far less than in other developing countries. However, fertilizer use is generally profitable (IFPRI, 2007; FAO, 2005). Value cost ratios of fertiliser use range from 2.7 for maize, to 10 for irrigated rice (FAO, 2005), compared to a minimum acceptable ratio of 2.0. Yet estimates of crop nutrient balances (quantity removed less nutrient applied) are in deficit for all crops and reflect loss of potential yield and progressive soil impoverishment.

Table 7 : Average Yields of Selected Food Crop and Comparison with Achievable Yields, Mt/Ha

Crop	Yield							Average yield(2002–2008) (A)	Achievable Yield (B)	% of Achievable (A/B x 100)
	2002	2003	2004	2005	2006	2007	2008			
Roots and Tubers										
Cassava	12.3	12.7	12.4	12.8	12.2	12.8	13.5	12.7	28.0	45.3
Cocoyam	6.6	6.5	6.4	6.6	6.4	6.6	6.7	6.5	8.0	81.8
Yam	13.0	11.9	12.5	13.0	13.2	13.5	14.1	13.0	20.0	63.5
Sweet potato					8.0	8.1	8.1	8.0	18.0	45.2
Plantain	8.3	8.1	8.5	9.6	9.7	10.6	10.7	9.7	10.0	93.6
Cereals										
Maize	1.5	1.6	1.6	1.6	1.5	1.5	1.7	1.6	2.5	62.9
Millet	1.1	0.9	0.8	1.0	0.8	0.7	1.1	0.9	1.5	61.0
Sorghum	0.8	1.0	1.0	1.0	1.0	0.7	1.2	0.9	1.5	63.8
Rice (Paddy)	2.3	2.0	2.0	1.9	2.0	1.7	2.3	2.0	3.5	58.0
Legumes										
Cowpeas	n.a.	n.a.	n.a.	n.a.	0.8	0.9	1.1	0.9	1.25	74.7
Soybean	n.a.	n.a.	n.a.	n.a.	0.8	1.1	1.2	1.0	1.0	103.3
Groundnut	n.a.	n.a.	n.a.	n.a.	0.9	0.9	1.3	1.0	1.0	103.3
Others										
Pawpaw	n.a.	n.a.	n.a.	n.a.	25.0	25.0	25.0	26.0	40.0	62.5
Pineapple	n.a.	n.a.	n.a.	n.a.	60.0	60.0	60.0	65.0	100.0	60.0
Tomato (Rainfed)	n.a.	n.a.	n.a.	n.a.	25.0	25.0	25.0	25.0	35.0	71.4
Tomato (Irrigated)	n.a.	n.a.	n.a.	n.a.	30.0	30.0	30.0	30.0	65.0	46.2
Garden eggs	n.a.	n.a.	n.a.	n.a.	8.0	8.0	8.0	8.0	15.0	53.3
Pepper	n.a.	n.a.	n.a.	n.a.	6.5	12.1	12.4	10.3	15.0	68.9

Source: SRID, Calculations from 2002-2008 production data

Another major determinant of crop productivity is the use of improved seeds and planting material. Most farmers still reserve some of their produce to be used as seed even when they use improved seeds. It clearly indicates the lack of understanding of seed technology by farmers. For increase in productivity it is very necessary that certified seed production is intensified. Indeed, many farmers can be empowered to produce certified seed of various crops. Research has indicated that production of improved seed is not profitable because of farmer practices of recycling the seed (IFPRI, 2007). Use of insecticides and other disease preventing chemicals can also increase crop productivity. Their use by farmers in Ghana are however very minimal.

Inadequate data on virtually every sub-sector, especially livestock, is a major constrain to policy planning and must be tackled with seriousness. Inadequate agricultural finance and difficulties in accessing agricultural credit has also contributed very significantly to low agricultural productivity.

In summary, the low agricultural productivity in the country can be attributed to the following factors, among others: reliance on rain fed agriculture and the low level and low performing irrigated agriculture; low level of mechanization in production and processing; high post harvest losses as a result of poor post harvest management; low level and ineffective agricultural finance; poor extension services as a result of several institutional and structural inefficiencies; inadequate markets and processing facilities; low performing breeds of livestock; poor feeding of livestock; high cost of feed for poultry; poor livestock housing and husbandry management; competition from imports and poor post-production management of livestock products; over-fishing of natural water bodies; undeveloped fish value chain (e.g. inadequate supply systems for fingerlings and feed) and lack of skills in aquaculture.

The overall outcome of these constraints is a very slow rate of transformation of the agriculture sector with persistent low productivity and competitiveness in markets especially international markets. Strategies to improve agricultural performance should therefore include investments that improve productivity and enhance market access. These include rural infrastructure (production and post-production), upgrading skills of operators in the value chain, research to improve livestock breeds and crop varieties, market information, and appropriate policies to facilitate supply and access to productivity enhancing inputs.

2.5 Agricultural Finance, Implementation and Monitoring and Evaluation Situation

2.5.1 Agricultural Financing Situation

Investing in agriculture is key to achieving poverty reduction and food security in developing countries. Studies have shown that public spending provides leverage for other investments. Ghana Government expenditure on agriculture decreased from 12.2% of its budget in 1980 to 4.1% in 1990 when subsidies for agriculture were phased out. Since the late 1990s, the share of government expenditure going through the MOFA has been less than 2%. If, however, the expenditure of the cocoa sector is added it raises it considerably to about 5%.

The distribution of MOFA's expenditure has historically been biased towards recurrent expenditure. However, the share of development expenditure has been increasing from about the year 2000. It increased from about 30-35% in the period 1990-2000 to about 46% in 2005-2006. The Government of Ghana (GoG) has been striving to achieve the Maputo Declaration of allocating at least 10% of annual government expenditure to the agricultural sector. The share of government expenditure in the sector has risen from 2.4% in 2001 to 9% of total spending in the 2009 fiscal year.

The agriculture sector is dominated by private sector activity therefore it is expected that much of the investment in the sector will be led by the private sector. These operators in the agricultural sector, in addition to equity funds, source funds from formal and informal financial institutions to finance their activities. Funds from informal sources, such as money lenders, traders and rotating credit associations, tend to be small with limited scope and are short-term. However, informal sources are more easily accessible than formal financial institutions. Allocation of credit to agriculture from the formal financial institutions has been on the decline since 1998; it fell from levels close to 20% that prevailed prior to the financial sector reforms of the late 1980s and since 2000, allocation to agriculture has been below 10%, falling to just above 6% in 2006.

Foreign direct investment is another source of finance to the agricultural sector; but this has been

very low. Data from the Ghana Investment Promotion Centre (GIPC, 2007) show that not only has the number of agricultural projects registered been the least among all investment sectors, but this number has consistently declined since 2001 from 15 to 6 projects in 2006.

There is no crop insurance although much of the country's agriculture is rain-fed and is therefore subject to shocks of drought and floods.

2.5.2 Implementation and M & E Situation

With inadequate and irregular funding, implementation of agricultural programmes over the years has been a challenge, but even more challenging has been the difficulty in taking equity concerns into consideration in programmes implementation. Even though the aim is not to achieve equal incomes across regions of the country, there is need to raise the overall level of income gains and poverty reduction across the regions and especially among households at the lower end of the poverty spectrum.

MOFA has developed an elaborate M&E system to monitor activities of the sector, review performance, and ultimately feedback into policy and decision making. The inadequacy of the agricultural data collection process and the unreliability of available data has been a serious challenge over the years. The database and statistics on the sector have to be reviewed to make them more current, accurate and streamlined for credibility.

2.5.3 Growth Potential and Sources of Growth

A dynamic computable general equilibrium (DCGE) model applied to the Ghanaian agriculture sector indicates that by closing crop yield gaps, together with reasonable growth in the livestock, fishery and forestry sectors, Ghana will be able to reach a target of 6 percent annual agricultural growth. Under this scenario, the economy-wide GDP growth rate rises to 5.8 percent per year over the next 10 years. However, increased productivity rather than land expansion has to be the main source of this growth. Productivity will explain 47 and 56 percent of GDP and AgGDP growth, respectively. The GDP growth rate of 5.8% falls short of the 8.2% growth projected under the current medium-term development plan. This implies either a higher growth in agriculture or the service and industry sectors.

The contribution of the agricultural sector to total GDP growth rises to 39.4 percent, from the base-run's 31.8 percent. Growth accelerates in all the sub-sectors and is driven by productivity improvements rather than by land expansion, which has been the main contributor to growth in the past. The three staple crop groups grow at an additional 1.4 – 2.0 percent per year, while the additional annual growth is 3.7 percent for export crops, 1.8 percent for livestock and 0.6 percent for fishery/ forestry. The contribution of the combined staple crops to agricultural growth remains a dominant factor in the higher productivity scenario, but its role declines slightly compared to the current growth patterns. While 52.4 percent of agricultural growth in the current pattern is attributed to growth in staple crops, this share falls to 46.4 percent under the higher productivity scenario. Export crops fill this gap and their contributions to agricultural growth rises from 20.4 percent to 31.6 percent.

Growth stimulated from closing yield gaps leads to a lower contribution of factor accumulation of 37.5% to agricultural GDP compared to 56.4 percent under the current growth patterns. At the crop level, productivity growth becomes the dominant factor in the production growth for maize, sorghum, cassava and yam, contributing 60 – 80 percent of output growth in these crops.

The sub-sector contribution to agricultural growth within agro-ecological zones varies across the zones. Fishery and forestry contribute the most to additional agricultural growth in the coastal zone, while export crops are the most important contributors to the forest zone's additional agricultural growth. In the North, additional growth in agriculture mainly comes from the three staple crop groups (cereals, root crops and legumes); while in the Southern Savannah, the root crops are the most important factors for additional agricultural growth.

2.5.4 Experiences from immediate Past and Current Agricultural Programmes and Projects

2.5.4.1 AgSSIP Experiences

Between 2002 and 2006 the Ministry of Food and Agriculture implemented the Agricultural Services Sub-sector Investment Programme (AgSSIP). AgSSIP which comprised four inter-related thematic sub-programmes was supporting and reinforcing the development of improved demand driven agricultural services for rapid agricultural growth and poverty reduction. The main sub-programmes were:

- Strengthening the agricultural technology generation and diffusion systems
- Restructuring and strengthening of MOFA and devolving responsibility for planning and implementing of agricultural extension/ development programmes to the district assemblies
- Development of farmer-based organizations
- Strengthening agricultural education and training

A joint mid-term review of AgSSIP recommended the re-allocation of funds to other initiatives after the end of an extended period of AgSSIP to October 2006. The new activities funded under restructured AgSSIP were:

- Development of horticulture export industry
- Rehabilitation of irrigation schemes
- Development of oil palm industry
- Community fisheries infrastructure development
- Agricultural mechanization service centres

The lessons learned in the implementation of AgSSIP and structures put in place such as establishment of FBOs, the FBOs development fund, Competitive Agriculture Research Grant Scheme (CARGS), challenges in institutional reforms and coordination, a focus on agro-processing, improvement in programme management and strengthening of technology delivery systems will be addressed in implementing this sector strategy. The West African Agricultural Productivity Programme (WAAPP) which operates along the same principles of CARGS has been established and Ghana will have US\$15m available for competitive grants scheme but mainly focusing on roots and tubers. This Fund could be expanded to cover other commodities, policy and related research initiatives that would spur the growth of the agriculture sector in the country.

Under AgSSIP, a National Agricultural Advisory Committee (NAAC) was established; although it met irregularly, the project completion report recommended that such a body should be maintained. The NAAC or its restructured hybrid could be adopted for managing implementation of the METASIP.

The level of Government and development partners sector support along the lines of sector wide

approach through the revised FASDEP must be maintained. Difficulties associated with institutional reforms need to be appropriately and painstakingly tackled. There is the need to coordinate with other agencies that deal with infrastructure, district level planning, private sector, health and others to increase agricultural growth and facilitate transition from production to value addition and thereby unleash the potential of agriculture as an engine of overall growth in the economy. Lessons from AgSSIP implementation also point to the need for broad ownership of programmes from the onset and building in mechanisms for regular consultations.

Agriculture credit seen as key to promotion of intensification rather than extensification of agriculture production was found to be limited despite numerous rural financial institutions. The current World Bank Development Policy Operation (DPO) has earmarked rural financial services as an important area for support. International Funds for Agriculture Development (IFAD) is also investing in rural financial services.

2.5.4.2 Current Programmes and Projects

There are currently thirteen development partners funding agriculture sector related projects and programmes in Ghana. In total there are sixty three interventions, of which two are budget support. Most of the projects support objectives one and two of FASDEP II as shown in Table 8. The time frame for the ongoing programmes, projects and budget support funding are between 2000 and 2012. Planned programmes/ projects are for the period 2006/2007 – 2012.

Some of the on-going projects include the Northern Rural Growth Programme, funded by IFAD, AfDB and GoG, covering the Northern, Upper East and Upper West Regions plus five districts in the Brong Ahafo Region that share boundary with the Northern Region. There are also 13 on-going rice development projects in the country funded by various donors. The World Bank has also signed a DPO for 2008-2011 which is a follow up to AgSSIP and responding to FASDEP II.

Sheanut has been identified as an important crop for income generation in the three northern regions but there is currently no project promoting the crop. Cotton production is also an important cash crop for the north and raw material for textiles and garments industry but has been neglected in the past and currently no project in the country is promoting it. The GSGDAI (2010 - 2013) however envisages a revitalised cotton industry to provide raw materials for the textile industry in the country. Under this plan, cotton will be promoted among targeted crops and commodities for income generation.

Table 8 : FASDEP Objectives and On-going and Planned Projects

FASDEP II Objectives	Share of Entries (%)	
	Ongoing	Planned
1. Food Security and Emergency Preparedness	29.3	22.2
2. Increased Growth in Incomes	34.6	27.8
3. Increased Competitiveness and Integration into Domestic and International Markets	14.3	19.4
4. Sustainable Management of Land and Environment	3.0	5.6
5. Science and Technology applied in Food and Agricultural Development	5.2	11.1
6. Improved Institutional Coordination	13.6	13.9
Total	100	100

Source: DP database 2008

The majority of ongoing DP interventions concentrates on the FASDEP II Objective One (39 interventions, 29.3%) and Objective Two (46 interventions, 34.6%). A significant number of activities potentially contribute to FASDEP Objective Three (19 interventions, 14.3%) and Objective Six (18 interventions, 13.6%). Objective Four (3.0%) and Objective Five (5.2%) are covered by DP interventions only to a very limited extent.

DP interventions at the regional level have over time been skewed towards the three northern regions probably because of the higher relative poverty of the area compared to other regions. Regional ongoing DP interventions are distributed as follows: about 80 percent (79.4%) for the countries' ten regions, 18.5% on national level, and 1.9% are regional interventions. Out of the regions, the three Northern Regions are mentioned most often as regional focus of DP activities (all three with 48.2%, with 16.7% for UW, 13.9% for UE, and 17.6% for NR).

Some regions, such as Eastern (2.8%), Ashanti, Greater Accra and Western (all 3.7%), receive a very low share of regional entries from DP interventions.

Chapter 3

DESCRIPTION OF PROGRAMMES AND JUSTIFICATION FOR PRIORITIES

3.1 Introduction

The situation analysis undertaken in Chapter Two makes it possible to identify various priority development issues. These development issues have been categorised into six key programmes with components. The programmes correspond to FASDEP II strategic objectives and they are further broken down into components which are basically development themes. A Potential, Opportunities, Constraints and Challenges (POCC) analysis was applied to each development issue (under the various components), outputs and activities derived. The development issues, outputs and activities under each programme and component are presented in this Chapter. MOFA is the overall lead agency in the implementation of the METASIP but various MDAs, organisations, groups, and individuals will actively collaborate to implement the Plan. Collaborators required for each component are given in Appendix 1.

3.2 Synergy among the Programmes

All six programmes and their components are inter-related. The food security and income growth programmes promote selected commodities. The programmes for access to markets, science and technology, environmental sustainability and institutional capacity, support value chain issues for the promotion of the commodities. Ongoing projects are considered along the six programme areas and will be reviewed further at component and activity levels to determine areas for adjustment, up scaling or gaps for new support.

A critical review of the logic model for the Investment Programme reveals that there is a high degree of synergy between the 6 programmes. In particular, they all contribute to the attainment of the programme development objective, i.e. modernised agriculture, structurally transformed economy, food security, employment and reduced poverty. Institutional capacity building across the various program components is in sync with the need for learning and innovation which will provide the basis for higher technology adoption and subsequent high productivity and income growth.

The plan takes note of the need to collaborate with institutions to leverage skills and build on synergies between programmes to ensure successful implementation. Details of areas of collaboration with relevant institutions and organisations to ensure synergy are provided in Appendix 1 of this document.

3.3 Programme 1: Food Security and Emergency Preparedness

Statistics indicate that about 18.2% of Ghanaians who fall below the extreme poverty line are chronically food insecure (GSS, 2007). About 10.3% classified as poor, but who fall above the extreme poverty line, are vulnerable to food insecurity; this group may suffer from transient food insecurity, due to, for example, seasonal food shortages linked to production variability. The Upper East Region, for example, is the most vulnerable to transient food insecurity. The

programme for enhancing food security and emergency preparedness will increase productivity and total production and improve food distribution to vulnerable groups and enhance nutrition. The nutrition aspect of food security will also be promoted through research, education and advocacy on choice of foods, and handling for food quality and safety. Groups most vulnerable to food insecurity will also be supported with income diversification opportunities to enable them cope better with adverse food supply situations, production risk and enhance their incomes for better access to food.

The components under the food security and emergency preparedness programme are:

1. Productivity improvement

Priority staple crops as defined in FASDEP II for support are maize, cassava, rice, yam and cowpea. Maize and cassava are grown by most producers, largely cutting across differences in land holding and geography. There is a growing excess demand for rice. Its per capita consumption has increased from about 12kg in 1980 to 24kg in 2009. Between 2006 and 2008, Ghana imported an average of 409,000 Mt of rice worth US\$168 million. Yam is a high energy crop and is generally preferred to cassava. Cowpea is the most widely consumed legume.

Gaps between achievable yields (under best farmer practices) and actual yields range from about 37% for maize, 55% for cassava, 25% for cowpea, 42% for rice and 36% for yam. Opportunity therefore exists to increase the production of these crops through intensive methods such as use of certified seed and Good Agricultural Practices (GAPs).

Use of improved agro-inputs is generally low in Ghana but this is more so among smallholder subsistence farmers. Data from the GLSS V shows that only 5-10% of smallholders with up to 1 Ha used fertiliser, compared to 30% of holders with more than 5Ha. Twenty percent of the very small subsistence farmers used improved seed compared to 30% of the relatively larger smallholders. The reasons for low use of agro-inputs are high cost and limited availability in remote production areas. There is also the problem of adulteration which lowers confidence of users in the inputs.

The strategy to increase productivity at the farm level will include continued research on improvement of priority commodities, sustainable land and water management, integration of crop and small ruminant development, access to irrigation, improved access to appropriate mechanisation, improved access to extension services, increased adoption of Integrated Crop Pest Management (ICPM) measures and linkage to markets.

2. Support to improved nutrition

The ultimate goal of food production and consumption is adequate nutrition of the human body for higher productivity and reproduction. Thus, emphasis on production that ensures adequate nutrition of farm and non-farm household members is necessary.

It is known that nutritional improvements are closely associated with decrease in poverty. However, according to the Ghana Demographic and Health Surveys of 1998 and 2003, the level of malnutrition (stunting of children) increased between 1998 and 2003 even when poverty levels decreased quite significantly. Micronutrient malnutrition levels are also quite high. This suggests that increase in incomes may be a necessary condition for decrease in malnutrition but it is not a sufficient condition. In view of this, nutrition education and advocacy will be pursued to ensure that people have adequate knowledge and appreciate the importance of both macronutrient and

micronutrient malnutrition. Also food production systems will take into consideration foodstuffs with good levels of both macro and micronutrients. Food fortification would be an important component of food processing.

3. Support for diversification of livelihood options of the poor with off-farm activities linked to agriculture

An analysis of the GLSS V data on smallholder production patterns by IFPRI Ghana Strategy Support Programme (GSSP) shows that subsistence farmers are less diversified in agriculture than relatively larger smallholders. Mean number of crops grown by households with up to 1 hectare was 3 compared to 5 for households with more than 5 hectares. Fewer crops in the portfolios of producers with smaller farms implies that they are not as diversified as large farmers and therefore are more vulnerable to the risk of crop failure. However, MOFA's livelihood study in 2005 also concluded that these vulnerable subsistence farmers, if given a windfall, will rather invest in off-farm activities than in farming. These findings suggest that poor subsistence farmers need to diversify their production systems but support for diversification should look beyond farming to off-farm alternative livelihoods. Success in these off-farm livelihood strategies, which could still be in agriculture, can help reduce the vulnerability of the poor and thereby give them the confidence to invest in farming.

4. Food storage and distribution

Available data (Table 9) shows that up to 35% of maize and 34% of cassava produced is lost along their respective value chains (MOFA, 2009). This is a major loss and potential cause of food insecurity. Factors associated with losses include limited knowledge on post-harvest handling, poor harvesting methods, poor storage systems, poor access to information on pest control methods and poor transportation methods and equipment. In general, Ghana is considered food secure but there are pockets of regional disparities in food availability in some regions such as the northern regions being food insecure. This regional disparity will be addressed through improved food distribution network.

A major focus to reduce post-harvest losses will include capacity building of producers in better harvesting, transportation and storage methods, introduction of grading methods and linkages between producers and markets. A core team of extension staff will be trained in post-harvest technologies to provide a reservoir of specialized extension agents in each region for training of producers and other actors (grain traders and distributors) along the value chain.

Table 9 : Levels of Post-harvest Losses and Reduction Targets

Crop	Current level of post-harvest losses (in %)	Targets by 2015 (in %)	Percentage reduction from baseline
Maize	35.1	25.0	30.0
Cassava	34.6	20.0	40.0
Yam	24.4	12.0	50.0
Rice	6.9	4.0	35.0

Source: MOFA, 2007

Distribution systems will be improved to balance food deficit and food surplus areas through improved information gathering and dissemination and development of an efficient grain trade system. Efforts will also be directed at improving the transportation system and roads in major producing areas.

Value addition increases the economic value as well as the shelf life of food commodities. Various interventions for value addition will be pursued including warehousing, agro-processing, packaging and distributing. Investment in warehousing will be promoted to improve the quality of staples along the chain and to increase trade in legumes and cereals. Warehousing is also expected to contribute to commodity price stabilization. Existing warehouses will be upgraded by installing appropriate equipment, while new ones will be established in strategic areas in the country. MOFA and relevant agencies will put in place and enforce grading standards to be applied in all warehousing centres.

The Directorate of Agricultural Extension Services will be expected to play a major role in linking smallholders with warehousing investments. Market information gathering and intelligence will be improved to provide up to date information on commodity trade in order to make the linkages between producers and smallholders efficient and transparent. Information collected will include production forecasting, actual production data, market prices and food supply situation of major food crops in all the regions.

Agro-processing will be promoted through support to individual and group initiatives aimed at adding value to major food staples. Priority will be given to maize (milling and packaging), rice (milling and packaging), cassava (gari, flour, etc), yam (flour), cowpea (grading and packaging) etc. The support includes targeted training in value addition and linkages with relevant service providers and markets. Use of appropriate grades and standards will be emphasised to improve quality, improve market penetration and reduce post-harvest losses. In promoting agro-processing, care will be taken to ensure that the activities are carried out in an environmentally safe and sustainable manner. Thus all agro-processing interventions will be required to put in place environmental mitigation measures. Gender equity will be emphasised in all activities along the value chain to ensure that the disadvantaged, especially women and youth play a major role in all activities. Women in Agriculture Development (WIAD) will play a leading role in these initiatives.

5. Early warning systems and emergency preparedness

FASDEP II defines emergency preparedness as the assessment of the country's readiness to respond to the needs of victims of natural hazards and other calamities including climate change impacts. In the case of food, it is the ability to provide food to affected persons in times of disaster. Outbreaks of diseases and pests and poor weather (drought and floods) are the main natural causes of emergency food insecurity. Outbreaks of diseases and pests can have major negative effects on livestock and crop production. The capacity to respond to these emergencies is currently limited.

The ability to respond to pests and disease outbreaks depends on timely forecasts and preparedness. The capacity of Plant Protection and Regulatory Services Directorate (PPRSD), the Veterinary Services Directorate (VSD) and allied institutions will be strengthened to monitor pest and disease incidence (including border controls). Linkages with international centres will be strengthened to provide pest and disease surveillance and weather forecasts. Routine and occasional control of pests and diseases will also be carried out.

The Ghana Meteorological Agency will be encouraged to provide more localised weather forecast information (including expected rainfall onset, and duration) for each of the regions in the country, and especially the most vulnerable regions. This information will be communicated to the farmers through the media (electronic and print) and by the Directorate of Agricultural Extension Services to ensure timely land preparation and planting.

National strategic stocks are important in an economy that is prone to natural disasters and emergencies. Thus, there is need to establish and efficiently manage buffer stocks of major agricultural commodities such as maize, rice and gari. There should be at least a 6-month supply of food strategic stocks to ensure that emergencies related to annual climate variabilities can be effectively managed.

6. Irrigation and water management

Irrigation development has been recognised globally as very important in overcoming climate uncertainty with regard to agricultural production and productivity. It is also important in increasing the utilization of the same piece of land several times in a year, thus increasing production and productivity. Irrigation development also ensures that there is good drainage of flood prone areas.

Weather uncertainties have had great adverse impact on the nation's agriculture over the years and even though irrigated agriculture is well known to be important it is yet to be significant in Ghana. It contributes only about 0.5% of the country's agricultural production (Breisinger et al, 2008). Only about 11,000 hectares of land (out of identifiable irrigable area of 500,000 hectares) have been developed for formal irrigation and even the developed area is largely underutilized due to institutional, management, input and other constraints. On the other hand, 17,636 hectares are under informal irrigation.

Large scale irrigated agriculture in particular has had problems mainly because of management constraints, which are being addressed. Emphasis should now be placed on micro and small scale irrigation systems in the short- and medium-term, since most of these have been largely successful. It is however necessary to also plan in the long term to develop large scale irrigation systems in large irrigable areas such as the Afram Plains, several valleys in the northern and southern savannas and accelerate the ongoing development efforts in the Accra Plains. Irrigated agriculture is largely capital intensive and investments take a long time to bring returns thus, it is not an attractive area for private investors. It is thus necessary that the Government regards irrigated agricultural infrastructure as a public good, which can be leased to water users' associations and/or private management bodies to ensure efficiency through better management practices.

Water harvesting for human, animal and plant use needs to be instituted as a policy and implemented with some priority especially in the savanna areas of the country. It may turn out to be the most cost effective method of irrigation in the area. It is recognised that irrigated agriculture can only be viable if there are backward linkages to infrastructure, inputs and research and forward linkages to agro-processing and marketing. Thus other components within the Food Security and Emergency Preparedness Programme as well as in the Increased Growth in Incomes Programme complement this component.

7. Mechanisation services

According to MOFA's 2005 baseline survey, about 40% of farmers used some form of

mechanisation. The most mechanised farm activity is land preparation. There is therefore scope to expand mechanisation to other farm activities such as planting, cultivation, harvesting and primary processing such as threshing, shelling and milling. Mechanised equipment for milling is available but processors have limited access to them. Also, the efficiency of the equipment is low and needs to be improved. The quality of locally manufactured equipment and machinery is not up to food grade standard.

Specific areas where rain water harvest is a major source of water for farming include Fumbisi, Katanga, Nasia, Nabogu and Soo valleys. Such areas which are also suitable for rice get inundated quickly after the first few rains thereby making the fields unworkable. Because they are large open areas, they are highly susceptible to bushfires. Access to mechanised services in these areas will expedite land preparation before the rains and facilitate timely crop harvest.

Component 1.1: Productivity Improvement

Development issues:

1. Low use of improved technology and practices in crops, livestock and fisheries by men and women farmers/fishers.
2. Low access (in quantity and quality) to agriculture extension services by men and women farmers.
3. Low use of inputs by smallholder men and women farmers (5-10% fertilizers, 30% improved seeds – GLSS V).

Output 1.1.1: Improved technologies adopted by smallholder farmers and yields of maize, rice, sorghum, cassava and yam increased by 50% and cowpea by 25% by 2015 (from the base yields shown in Table 7).

The set of interventions which have been planned to improve upon the use of improved technology in agriculture include:

- a) Identify, update and disseminate existing technological packages.
- b) Introduce improved crop varieties (high yielding, short duration, disease and pest resistance, and nutrient-fortified).
- c) Intensify the use of mass communication systems and electronic media for extension delivery (radio programmes, information vans, posters etc.)
- d) Disseminate extension information through FBOs.
- e) Translate technical packages and information into six (6) major local languages as new technologies are generated.
- f) Increase access to fertiliser.
- g) Monitor the prices of agro-inputs in relation to tax waivers to ensure that waivers are enjoyed by producers.
- h) Facilitate the development and enforcement of the Plant and Fertilizer Act 2010, (Act 803).
- i) Strengthen surveillance of agriculture input trade and use (including capacity of PPRSD).
- j) Develop targeted extension messages on input use to avoid misapplication of fertilizers and agro-chemicals.
- k) Seed/planting material
 - Expand infrastructure for seed/planting materials production, processing,

- storage and marketing to facilitate private sector seed/planting materials production.
- Review the role of the various institutions involved in the seed industry to improve interface management.
- Advocate for a regional seed/planting material policy under West Africa Agricultural Productivity Programme (WAAPP).

Output 1.1.2: Production of poultry (including guinea fowl) increased by 20% and small ruminants and pigs by 25% by 2015 through adoption of improved technologies

The following set of activities have been planned to increase the productivity of poultry small ruminants and pigs:

- a) Identify, update and disseminate improved livestock technological packages.
- b) Undertake genetic characterisation and improvement of local livestock species.
- c) Introduce improved livestock breeds.
- d) Train farmers on livestock disease management
- e) Use mass communication methods for livestock extension delivery that responds to practical gender needs (radio programmes, information vans).
- f) Disseminate extension information through FBOs.
- g) Translate technical packages and information into the 6 major local languages as new technologies are generated.
- h) Train community livestock workers (health and production) to act as service agents.
- i) Conduct active diseases surveillance in both domestic and wild animals and birds.
- j) Produce or procure relevant vaccines for livestock.
- k) Organise nationwide campaign for prophylactic treatment of livestock diseases.
- l) Strengthen the capacity of VSD to carry out regulatory activities.
- m) Control the local movement of animals and local slaughter of livestock for food.
- n) Alleviate the suffering of animals through timely veterinary interventions.
- o) Strengthening institutional capacity for improved animal healthcare management and technical services delivery.
- p) Strengthen the diagnostic capacity of the regional veterinary laboratories.
- q) Equip and provide logistics for animal health clinics in all district capitals.
- r) Rehabilitate and equip all the quarantine stations.
- s) Collaborate with the neighbouring countries of Togo, Benin, Nigeria, Burkina Faso and Ivory Coast on emerging and re-emerging diseases.

Output 1.1.3: Productivity of cultured fish increased by 50% from 10,000mt in 2010 to 15,000 by 2013

In order to address the issue of low productivity of cultured fish, the following sets of interventions have been planned:

- a) Disseminate existing fish culture technological packages in all parts of the country by end of 2011 (not all parts have potential for culture).
- b) Train farmers on stock management and good fishing practices.
- c) Promote the use of communal small water bodies for fish production.

- d) Train farmers on how to manage disease problems in fish production.
- e) Establish fish health unit.
- f) Use mass communication methods for culture fish extension delivery (radio programmes, information vans).
- g) Disseminate extension information through fishery FBOs.
- h) Translate technical packages and information into the 6 major local languages as new technologies are generated.

Component 1.2: Support to Improved Nutrition

Development issue:

High levels of stunting and high deficiency levels of vitamin A, iron and iodine in many parts of the country

Output 1.2.1: Stunting and underweight (in children) as well as Vitamin A, iron and iodine deficiencies (in children and women of reproductive age) reduced by 50% by 2015.

In order to address the issue of stunting and high deficiency levels of vitamin A, iron and iodine the following activities have been planned:

- a) Promote the production and consumption of High Quality Protein Maize, Orange-flesh sweet potato (for vitamin A) as well as moringa and other leafy vegetables.
- b) Develop other high quality staples through breeding – cassava, yam, rice etc.
- c) Promote fortification of staples during processing (micronutrient fortification and blending products) and link to the school feeding programme.
- d) Educate and train consumers on appropriate food combination of available foods to improve nutrition.
- e) Promote the consumption of micro-nutrient rich foods (e.g. eggs, meat/fish, leafy vegetables, fruits) by children and women of reproductive age especially in rural areas.

Component 1.3: Support for Diversification of Livelihood Option for the Poor with Off-Farm Activities Linked to Agriculture

Development issue:

Limited capacity of the poor to engage in income generating activities (the vulnerable will invest in off-farm activities rather than farming).

Output1.3.1: Five percent of people falling below extreme poverty line supported to engage in off-farm livelihood alternatives by 2015 (use the *GLSS V of 2005/06 as the basis*)

The set of activities that have been planned to improve the capacity of farmers to engage in income generating activities include the following:

- a) Promote off-farm activities with particular focus to supporting establishment of agro processing Micro and Small Enterprises (MSEs), and targeting women and the youth.

- b) Identify and train vulnerable groups within communities in entrepreneurial skills.
- c) Identify viable markets for off-farm livelihood opportunities (e.g. soap and creams from agricultural by-products, special herbs, honey, snail, mushroom, grass-cutter etc).
- d) Conduct value chain analysis on viable livelihood opportunities.
- e) Develop value chain for the products/commodities.
- f) Identify NGOs in microfinance to promote and sustain community based savings and credit schemes.
- g) Introduce targeted grants and subsidies on inputs to poor farmers to improve farm level production and marketing activities.
- h) Support Veterinary in the diagnosis, prevention and treatment of diseases associated with bees, grasscutters and snails.

Component 1.4: Food Storage and Distribution

Development issues:

1. High post-harvest losses along the value chain
2. Low integration of commodity markets

Output 1.4.1: Post-harvest losses along the maize, rice, sorghum, cassava, yam, and fish value chains reduced by 30%, 35%, 20%, 40%, 50% and 30% respectively by 2015 (based on baseline in MOFA 2007 post-harvest study).

The following set of activities has been programmed to reduce high post harvest losses along the value chain:

- a) Train and resource extension staff in post-harvest handling technologies.
- b) Train producers, processors and marketers in post-harvest handling.
- c) Improve storage facilities along the value chain.
- d) Promote appropriate transportation systems.
- e) Provide regular market information (deficit/ surplus areas) to improve distribution of food stuffs.

Output 1.4.2: Private sector capacity (including FBOs) developed to store 50,000Mt of grain annually and to process (mill and/or package) 25,000 Mt of maize, cassava, yam, sorghum and cowpea products annually.

The following set of activities have been planned to achieve higher integration of commodity markets:

- i) Warehousing:
 - a) Facilitate the establishment of a regulated warehousing system by 2011.
 - b) Rehabilitate existing warehouses and silos and establish private-public-partnership (PPP) management by 2011
 - c) Link smallholders to warehousing system in the grain supply chain
 - d) Improve market information (increase level of analysis and frequency of dissemination).
 - e) Identify selected road network for improvement to enhance food

distribution.

ii) Processing:

- a) Identify potential private sector food processors (individuals and groups).
- b) Build capacity of food processors in value addition (value chain concept, packaging, branding, quality control, environmental hygiene etc.).
- c) Facilitate linkages with relevant service providers and markets (input and output).
- d) Create awareness about utilisation of processed food.

Component 1.5: Early Warning System and Emergency Preparedness

Development issues:

1. Non existence of a holistic early warning system.
2. Inadequate systems, knowledge and capacities at household, community and national levels to respond to emergencies.
3. Susceptibility of crops/livestock to pests and diseases.

Output 1.5.1: Numbers of food insecure (vulnerable) households reduced by 20% by 2015 (*GLSS V 2005/06 as the basis*)

In order to develop a holistic early warning system, the following set of activities will be undertaken:

- a) Identify vulnerable households in disaster prone areas of the country.
- b) Construct vulnerability maps to support targeting of food security and emergency preparedness interventions.
- c) Support vulnerable households and communities to establish household and community systems that can respond to emergencies (with regards to food insecurity).
- d) Monitor crops, livestock and fish pests and diseases.
- e) Use weather forecasting to inform farmer decisions.
- f) Build capacity of National Food Buffer Stock Company to manage national strategic reserves:
 - Establish a 6-month supply of food strategic stocks (maize, sorghum, gari etc.).
 - Use market and price information for managing the stocks and price stabilization.
- g) Establish a National Seed Security stock for emergencies.

Component 1.6: Irrigation and Water Management

Development issues:

1. Dependence of agriculture on poor and erratic rainfall.
2. Inefficient use of available irrigation systems.
3. High development and running costs of irrigation systems.
4. Low productivity on existing irrigation schemes.
5. Delay in completion of design and implementation of some large irrigation schemes.

6. Low capacity of relevant staff in irrigated agriculture.

Output 1.6.1: Irrigation schemes' productivity increased by 25% and intensification by 50% by 2015

In order to increase efficiency of irrigation schemes, the following set of activities have been planned for implementation:

- a) Complete rehabilitation of Tono Irrigation Scheme.
- b) Rehabilitate Ve, Mankesim and Anum Valley Irrigation Schemes.
- c) Rehabilitate 50 breached dams in Greater Accra and Volta Region.
- d) Enhance the skills of GIDA staff for consultative participatory project identification, planning, implementation, monitoring and evaluation.
- e) Train extension workers on irrigation and water management technologies and skills to enable them undertake irrigation extension, participatory methods in dealing with farmers as well as market extension.
- f) Build the capacity of water user associations in agricultural water management and their obligations as major beneficiaries (group formation and benefits, irrigation methods and maintenance, multiple use of water – culture based fisheries, business management skills, etc).
- g) Undertake comprehensive management needs assessment of existing large irrigations schemes.
- h) Establish participatory management systems in large scale irrigation schemes.
- i) Procure three basic maintenance equipment (backhoe, dragline and grader).
- j) Undertake lake-front protection.
- k) Provide required training. Provide necessary logistics and equipment for the efficient management of the systems.
- l) Establish links to input and output markets and service providers (strengthen value chain)
- m) Build capacity of service providers especially in small dam construction.

Output 1.6.2: 22,590 Ha of micro irrigation schemes developed by 2015 to benefit 50,000 households.

Activities planned to reduce dependence on rain fed agriculture include the following:

Micro schemes:

- a) Identify sites in various river flood plains for micro irrigation systems.
- b) Train selected farmers in the installation, operation and maintenance of recommended irrigation technologies.
- c) Facilitate procurement and delivery of equipment through suppliers who can provide technical backstopping and training of local artisans.
- d) Facilitate installation and establishment of pump irrigation schemes.
- e) Facilitate the formation of water users' associations at the irrigation sites.

Small scale schemes:

- a) Promote use of existing small community and small scale dams.
- b) Identify suitable areas for the construction of community small scale irrigation dams and establish small scale furrow irrigation systems.
- c) Liaise with Ministry of Roads and Highways to identify suitable areas for culvert

- diversion weirs during road construction to be used for irrigation purposes.
- d) Train selected farmers in the operation and maintenance of recommended small scale irrigation technologies.
- e) Facilitate the formation of water users' associations at the irrigation sites.

Output 1.6.3: 62,000Ha of sustainable water harvesting and agricultural water management schemes in Northern and Southern Savannah zones identified and developed to benefit 10,000 households.

Activities to develop water management schemes to reduce dependence on rainfall include:

- a) Identify suitable areas for rain water harvesting and agricultural water management schemes.
- b) Train selected farmers/household members in water harvesting and agriculture water management technologies.
- c) Facilitate the construction of water harvesting structures at house hold and community levels.
- d) Study and construct culvert diversion weirs on feeder roads.

Output 1.6.4: Feasibility studies for large scale irrigation projects in the country updated by 2012 and funds for implementation sourced by 2012.

The following activities are planned to accelerate the pace of development of schemes:

- a) Update feasibility study of 500,000Ha of large-scale irrigation projects and undertake detailed studies and design for 200,000Ha.
- b) Conduct studies into mapping irrigation potential and prepare bankable projects for the country.
- c) Prepare investment plans for irrigation of the Accra Plains Irrigation Project.
- d) Source funds for implementation of the projects by 2012.
- e) Start construction of projects by 2013.

Component 1.7: Mechanization Services

Development issues

1. Low access to mechanization services along the value chain (production, processing, etc).
2. Low use of intermediate technology (animal traction).
3. Inadequate production (in quality and quantity) of processing equipment.
4. Inadequate skills training in agro-processing technologies.
5. Limited information on demand for agro-industrial machinery and equipment in Ghana and the West African sub-region.

Output 1.7.1: At least one (private sector led) mechanisation centre established in each district by 2015 to provide diversified services to all types of farmers and agro-processors (small, medium and large).

In order to improve access to mechanization services along the value chain, the following

activities have been planned:

- a) Collaborate with NGOs to intensify use of animal traction by smallholder men and women farmers operating on fragile soils.
- b) Promote diversified mechanisation services along the value chain.
- c) Promote FBO ownership of large capacity machinery/equipment
- d) Promote usage of IMTs.
- e) Facilitate access to credit facilities.
- f) Train more agricultural mechanisation technicians (e.g. tractor operators).

Output 1.7.2: Private sector facilitated to establish mechanisation service centres (for production and processing) in specific areas where rain water harvest is major source of water for farming (e.g. Fumbisi, Katanga, Nasia, Nabogu and Soo valleys).

(Such areas which are also suitable for rice get inundated quickly after the first few rains thereby making the fields unworkable. Because they are large open areas, they are highly susceptible to bushfires. Access to mechanised services in these areas will expedite land preparation before the rains and facilitate timely crop harvest).

Activities aimed at establishing mechanization centres in specific areas of the North where rain water harvest is a major source of water for farming includes:

- a) Prepare investment plans for mechanisation centres.
- b) Identify potential investors.
- c) Develop necessary infrastructure to attract private investors.
- d) Provide necessary support to private sector investors (credit lines, land, capacity building, and links with farmers groups).

Output 1.7.3: Incentives provided for agro-processing industries to adopt food grade processing technologies by 2012.

Activities aimed at improving quality of food processing include:

- a) Undertake an assessment of quality of agro-processing technologies used in food processing.
- b) Develop standards for agro-processing equipment for various types of food products.
- c) Facilitate the use of food grade equipment in agro-processing.
- d) Equip GRATIS, and ITTUs to offer training to potential agro-processing equipment and spare parts manufacturers.
- e) Facilitate access to credit facilities.

3.4 Programme 2: Increased Growth in Incomes

National, sub-regional, continental and global policy documents all emphasize on poverty reduction and wealth creation by the poor as critical for national and global development and security. Ghana's agricultural sector policy points out the need for enhanced growth in incomes in the agricultural sector through diversification into cash crops and livestock, and for value addition. The policy indicates that enhanced incomes will reinforce food security through

financial access to food. This implies that there is need to diversify into cash crops and livestock in a more business oriented fashion. There is also the need to add value to commodities being produced and to develop new products. It is also important that markets are found for existing, diversified and new products to ensure that incomes are increased and variability reduced from year to year within farming communities and between rural and urban areas.

Priority cash crops identified in FASDEP II include mango, oil palm, rubber, plantain and citrus. It is also necessary to promote cotton, soybean and sheanuts in the northern savannah area where poverty is endemic and the income generating potential of these crops is high. Breisinger *et. al* (2008) have concluded from their analysis of Ghana's agricultural sector, that targeted policy and investment is needed to lift the poorest of the poor out of poverty. It means interventions to increase incomes should pay special attention to poor areas for more meaningful poverty reduction.

Livestock continues to be the largest non-land asset of many rural households in Africa, including Ghana. It is known to contribute significantly to household food security and incomes, especially in the rural areas. There is need therefore to promote smallholder livestock business enterprises. FASDEP II has identified small ruminants and poultry (including guinea fowls) as priority livestock types to be promoted for income growth. Both small ruminants (sheep and goats) and domestic poultry are reared in all parts of the country. Guinea fowl rearing is however concentrated in the northern savannah areas. There is a growing demand for guinea fowl meat all over the country and the potential for increased production is high.

Components under this programme are:

1. Promotion of cash crop, livestock and fish production for income in all ecological zones.
2. Development of new products.
3. Development of pilot value chains for one selected commodity in each agro-ecological zone.
4. Intensification of FBOs and out-grower concept.
5. Development of rural infrastructure.
6. Support to urban and peri-urban agriculture.

Component 2.1: Promotion of Cash Crop, Livestock and Fish Production for Income in all Ecological Zones

Development issues:

1. Low levels of income from cash crop production by men and women smallholder farmers.
2. Low productivity of animal breeds and low production of improved breeds to meet demand.
3. High levels of animal diseases and inadequate feed and water for animals.
4. Limited market linkages for livestock and livestock products.
5. Low production of culture fish to meet the increasing demand.
6. Limited exploitation of potential income generating production systems.

Output 2.1.1: Income from cash crop production by men and women increased by 20% and 30%

respectively by 2015.

The set of interventions aimed at improving incomes of cash crop farmers includes:

- a) Build capacity of nursery operators in all tree crop growing areas and support them (certify and assist to obtain resources) to expand and improve quality of seedlings.
- b) Build capacity of certified seed growers and support them (to obtain resources) to expand and improve quality of seed.
- c) Strengthen the capacity of PPRSD and allied institutions for monitoring and certification of seed and seedlings.
- d) Disseminate information on improved production technologies through ICT.
- e) Build capacity of cash crop farmers to improve productivity and quality.
- f) Link cash crop farmers to credit sources (rural banks, NGOs, outgrower schemes etc.).
- g) Facilitate contractual arrangements between cash crop producers and marketers/industry.

Output 2.1.2: Income from livestock rearing by men and women increased by 10% and 25% respectively by 2015.

The following set of activities have been planned to improve the incomes of livestock farmers:

- a) Rehabilitate, re-stock and build capacity of livestock breeding stations to produce improved breeds of livestock for farmers.
- b) Facilitate and support the acquisition of improved breeding stocks by men and women farmers.
- c) Provide adequate and effective extension knowledge in livestock management, record keeping and financial management to men and women farmers.
- d) Introduce efficient animal health interventions.
- e) Establish sustainable artificial insemination services.
- f) Resource veterinary laboratories in Pong-Tamale and Accra for local production of bacterial vaccines and thermostable New Castle Disease I₂.
- g) Facilitate linkage of livestock FBOs to credit sources and markets.
- h) Identify areas with acute problems of water for livestock and construct water points (at least 50 per year starting from 2011).
- i) Promote communal grazing lands.
- j) Facilitate and support establishment of pastures and fodder crops by farmers.
- k) Facilitate and support improvements in livestock housing by farmers.
- l) Advocate for the construction of slaughter houses/slabs in all districts.
- m) Genetic characterization of sheep, goat and guinea fowl.
- n) Review and sensitization of livestock policy.
- o) Facilitate the linkage of producers to marketers.
- p) Promote value addition in livestock.

Output 2.1.3: Production of culture fisheries by men and women increased by at least 60% by 2013 (from 10,000mt in 2011 to 16,000mt in 2013).

The set of activities planned to increase incomes of fish farmers include:

- a) Facilitate the production of fingerlings by private sector
- b) Identify active private fish culture producers as nucleus producers.
- c) Identify potential fingerlings producers in various ecological areas.
- d) Support construction of ponds, training in fingerlings production and pond management and production of fish feed.
- e) Introduce new fish breeds.
- f) Reduce post harvest losses of fish by providing cold storage and processing infrastructure.
- g) Promote value addition in fisheries along the value chain.
- h) Increase productivity of culture fish through adequate and effective fish farming extension services.
- i) Procure fish hatchery equipment.

Output 2.1.4: Post harvest losses of mango, plantain, tomato, pineapple, papaya and citrus reduced by between 25 and 50% by 2015.

The following activities have been planned to reduce post harvest losses of plantain, mango, tomato, papaya, pineapple and citrus:

- a) Train and resource extension staff in post-harvest handling technologies.
- b) Train producers, processors and marketers in post-harvest handling.
- c) Provide improved storage facilities along the value chain.
- d) Promote appropriate transportation systems.
- e) Generate and provide regular market information (deficit/ surplus areas) to improve distribution of food stuffs.
- f) Establish cold chain handling of commodities.
- g) Promote appropriate handling containers for produce, especially tomato.

Output 2.1.5: Products from bee keeping, mushroom and snail farming and production of small stocks increased by 20 to 50% by 2015.

In order to explore the potential of other non-traditional products for income generation, the following activities will be implemented:

- a) Document lessons learnt by relevant stakeholders in current and previous interventions in promoting the commodities.
- b) Update technical and management information on the production and marketing of the commodities.
- c) Build the capacity (training and resources) of producers and potential producers in technologies.
- d) Promote value addition (support for market research, processing, blending, packaging and commercialization).
- e) Identify markets for the products and link to producers.

Component 2.2: Development of New Products

Development issue:

Many agricultural products are sold in their raw form and are thus bulky, with short shelf lives and

inconvenient to use.

Output 2.2.1: At least two new commercially viable products developed from each of staple crops, horticultural crops, livestock and fisheries by 2015.

The following set of activities have been planned to develop new agricultural products:

- a) Source funds for research into new product development.
- b) Develop products that are not bulky, have long shelf life, are safe and convenient to use.
- c) Institute competitive grant scheme for research into new products.
- d) Identify existing value addition technologies and promote to the private sector.
- e) Assess demand for value addition technologies.

Component 2.3: Development of Pilot Value Chains for Two Selected Commodities in each Agro-Ecological Zone.

Development issues:

1. Limited value chains development and mainstreaming.
2. Disjointed value chains with regards to most agricultural commodities.

Output 2.3.1: Efficient pilot value chains developed for two selected commodities in each agro-ecological zone (pineapple and chillies in Coastal Savanna, commercial poultry and pig in the Forest, maize and tomato in transitional and guinea fowl and tomato in Guinea/Sudan Savanna).

The set of interventions which have been planned to depend and harmonise value chain development include:

- a) Establish regional core teams for value chain development backstopping.
- b) Upscale training in value chain analysis for MOFA and MDA staff.
- c) Identify and build capacity of actors in value chain concept and processes
- d) Undertake advanced market feasibility studies to promote demand for the selected commodities.
- e) Facilitate linkage to markets for the selected commodities.
- f) Sensitize actors along the value chain on the importance of value addition.
- g) Sensitize actors in the value chain on the need for collaboration.
- h) Build capacity of actors along the value chain on GAPs, GMPs and HACCPs.
- i) Carry out epidemiological surveillance on poultry and pigs in the designated ecological zones.
- j) Provide preventive and curative measures to safeguard the health and production of the selected animals.

Component 2.4: Intensification Of FBOs and Out-Grower Concept

Development issues:

1. Many scattered small producers.
2. Limited access to input and output markets.

Output 2.4.1: Development of out-grower schemes and FBOs intensified and three-tier FBO structure achieved in all districts by 2015.

The following set of interventions have been planned to expand access to input and output markets and also achieve focused interaction with farmers:

- a) Establish a mentoring system for developing new out-grower schemes (nucleus farmers and award winners).
- b) Sensitize FBOs and out-growers in the value chain concept.
- c) Support provision of embedded services through FBO and nucleus-out grower systems and input/crop traders.
- d) Facilitate the development of FBOs to the level of input and service providers.
- e) Facilitate linkage to credit sources and industry.
- f) Facilitate the building of FBOs from primary to tertiary level at the district level.
- g) Facilitate and establish arbitration systems in the out grower schemes.

Output 2.4.2: Fish Farmers Associations (FFAs) and Community Based Fisheries Management Committees (CBFMCs) fully developed by 2015.

The following activities are scheduled for implementation in order to ensure focused interaction with fishermen and fish farmers:

- a) Sensitize FFAs in service provision in aqua-culture districts.
- b) Form and strengthen CBFMCs for co-management with government in coastal and lake districts.

Component 2.5: Development of Rural Infrastructure

Development issue:

Poor rural infrastructure (poor road network, limited rural industries, inadequate energy and access to portable water etc.).

Output 2.5.1: Cost of transportation of agriculture produce in rural areas reduced by at least 5% in areas where infrastructure has been improved by 2015.

Priority interventions which have been planned to overcome infrastructural bottlenecks in agriculture are:

- a) Link all district capitals to each other with tarred roads.
- b) Link at least 70% of communities in districts by feeder roads to district capitals.
- c) Construct farm tracks in farming areas.
- d) Facilitate the establishment of marketing centres with appropriate infrastructure.

Output 2.5.2: Rural industrial processing of cassava, oil palm, sheanuts, cashew nuts, soybeans and groundnut increased by 20%, 20%, 40%, 30%, 30% and 30% respectively by 2015.

Activities to develop rural industries in crop processing include:

- a) Identify potential investors and support them to set up cottage industries.

- b) Identify suitable sites and provide necessary utilities.
- c) Build capacity and facilitate ITTU and other fabricators to fabricate appropriate machinery.
- d) Enhance importation of appropriate agro-processing equipment.
- e) Enforce byelaws on hygienic environment and food safety within the cottage industry (Packaging and waste disposal).

Output 2.5.3: Rural industrial processing of livestock and fish increased by 20% and 30% respectively.

Activities to develop rural industries in processing of livestock and fisheries include:

- a) Identify potential investors and support them to set up livestock and fishery cottage industries.
- b) Identify suitable sites and provide necessary utilities/facilities (District Assemblies).
- c) Build capacity and facilitate ITTU and other fabricators to fabricate appropriate machinery for livestock and fish processing.
- d) Enforce byelaws on hygienic environment and food safety within the cottage industry (Packaging and waste disposal).

Component 2.6: Support to Urban and Peri-Urban Agriculture

Urban agriculture using waste water and water bodies in cities and towns is common in Ghana as in other countries of the world. Intensive urban farming in open spaces is taking place all-year-round in Ghana's three main cities of Accra, Kumasi and Tamale and it is market-oriented.

Urban and peri-urban agriculture (UPA) makes a significant contribution to a variety of foods in urban markets. In Kumasi, 90% of all lettuce and spring onions consumed are produced from open-space vegetable farming in the city and in Tamale and Accra, about 80% and 10% respectively of cabbage found on the markets are produced from the open-space farming in the cities (IWMI, 2002). UPA also contributes to employment, livelihoods and poverty alleviation. Plot sizes range between 0.01ha and 0.2 ha in urban areas and 0.1 to 0.8 ha in peri-urban areas. The plot sizes in urban agriculture are, in general, diminishing as a result of the action of estate developers and dredging of main drains. Declining soil fertility due to lack of fallow periods is another problem. The main source of irrigation water is untreated wastewater from open drains or polluted water from streams and rivers and also shallow wells.

Although many benefits are derived from UPA, the production is often associated with health risks, and as a result, there are restrictions on farmers. Section 51, subsection 3 of the local government act 462 (1993) generally allows urban farming activities without prior permit from the District/Metropolitan) Planning Authority. However, city bye-laws, e.g., the Accra Metropolitan Assembly (AMA) bye-laws (growing and sale of crops) 1995, restrict urban agriculture on land outside one's premises (open-space farming) to a mandatory registration with the metropolitan officer of health with the intention to maintaining good sanitary conditions in the city.

Farmers face constraints of access to land and quality water for irrigation. Restrictive regulations

from local government authorities and rapid urbanisation pose significant challenges to UPA as a means of livelihood. Fresh vegetables produced from UPA are often contaminated with pesticides because of improper application.

Development issue:

Potential for urban and peri-urban agriculture as source of income is under-exploited and threatened.

Output 2.6.1: Output from peri-urban agriculture increased by 20%.

Activities earmarked to increase generation from urban and peri-urban agriculture include the following:

- a) Liaise with Metropolitan, Municipal and District authorities to zone areas within urban and peri-urban areas for agricultural activities.
- b) Identify owners and potential users of such lands for agricultural purposes and discuss and agree on conditions of use.
- c) Monitor and enforce the use of the lands as per agreements.
- d) Train peri-urban producers in good agricultural practices (GAPs).
- e) Conduct Tuberculosis and Brucellosis screening in the peri-urban milk collection areas.
- f) Organise mass vaccination, endo and ectoparasitic interventions against the endemic diseases in the peri-urban areas.

3.5 Programme 3: Increased Competitiveness and Enhanced Integration into Domestic and International Markets

Ghana's economy has performed relatively well over the years and with the discovery of oil in commercial quantities, disposable incomes of the people are likely to increase substantially. Ghanaians and residents are therefore likely to demand more and better products. The agricultural sector will thus need to position itself to take advantage of the situation to improve its competitiveness. There are also several new opportunities emerging in the international market. The global food crisis can be turned into an opportunity for the agricultural sector to turn its comparative advantage in the production of several products into competitive advantage. The essence of this programme is to enhance the capacity of semi-commercial and commercial smallholders and other operators to produce for the international and expanding domestic markets, including agro-industry.

The degree of commercialisation varies according to type of crop or livestock and agro-ecological zone. Commercialisation refers to the proportion of the quantity of commodity produced that is sold. Analysis of commercialisation levels among producers of selected staple crops; based on the GLSS V data shows that groundnut has the highest rate of commercialisation of 69%. Sorghum and millet have low rates of 25% each. Market participation for households with small holdings, while generally less than that of large holders, has been shown to be significant. That notwithstanding, there is no doubt that levels of commercialization of most agricultural commodities in the country are very low. Most livestock owners, for cultural and security reasons, do not have a commercial orientation for keeping livestock.

The market access constraints that producers of staple crops and livestock face are poor infrastructure such as bad roads and decrepit market structures, limited access to information, and rudimentary processing facilities. Stiff competition from imported produce also limits the domestic market for Ghanaian produce.

Ghana's export diversification strategy in agriculture is based on the horticulture industry, of which the key commodities are pineapples, chillies, Asian vegetables, mangoes, papayas and bananas. The market access challenges for this industry are competitiveness in price, quality and volumes; the changing trends in sourcing by international buyers; and increasing number of quality standards. Other challenges include limited production and post-production infrastructure; and poor management, logistics, and promotion.

Smallholder participation in export crop production supports the country's export diversification drive; for example prior to the introduction of MD2 pineapple variety, about 40% of pineapple exports were from smallholder farmers. The trends in international agricultural trade pose a challenge to participation of smallholders (because of the small-scale and scattered nature of production, the low use of inputs, limited access to required technology, and limited access to market information).

Interventions for domestic markets have been suggested under the rural infrastructure component of Programme 2 of this Plan. Those interventions will also support production for export markets. In addition, staple crops will have to be promoted strongly.

There are several initiatives from government, donors and the private sector to meet the export market challenges. These initiatives such as Export Marketing and Quality Awareness Project (EMQAP) and Export Development and Investment Fund (EDIF) need to be scaled up to meet changing needs of the industry. The integration of smallholders into international markets will have to be through lead firms that have access to markets. Government will need to facilitate that linkage and provide the enabling environment for the industry, plus linkages to firms that have the technical capacity for production and exports. The industry is private sector-led and government will provide infrastructure of public goods nature and facilitate export trade through promotion, information generation and dissemination, support for meeting quality standards, appropriate legal framework and enforcement of regulations.

This programme has one component and complements interventions to be pursued under rural infrastructure, food storage and distribution, and mechanisation elaborated under Programmes 1 and 2.

Component 3.1: Marketing of Ghanaian Produce in Domestic and International Markets

Development issues:

1. Low levels of local market penetration by smallholder men and women farmers.
2. Low capitalization of traders (especially those who bulk produce at the local level).
3. Poor grading and standardization system.
4. High consumer preference for imported commodities that have local substitutes.
5. Inadequate volumes with the required specifications and quality to supply the international markets.

6. Limited capacity to fully comply with international Sanitary and Phytosanitary (SPS) standards.

Output 3.1.1: Marketed output of staple crops by smallholders increased by 50% by 2015.

In order to address the issue of low levels of domestic market penetration by small holder farmers the following set of activities will be implemented:

- a) Identify successful lead firms/agro-industries and apply viable model(s) of linkage with smallholders that have been developed by USAID-TIPCEE, GTZ-MOAP and others.
- b) Facilitate capacity building of farmers on market driven production.
- c) Develop realistic GAPs for domestic marketing of agricultural produce, especially for stakeholders in the linkage models.
- d) Collaborate with Metropolitan, Municipal and District Assemblies, traders etc. to implement GAPs.
- e) Design and launch a market promotion programme for import substitution commodities (e.g. rice, chicken, cooking oil etc).
- f) Lobby supermarkets, hotels and restaurants to participate in selected commodity value chains with a smallholder production base.
- g) Enforce anti-dumping regulations.
- h) Develop Ghana GAP.
- i) Educate farmers on demand driven production.

Output 3.1.2: Export of non-traditional agricultural commodities by men and women smallholders increased by 50% by 2015.

In order to address the issue of low levels of export market penetration the following set of activities will be implemented:

- a) Identify successful lead firms with access to assured export markets and apply viable model(s) of linkage with smallholders that have been developed by USAID-TIPCEE, GTZ-MOAP and others.
- b) Design sustainable programmes to support the certification of smallholders for export markets.
- c) Establish a channel of communication to discuss and find solutions to the concerns of private sector (appropriate infrastructure and incentives).
- d) Develop branding of Ghanaian produce for international markets.
- e) Make information on Ghanaian firms widely available on the web.
- f) Build capacity of PPRSD and allied institutions to ensure compliance with international standards.
- g) Strengthen the ITD in MOFA especially as a link to MOTI and the GEPC.
- h) Build capacity and adequately resource relevant stakeholders for international trade negotiations.

Output 3.1.3: Grading and standardization systems of agricultural commodities (crops, livestock and fish) made functional and effective by 2012.

The set of interventions which are programmed to address the issue of poor grading and standardisation systems in the country include the following:

- a) Develop grading and standardization systems for commodities that do not have grades and standards.
- b) Promote the adoption of grading and standardization systems for all commodities for both domestic and export markets.
- c) Enforce laws and regulation on standards and grading:
 - Liaise with relevant agencies to enforce grades and standards.
 - Strengthen capacity of enforcing agents.
 - Create awareness on grades and standards.
 - Review penalties for violations of laws and regulations.
- d) Develop effective processing and packaging systems for crops, livestock and fisheries.
- e) Promote the use of marks and labels in the identification and marketing of standardized produce.
- f) Regulate and certify the export/import of pets, animals in the wild (reptiles, fishes and birds) and their products such as skins and hides.
- g) Strengthen the capacity of VSD to carry out regulatory activities and to ensure compliance with international trade and safety standards of OIE and SPS etc.

3.6 Programme 4: Sustainable Management of Land and Environment

In an agrarian economy, such as that of Ghana, Sustainable Land Management (SLM) is a prerequisite for an enhanced production, food security, incomes and livelihoods for its present and future generations and the maintenance of ecosystem integrity. However, land degradation has been, and continues to be, a major threat to the estimated 150,000km² agricultural land, which is about 63% of the total land area of Ghana. Indeed land degradation has since the 1990s become a major developmental issue in terms of its impacts on poverty alleviation, food security and economic growth.

Ghana's agriculture is natural resource-based, with extensive crop and livestock production systems, hunting, rain-fed agriculture, and fish from natural water bodies. Traditional practices such as bush burning, and the improper use of technologies such as irrigation and agro-chemicals do not engender sustainability of resource use. Severe erosion also occurs in all the agro-ecological zones and the savannah regions are affected the most. This is a result of the intensity of rainfall and soil factors.

In order for agricultural production to be sufficient to meet the demands of the ever-growing population in the country, the impact of the climate must be understood and integrated into the sector activities. Better information improves knowledge and helps devise good policies and sound agricultural management practices. This in turn would increase the resilience of production systems to inter- and intra-seasonal climatic variations and to global climate change. Fora for communicating progress on data collection and availability on climate related issues would be strengthened. This will be done in collaboration with Ghana Meteorological Agency.

Efforts should not only be to assist farmers to adapt to climate change impacts but should also encourage them to undertake mitigation measures (e.g. minimize or reduce the sector's emission

of green house gases into the atmosphere). This can be achieved through a suite of technologies and management practices such as no-till, cropland management, planting of perennials, etc. Responses to the impacts of climate change on agriculture needs to include not only the development of new agro technologies, water management systems and farm practices, but also investment in infrastructure and logistics to facilitate the development of these adaptive agricultural systems. There should be capacity building programmes for extension officers and subject specialists on current climate related issues. Soil improvement technologies should be given high consideration and the introduction of extreme weather (drought/flood) tolerant crop species in all agro- ecological zones in addition to the introduction of high-yielding and short-duration crops varieties.

Past efforts by governments and its partners at promoting land management and conservation have yielded some positive results; however, scaling up of these SLM practices has been faced with a number of barriers, including cost and limited access to relevant inputs within an environment of limited credit, and land tenure systems that do not favour investments in improvements to land. An Agricultural Land Management Strategy has been developed as a tool to address these barriers so as to better integrate land management practices in the programmes of the agricultural sector. The present sector plan therefore adopts the Agricultural Sustainable Land Management Strategy for implementation. This programme consists of one component. The objectives and outputs are presented below.

Component 4.1: Awareness Creation and use of SLM Technologies by Men and Women Farmers

Development issues:

1. Weak policy environment for sustainable land management at the community level
2. Low capacity at all levels for implementation of SLM policies as they affect agriculture.
3. Low adoption of SLM technologies at community level.
4. Most SLM activities in communities are of pilot nature.
5. Weak collaboration of relevant agencies to ensure SLM mainstreaming.

Output 4.1.1: Policies and regulations to support SLM at all levels reviewed and strengthened by 2012.

The set of interventions programmed to improve on the policy environment for sustainable land management at various levels are:

- a) Subject all new policies, programmes, projects and plans to sustainability test using strategic environment approach.
- b) Review and update Land Planning and Soil Conservation Ordinance 2 (1953) and its amended Act of 1957.
- c) Strengthen and pass bye-laws to support community level SLM activities
- d) Mainstream sustainable fisheries management into the design of policies and programmes.
- e) Monitor compliance with management measures.

Output 4.1.2: Institutional capacity at all levels within the food and agriculture sector built to support the promotion of SLM by 2015.

The following set of activities will be implemented to address the issue of weak institutional capacity for sustainable land management at all levels:

- a) Strengthen capacity of the Environment and Land Management Unit of MOFA to take the lead and responsibility for promoting and implementing SLM agenda.
- b) Establish technical position for environment and land management at the regional level within MOFA.
- c) Establish cross – sectoral SLM coordination mechanisms at all levels (governmental, DPs and civil society).
- d) Establish mechanisms for joint planning and implementation for SLM at district level.
- e) Enhance the capacities of private extension service providers in approaches to climate change adaptation and mitigation processes.
- f) Train staff at all levels on rudiments of integrated watershed management.
- g) Develop and pilot SLM based farmer-field-school curriculum.
- h) Integrate SLM principles into curriculum of Agriculture Colleges by 2012.
- i) Train at least 12 land management specialists at post graduate level by 2015.

Output 4.1.3: Technology dissemination and adoption for scaling-up of SLM promoted by 2015.

The set of interventions programmed to address the issue of low adoption of Sustainable land management technologies at the community level are:

- a) Develop and implement sustained awareness creation programme on environment and land degradation at all levels.
- b) Facilitate the development and implementation of 50 community land improvement plans annually.
- c) Facilitate the dissemination and adoption of SLM technologies at the farm level in all regions.
- d) Facilitate the implementation of 40 integrated watershed development programmes in selected micro-catchments by 2015.

Output 4.1.4: SLM knowledge to support policy and investment decision making generated and adequately managed by 2015.

Activities to strengthen the policy environment include:

- a) Establish baseline information (disaggregated) database on land degradation and SLM practices.
- b) Establish and update baseline information for fisheries management.
- c) Establish an integrated natural resource management, and monitoring and evaluations system.
- d) Produce at least 12 SLM related research findings by 2015.
- e) Document and publicize successful SLM interventions.

Output 4.1.5: An effective, efficient and motivating incentive system for SLM established by 2012.

In order to transform Sustainable Land Management interventions from pilot schemes into full-fledge interventions, the following set of activities are programmed for implementation:

- a) Targeted grants made available to support farmers switching to SLM.
- b) Existing credit systems expanded to support SLM investments.
- c) A comprehensive payment scheme for environmental services provided through adoption of SLM technologies developed and functional.

3.7 Programme 5: Science and Technology Applied in Food and Agriculture Development

Sustainable modernisation of the food and agriculture sector can only occur when productivity and production improvements are based on strategic thinking, science and technology. However, uptake of research output has been low partly due to top-down approach to research. The introductions of the RELC concept and the Competitive Agriculture Research Grant Scheme (CARGS) have proven to be effective ways of promoting demand driven research. However, low levels of funding have constrained the success of participatory research. Under this Programme, the GoG will improve the level of funding to agriculture research. The funds will be targeted at key development areas (crops, livestock, fisheries and socio-economic research) through Competitive Grant Scheme (CGS).

In 2001, the Government of Ghana legislated changes to CSIR's mandate and operations with a view to addressing private-sector issues and introducing market principles. The legislation introduced a private-sector funding target of 30 percent of each agency's budget. To date, only the Oil Palm Research Institute (OPRI) reached this goal. Socially oriented agencies under CSIR are significantly less well-placed to generate their own funds than the more commercially oriented agencies. Government and donor contributions remain the primary sources of funding for agricultural research in Ghana. Private-sector involvement in agricultural research would be enhanced to improve funding and demand driven research.

The National Agricultural Research System (NARS) in Ghana is comprised of the research institutes under the Council for Scientific and Industrial Research, the Cocoa Research Institute, and the Faculties and Schools of Agriculture, as well as the departments of botany, zoology and food sciences of the country's universities. CSIR has the formal responsibility for advising government on science and technology policy. The establishment of a competitive grant scheme since the National Agricultural Research Project has increased collaboration across the various CSIR agencies and between CSIR agencies and the universities. Cooperation also exists between the government and higher-education agencies on the one hand, and regional and international agencies on the other. CSIR also undertakes several collaborative research projects with various centers of the Consultative Group on International Agricultural Research (CGIAR). The NARS has the benefit of other research work from the West Africa sub-region through WECARD/CORAF and the Africa region as a whole through FARA.

This programme has two components.

1. Uptake of Technology along the Value Chain and Application of Biotechnology in Agriculture

2. Agricultural Research Funding and Management of Agricultural Research Information

Component 5.1: Uptake of Technology along the Value Chain and Application of Biotechnology in Agriculture

Development issues:

1. Low uptake of agricultural technology.
2. Limited application of biotechnology and its benefits.
3. Poor coordination/collaboration of institutions/disciplines involved in research along the agriculture value chains.

Output 5.1.1: Adoption of improved technologies by men and women along the value chain increased by 25% by 2015.

The set of interventions which are programmed to address the issues of low uptake of agricultural technology along the value chain are:

- a) Conduct participatory research work that is informed by needs of new technology users along the value chain.
- b) Build the capacity of field officers, producers and other stakeholders in the use of new technologies.
- c) Conduct on-farm research into low cost appropriate technologies and deliver them as packages.
- d) Deliver existing technologies as packages to farmers.
- e) Support development of private sector input distribution network.
- f) Intensify field demonstrations/field days/study tours to enhance adoption of improved technologies.

Output 5.1.2: Laws and regulations to enhance the application of biotechnology in agriculture in place and assessment of the country's biotechnology research potential by 2015.

In order to address the issues of limited application of biotechnology, it is programmed to carry out the following activities:

- a) Dialogue with relevant MDA for passage of bio-safety bill.
- b) Assess the biotechnology research potential of the country's research system.
- c) Conduct Information Education Campaign (IEC) on biotechnology application.

Component 5.2: Agricultural Research Funding and Management of Agricultural Research Information

Development issues:

1. Limited funding of agricultural research.
2. Poor management of agricultural research information.

Output 5.2.1: Increased number of agricultural technologies developed by 2015.

In order to address issues related to low funding of agricultural research, the following sets of interventions are programmed:

- a) Dialogue with DPs and Ministry of Finance and Economic Planning to agree on appropriate funding mechanism for agricultural research (e.g. CGS).
- b) Dialogue with private sector to fund agricultural research.
- c) Facilitate for the establishment of an Agricultural Research Fund.
- d) Revise the Science and Technology policy in line with current agriculture policy framework.

Output 5.2.2: Research Extension Linkage strengthened and made functional by 2012.

The set of interventions which are programmed to address the issue of poor management of agricultural research information include:

- a) Establish a platform for discussion on the modalities for mainstreaming.
- b) Develop and implement a sustainable funding mechanism for RELC activities.
- c) Review present RELC guidelines to make them more functional as a two way information exchange.
- d) Design and implement a program to sensitize researchers on gender mainstreaming in research.
- e) Identify and resource an appropriate unit to house a modernised (ICT-based) agriculture library.
- f) Contact all agricultural research outfits in the country for information of on-going research and outputs of completed research and continue to link with them for the purpose of sharing research output.
- g) Mandate District Directors to periodically supply information on all research activities being undertaken in the district (by local and foreign researchers) and to obtain outputs of such research for the agriculture library.
- h) Make information accessible to interested stakeholders using ICT.
- i) Strengthen the veterinary laboratories in Accra and Pong Tamale to conduct research into the production of bivalent New Castle Disease (ND) and fowl pox vaccine in order to improve rural poultry production.
- j) Carry out potency test on all vaccines imported and locally produced at PANVAC in Ethiopia.

3.8 Programme 6: Improved Institutional Coordination

Programmes and projects perform below expectations due to ineffective institutional partnering and coordination. The agricultural sector is a very wide one involving several MDAs and non-MDAs. There is, thus, need for effective partnering, collaboration and coordination. Institutions and agencies within and outside MOFA need to partner and network to be able to successfully implement the Plan.

Directorates and agencies within MOFA as well as other MDAs, non-governmental organizations, DPs, civil society and the private sector need to strengthen their linkages. A communication strategy is essential to facilitate information sharing and formalise regular

meetings between directorates, agencies and others within and outside MOFA.

- d) Adapt appropriate human resource management software to provide information on staffing levels (with qualifications) at all levels.
- e) Make proposals to training institutions (Universities etc) to review curricula in line with sector needs.
- f) Establish a system of succession in all directorates.
- g) Undertake a needs assessment of the human, material, logistics and skills resource requirements of all directorates (national, regional and district) of MOFA.
- h) Develop a scheme for agriculture staff development under the decentralised system.
- i) Recruit required staff of directorates.
- j) Procure necessary material and logistics requirements of directorates.
- k) Undertake required training according to needs assessment in all directorates.
- l) Facilitate and coordinate youth in agriculture training programmes in the country.
- m) Provide vocational agricultural training to prospective farmers at the Farm Institute.
- n) Coordinate, monitor and evaluate all MOFA staff training programs to ensure relevance and cost effectiveness.
- o) Incorporate irrigation training into prospective farmer and staff of MOFA training.
- p) Provide agricultural technical training to middle level managers at the agricultural colleges.
- q) Collaborate with local university agricultural faculties for MOFA staff graduate and post graduate training.
- r) Coordinate and monitor agricultural training in private sector agricultural institutions.

Component 6.2: Inter-Ministerial Coordination

Development issue:

Weak inter-MDA and MMDA coordination.

Output 6.2.1: A joint platform for collaboration between MOFA and other MDAs established and strengthened by end of 2012.

The set of interventions which have been programmed to address the issue of weak inter-agency collaboration include:

- a) Develop and implement an inter-ministerial communications strategy and conform to civil service guidelines with respect to inter-ministerial coordination.
- b) Train staff to use existing framework at policy and technical level, (NDPC, Local Government Service and Civil Service) for coordination.
- c) Introduce at least bi-annual joint planning and review sessions to ensure alignment of plan and budgets across MDAs.
- d) Strengthen collaboration with Ghana Health Service (GHS), the security agencies such as the police, immigration, and CEPS.
- e) Train sector MDAs in budgeting and allocation of resources for the implementation of the sector plan.

Component 6.3: Partnership With Private Sector and Civil Society Organizations

The strategy of government is to have a private sector led agricultural development. However, despite pronouncement of intent, there is no formal link or platform of engagement of private sector with MOFA. Similarly there are a number of NGOs implementing agriculture projects and programmes in the country that have no formal working relationship with MDAs, but interact extensively with extension staff. In line with Sector Wide approach there is the need to bring this vital group on board and in particular to align their activities in order to constructively contribute to sector goals and targets.

Development issue:

No formal platform for engagement of private sector and civil society with agriculture sector agencies.

Output 6.3.1: A platform for private sector and civil society engagement with MDAs established by end of 2011.

The set of activities which have been planned to improve upon engagement between the public and private sectors include the following:

- a) Organise consultative meetings with private sector and civil service organisation on policy and in planning processes.
- b) Publicise policy and sector plan to private sector and civil society entities.
- c) Facilitate the review and enactment of relevant laws and regulations that provide an enabling environment for private sector and civil society agricultural activities.
- d) Establish communication channels for consultations between private sector and civil society with MDAs at the national, regional and district levels.

Component 6.4: Coordination with Development Partners

Development issues:

1. Varied financial management, procurement, monitoring and evaluation systems.
2. Weak domestic ownership of intervention.
3. Agricultural SWAp not fully effective to attract DP support (even though FASDEP II and METASIP are acceptable to DPs, procurement and financial management procedures are yet to be negotiated. That needs urgent attention).

Output 6.4.1: MOFA-DPs coordination and collaboration strengthened and DPs and MDAs fund a common agriculture strategy by 2011.

In order to harmonise financial management and procurement arrangements of donor partners the following activities have been programmed:

- a) Apply the Ghana Aid Policy for Sector-DP coordination meetings (MOFA co-chairs).
- b) Institutionalise joint planning and sector review.
- c) Negotiate and conclude procurement and financial management procedures by 2011.
- d) Sign MOU on SWAp with development partners by 2011 and implement road map.
- e) Formalise and strengthen MOFA-DP quarterly meetings.

Chapter 4

RESULTS FRAMEWORK

The results framework captures the completed matrix of the first, second and third level of results, indicators, baselines and targets for the plan implementation period i.e. 2011-2015. The effective implementation of the framework will ensure that information is provided on whether interim targets are being achieved on the way to the longer-term outcome. The results framework will thus provide the basis for planning, resource allocation and will be frequently consulted and considered during the process of managing towards the desired outcomes.

In the current plan, 2008 and 2009 information was used as baseline. This was derived from various data collection across the sector. Where baseline data is not available for a particular indicator, it is stated as such and efforts will be made to fill these data gaps by PPMED through further review of secondary data.

Details of the Results framework are shown below:

Table 10 : RESULTS FRAMEWORK

Programme Development Objective	Outcome Indicator	Baseline (2008)	Target (2011 - 2015)	Frequency of Data Collection
<i>Modernized agriculture, structurally transformed economy, food security, employment and reduced poverty attained.</i>	Percentage agricultural sector GDP growth rate	5.1%	At least 6% annual growth rate	Annually
	Change in food self-sufficiency levels		Achieve at least 85% food self sufficiency	Annually
	Percentage Value of non-traditional agricultural exports	196.5 million dollars	50% increase over baseline	Annually
Intermediate Results	Results Indicator for each component	Baseline (2008)	Target	Frequency of data collection
Programme 1: Food Security and Emergency Preparedness				
Increased yields of smallholder farmers	Quantity of produce per Ha: Maize	1.7Mt/Ha	50% increase over baseline	Annually

Intermediate Results	Results Indicator for each component	Baseline (2008)	Target	Frequency of data collection
Programme 1: Food Security and Emergency Preparedness				
	Sorghum	1.2Mt/Ha	50% increase over baseline	Annually
	Cassava	13.5 Mt/Ha	50% increase over baseline	Annually
	Yam	14.1Mt/Ha	5% increase over baseline	Annually
	Cowpea	1.1Mt/Ha	25% increase	
Production of poultry increased	Quantity of poultry produced	31,853Mt	20% increase over baseline	Annually
Production of small ruminants and pigs increased	Quantity of small ruminants and pigs produced.			
	Pig	17,002Mt	25% increase over baseline	Annually
	Sheep	15,831Mt	25% increase over baseline	Annually
	goats	17,180Mt	25% increase over baseline	Annually
Production of cultured fish increased	Quantity of cultured fish produced	10,000Mt	50% increase over baseline	Annually
Reduced levels of underweight and stunting in children	Percentage decrease in levels of underweight and stunting in children under five years		Underweight and stunting reduced by 50%	Annually
	Stunted	28%		
	Severely stunted	10%		
	Under weight	14%		
	Severely under-weight	3%		

Increased number of people below the poverty line engaged in off-farm livelihood activities	Percentage increase in number of people below poverty line engaged in off-farm livelihood activities	GLSS V indicator as baseline	5% of people below the poverty line supported to engage in off-farm livelihood activities.	Annually
Reduced post harvest losses along the maize rice, sorghum, cassava, yam and fish value chains	Percentage reduction in post harvest losses along the value chain:			
	Maize	35.1%	30% decrease from baseline	Annually
	Rice	6.9%	35% decrease from baseline	Annually
	Cassava	34.6%	40 % decrease from baseline	Annually
	Yam	24.4%	50% decrease from baseline	Annually
	Sorghum		20% decrease from baseline	Annually
	Fish		30% decrease from baseline	Annually
Private sector capacity developed for grain storage	Quantity of grains stored by private sector		50,000 Mt of grains stored annually 25,000 Mt of grains processed annually	Half Yearly Half yearly
Reduced number of food insecure households	Percentage reduction in food insecure households	GLSS V indicator as baseline	20% decrease over baseline	Half Yearly
Improved water management systems developed	Area of small/ micro-scale irrigation systems developed	27,702.5Ha	Develop additional 22,590Ha by 2011	Annually

	Area of sustainable water harvesting schemes developed in Ghana		62,000Ha developed by 2011	Annually
	Number of feasibility studies for large scale irrigation schemes developed	13		Annually
Mechanisation centers established and functional in each administrative district	Number of mechanization centers established	69	170	Half Yearly
A system of incentives for agro-processing industries developed	Number of incentive packages developed for agro-processing industries			Half Yearly
Programme 2: Increased Growth In Incomes				
Increased income from cash crop production	Percentage increase in incomes from crop production		30% increase over baseline	Annually
Increased income from livestock rearing	Percentage increase in incomes from livestock		25% increase over baseline	Annually
Increased income from fish culture	Percentage increase in incomes from fish culture	10,000Mt	60% increase over baseline	Annually
Reduced post harvest losses of mango, plantain pineapples, tomatoes, papaya and citrus	Percentage reduction in post harvest losses of selected horticultural crops and plantain		25% to 50% decrease over baseline	Annually
Increased production from bee keeping, mushroom and snail farming	Number of products developed from bee keeping, mushroom and snail farming		20% to 50% increase over baseline	Annually

New commercially viable products developed from staple, horticultural, livestock and fish products	Number of new products developed from agricultural products		8 new products developed (2 each from staple crops, horticultural crops, livestock and fisheries)	Annually
Pilot value chains developed	Number of pilot value chains developed in each ecological zone		2 selected commodities in each agro-ecological zone	Annually
Outgrower schemes developed and FBOs strengthened	Number and output of outgrower schemes developed Number of FBOs strengthened and access services – financial services, market information, etc			Annually
Fish farmers Associations developed and Community based fisheries management committees established	Number of fish farmers Associations developed Number of Community based fisheries management committees established			Annually
Reduced cost of transportation of agricultural produce	Percentage reduction in cost of transportation of agricultural produce		5% reduction over baseline situation	Annually

Increased industrial processing of agricultural produce	Percentage increase in industrial processing of agricultural produce: cassava oil sheanuts cashew soybeans Groundnut Livestock Fish		20% 20% 40% 30% 30% 30% 20% 30%	Annually
Increased output from peri-urban agriculture	Percentage increase in output from peri urban agriculture		20% increase over baseline	Annually
Programme 3 : Increased Competitiveness and Enhanced Integration into Domestic and International Markets				
Increased product marketing of staple crops by smallholders	Percentage increase in marketed output of staple crops		50% increase over baseline situation	Annually
Increased export of non-traditional export crops	Percentage increase in export of non-traditional export crops Pineapple yam Mango Pawpaw Banana Fish and sea food	35,134mt 20,842mt 858mt 968mt 69,779mt 40,025mt	50 % increase of (all exports)over baseline situation	Annually
Grading and standardization systems of agricultural commodities made functional	Number of grading and standardization systems made functional		3 for crop sub-sector 1 for fisheries sub-sector 2 for livestock sub-sector	Annually

Programme 4: Sustainable Management of Land and Environment				
Enabling environment for sustainable land management created	Number of policies, laws and regulations reviewed.		All existing laws, policies and regulations reviewed	By end of 2011
Institutional capacity developed for SLM at all levels	Number of staff trained for SLM Number of people to whom technologies have been disseminated in respect of SLM		All district staff 100% increase over baseline situation	Half Yearly
Programme 5: Science and Technology Applied in Food and Agriculture Development				
Increased adoption of technologies along the value chain	Percentage increase in technology adoption along the value chain		25% increase over baseline situation	Annually
Laws and regulations to enhance the application of biotechnology passed	Number of laws enacted to enhance application of biotechnology	Nil	2	Annually
Increased number of agricultural technologies developed	Number of Agricultural technologies developed		15	Annually
Programme 6: Improved Institutional Coordination				
Capacities of staff developed at national, district levels for planning, policy analysis implementation, monitoring and evaluation	Number of staff trained in policy analysis, planning and M&E.		All district MOFA technical staff All Regional MOFA technical staff All technical staff of MOFA National Directorates	Half Yearly

Capacities of staff developed in financial and procurement management processes.	Number of staff trained in financial and procurement management processes		All financial management staff All Directors at District, Regional and National levels.	Half Yearly
Communications strategy developed and implemented	Number of messages packaged for dissemination by the communications Unit		Number per month	Half Yearly
Joint platform for collaboration between MOFA and other MDAs established	Number of joint planning sessions organised		Number per quarter	Half Yearly
A platform for collaboration between MDAs and civil society created	Number of joint planning sessions organised between MDAs and civil society		One per quarter	Half Yearly
MOFA – Development Partner collaboration strengthened	Number of joint planning and decision making sessions organised		One per quarter	Half Yearly

Chapter 5

COST EVALUATION AND FINANCING PLAN

5.1 Introduction

Implementation of the plan to reach the goals set for the agriculture sector requires a significant financial commitment from the public sector. This chapter presents estimates of the cost of implementing the programmes set out for METASIP. The cost estimates are public sector expenditure to be incurred above existing commitments to recurrent costs and investment for ongoing programmes. They do not include operational cost such as personal emoluments and administration of the implementing agencies. The cost of private sector response to the investment opportunities created by Government initiatives is excluded. The plan, however, does provide an indication of the extent of collaboration and expected responsiveness of the private sector and can be used as a basis for estimating private sector responsive cost. It also provides the direction of proactive responsibility expected from all directorates under MoFA and agriculture related MDAs towards the development of agriculture in Ghana. The plan, however, excludes the cost of the cocoa subsector.

5.2 Implementation Cost

The costs of implementing the investment plan were estimated by analyzing the activities set out in Chapter 3. The costing structure corresponds to the hierarchy of programmes, components, sub components and activities, providing clear analytical links from the principal goal for the agriculture sector to objectives for the six programmes, to expected outcomes for activities and to inputs. Input costing was applied wherever possible using inputs estimated by lead agencies. Where input costing was not possible, judgement was applied to estimate costs for activities. The resulting cost estimates for the investment plan are indicative, precise estimates will become available only when detailed implementation plans and feasibility studies are completed.

Table 11 shows the incremental cost of implementation for all six programmes of the agriculture sector investment plan for both MoFA and other agricultural related MDAs. The estimates are expressed in constant 2010 prices.

Table 11 : METASIP Expenditure Estimate (GHC million)

Programme/ Component		Year					Total
		2011	2012	2013	2014	2015	
Programme 1: Food Security and Emergency Preparedness							
1.1	Productivity Improvement	33.3	72.2	14.5	14.0	2.1	136.1
1.2	Support for Improved Nutrition	2.3	4.2	4.2	0.2	0.2	11.1
1.3	Support for Diversification of Livelihood Options for the Poor with Off-farm Activities Linked to Agriculture	2.2	7.3	6.5	5.5	0.5	22.0
1.4	Food Storage and Distribution	0.1	0.4	0.7	0.3	0.0	1.4
1.5	Early Warning Systems and Emergency Preparedness	3.4	1.3	1.3	1.3	1.3	8.7
1.6	Irrigation and Water Management	11.1	64.9	85.0	103.6	21.6	286.2
1.7	Mechanization Services	20.0	20.0	20.0	20.0	20.0	100.0
Total Programme 1		72.3	170.4	132.3	144.9	45.6	565.6
Programme 2: Increased Growth in Incomes							
2.1	Promotion of Cash Crop, Livestock and Fish Production for income in all ecological zones	53.2	43.8	52.6	22.7	12.9	185.1
2.2	Development of New Products	2.1	2.0	2.0	2.0	2.0	10.2
2.3	Development of Pilot Value Chain for Two Selected Commodities in Each Agro-Ecological Zones	40.7	40.5	40.5	40.4	40.3	202.4
2.4	Intensification of FBOs and Out-grower Concepts	1.5	1.5	0.9	0.2	0.2	4.3
2.5	Development of Rural Infrastructure	94.9	96.6	86.4	86.4	86.2	450.3
2.6	Urban and Peri-urban Agriculture	0.3	0.3	0.2	0.2	0.2	1.4
Total Programme 2		192.6	184.8	182.6	151.8	141.8	853.70
Programme 3: Increased Competitiveness and Enhanced Integration into Domestic and International Markets							
3.1	Marketing of Ghanaian Produce in Domestic and International Markets	5.3	4.7	4.6	4.6	4.5	23.6
Total Programme 3		5.3	4.7	4.6	4.6	4.5	23.6
Programme 4: Sustainable Management of Land and Environment							
4.1	Awareness Creation and Use of SLM Technologies by Men and Women Farmers	1.6	6.8	6.6	6.5	6.5	27.9
Total Programme 4		1.6	6.8	6.6	6.5	6.5	27.9
Programme 5: Science and Technology as Applied in Food and Agricultural Development							
5.1	Uptake of Technology along the Value Chain and Application of Biotechnology in Agriculture	0.4	0.5	0.6	0.3	0.3	2.1
5.2	Agricultural Research Funding and Management of Agricultural Research Information	10.0	10.0	10.0	10.0	10.0	40.0
Total Programme 5		10.4	10.5	10.6	10.3	10.3	52.1
Programme 6: Improved Institutional Coordination							
6.1	Institutional Strengthening for Intra-ministerial Coordination	0.2	0.3	2.4	0.3	0.4	3.6
6.2	Inter-ministerial Coordination	0.2	0.3	0.2	0.3	0.2	1.2
6.3	Partnership with Private Sector and Civil Society Organizations	1.0	0.5	0.5	0.5	0.5	3.0
6.4	Coordination with Development Partners	0.7	0.3	0.3	0.2	0.2	1.8
Total Programme 6		2.1	1.3	3.4	1.3	1.4	9.6
Total METASIP		284.3	378.5	340.1	319.4	210.1	1,532.4
Total Investment Cost		282.1	375.9	337.6	316.9	207.6	1,520.1
Total Recurrent Cost		2.2	2.6	2.5	2.5	2.5	12.3

Achievement of the full potential impacts will require expenditure additional to that estimates for METASIP, in a range of areas. Investment in infrastructure such as power, water and communications will be needed to ensure efficient operations of the private sector within the Government's market-oriented policy stance.

5.3 Funding Sources

The funding requirement for METASIP is estimated as GHC 1,532.4 million over five years. The Government intends meeting the costs through domestic and international sources. Domestic sources include (i) increased budget allocation from the Government; (ii) recovery of costs for parts of the METASIP; and (iii) other internally generated funds.

The Government intends increasing its spending on agriculture development to reach the target of 10 per cent of its total budget, as agreed in the Maputo Declaration.

In the 2009 fiscal year, Government spent GHC 781.4 million for the agriculture sector (including cocoa), which represented 9.0 per cent of its total spending. Lifting the proportion of its spending to agriculture to 10 per cent would therefore require an increase of about 10 per cent over the 2009 figure. Government budget allocation for expenditure categories of agriculture (crops and livestock), fisheries, agriculture-related research and feeder roads (roads to farmer areas) in 2009 was GHC 630.0 million. The scope of those four categories corresponds closely to that of METASIP. A 10 per cent increase in Government expenditure on the agriculture sector “across the board” would thus result in an additional GHC 63.0 million being made available annually for METASIP. This base allocation of additional funds for METASIP for 2009 is assumed to grow conservatively at 6% annually.

METASIP proposes spending very significant amounts on private/public partnerships to reduce the cost of capital and stimulate market-oriented investments. Government investment would be recovered, at least in part, from the private sector partners who would include FBOs. The volume of outlays to be recovered will be determined as agreements are reached with private sector partners. The investments concerned would include development of facilities for agribusiness in storage and processing (to cost about GHC 200.0 million) and equipment for mechanization services to be operated by entrepreneurs and FBOs (to cost about GHC 100.0 million). Assuming that cost recovery runs at 30 per cent of the total in the first year after investment and at 20 per cent in each of the next two years (thus averaging 70 per cent of all outlays), the Government would recover about GHC 132.0 million from its partners within the life of METASIP (Table 12).

MOFA recovers costs of providing goods and services as “internally generated funds (IGF)” which currently run at some GHC 5.0 million per year. An assumption that IGF will increase in proportion to the increase in expenditure resulting from METASIP is suitably conservative. METASIP would add, on average, about 30 per cent to MOFA spending, suggesting that IGF would rise by about GHC 1.5 million annually from 2011.

Likely sources of funds and the commitment to METASIP are shown in Table 12. It is estimated that the funding gap for the investment programme is about GHC 1,016.0 million (Table 12).

Table 12 : METASIP Funding Proposal, (GHC million)

Source	Year					Total
	2011	2012	2013	2014	2015	
Government of Ghana Increased Allocation	66.8	70.8	75.0	79.5	84.3	376.4
Cost Recovery: Private/ Public Partnerships		18.0	30.0	42.0	42.0	132.0
Other Internally Generated Revenue	1.5	1.6	1.7	1.8	1.9	8.5
Total Funds from Domestic Sources	68.3	90.4	106.7	123.3	128.2	516.9
Estimated METASIP cost	284.3	378.5	340.1	319.4	210.1	1532.4
Funding Gap	216.0	288.1	233.4	196.1	81.9	1015.5

5.4 Priority Investments

A set of priorities is drawn from the overall investment plan. Highest priority is given to actions which directly impact on farm production to achieve the objectives of Programmes 1 and 2 and the outcomes of their components. Only those activities in the other Programmes considered urgent to support Programmes 1 and 2 are included in the priority investment plan. The priority investments and their tentative cost estimates are listed by programme and component in the costing working document and summarized in Table 13. The listing is to show priority thematic areas and subjects for consideration by Government and the DPs. In practice, packaging of projects and programmes would result in the combination of some activities and the inclusion of activities listed in other parts of METASIP. Consideration is also given to the fact that there are ongoing activities from components not prioritised that support the priorities.

Table 13 : Priority Investments

		Year					Total
		2011	2012	2013	2014	2015	
Programme 1: Food Security and Emergency Preparedness							
1.1	Productivity Improvement	19.1	18.2	2.4	0.4	0.4	40.5
1.2	Support to Improved Nutrition	4.0	4.0	2.0	0	0	10.0
1.3	Support for Diversification of Livelihood Options for the Poor with Off-farm Activities Linked to Agriculture	2.2	7.2	6.2	5.2	0.2	21.0
1.5	Early Warning Systems and Emergency Preparedness	1.0	2.3	0.3	0.3	0.3	4.2
1.6	Irrigation and Water Management	8.0	51.0	53.0	69.0	27.0	208.0
1.7	Mechanization Services	20.0	20.0	20.0	20.0	20.0	100.0
Total Programme 1		54.3	102.7	83.9	94.9	47.9	383.7
Programme 2: Increased Growth in Incomes							
2.1	Promotion of Cash Crop, Livestock and Fish Production for income in all Ecological Zones	45.0	30.0	35.0	15.3	0.5	125.8
2.3	Development of Pilot Value Chain for Two Selected Commodities in Each Agro-Ecological Zones	40.0	40.0	40.0	40.0	40.0	200.0
Total Programme 2		85.0	70.0	75.0	55.3	40.5	325.7
Programme 4: Sustainable Management of Land and Environment							
4.1	Awareness Creation and Use of SLM Technologies by Men and Women Farmers	1.2	6.6	6.0	5.8	5.4	25.0
Total Programme 4		1.2	6.6	6.0	5.8	5.4	25.0
Programme 5: Science and Technology as Applied in Food and Agricultural Development							
5.1	Uptake of Technology along the Value Chain and Application of Biotechnology in Agriculture	10.0	10.0	10.0	10.0	10.0	50.0
Total Programme 5		10.0	10.0	10.0	10.0	10.0	50.0
Total METASIP Priority Investments		150.5	189.3	181.9	166.0	96.8	784.5

Chapter 6

FINANCIAL AND ECONOMIC ANALYSIS

The analytical work for the design of the METASIP identified high positive returns from investing in agriculture that contributed to the transformation of the economy. It was established that agricultural growth potentials exist in Ghana, exemplified by significant gaps of about 50% between achievable and current yields for many crops. Results of analysis show that by closing the yield gaps, together with reasonable growth achieved in all sub- sectors, Ghana will be able to reach the goal of 6 percent annual agricultural growth with emphasis on increased productivity rather than area expansion.

Accelerating agricultural growth to six percent per year and its spillover effects to non-agricultural sectors also accelerates poverty reduction. Under CAADP growth scenario, the analysis suggest that by 2015, the national poverty rate will fall to 12.5 percent and the rural poverty rate will fall to 17.5 percent. This is substantially lower than the projected 23.2 percent in doing business as usual scenario. This translates into an additional 850,000 people, mostly from rural areas, who will move out of poverty under the CAADP simulation by 2015. There is the need to support staple crops as an important driver of growth and as the commodities of the northern sector and also for poverty reduction. Sustained growth through productivity improvement will support other sectors, for example, materials for industry, transfers from lower food prices, foreign exchange earnings, freed labour and thereby the structural transformation agenda for the country.

A financial and economic analysis study conducted in 2008 to inform the implementation of FASDEP II also came up with observation and recommendations which include continuous capacity building required to address operational challenges, enhancing commitment and encouragement from Government to stay on course on project objectives. The studies noted that some benefits were difficult to quantify whilst others would take longer time to materialize. Continuous support of agriculture by strengthening program management structures and systems, including extension and research linkages will help sustain the gains. The sector plan has elaborated a programme for institutional strengthening to improve the management and coordination functions of MOFA. Already a close collaboration exists between MOFA and Ministry of Finance and Economic Planning (MOFEP) which paves the way for commitment to institutionalise tracking of expenditure allocation.

The major factors that were likely to affect the sustainability of interventions included the following:

- Ability of farmers to earn alternate income during gestation periods
- Availability of credit to finance counterpart funds and purchase of inputs
- Availability of affordable complementary services
- Stability of market prices for agriculture products

Financial and economic analysis to provide specific estimates of returns to components and interventions will be done when implementation plans are being rolled out. At this stage of the investment plan and for such a central level document, the overall benefits have been presented.

Chapter 7

IMPLEMENTATION MECHANISM

7.1 The Objective of the Implementation Strategy

The objective for operation and implementation is to create a performance based system with the participation of key stakeholders based on principles of effective policy dialogue, review and shared responsibility; strengthened and expanded partnerships; alliances including regional (ECOWAS and AU) complementarities; and cooperation to boost growth.

The review and dialogue processes under the CAADP agenda operate at three different levels:

1. **Mutual Review at the Continental Level:** There are two main mechanisms for review and dialogue at the continental level. The first is the African Partnership Forum (APF), which targets African leaders and their G8 partners and is supported by a technical secretariat at the Organisation for Economic Co-operation and Development (OECD). It is a forum for dialogue and review, at the highest level, with respect to programme performance and progress across the broad NEPAD agenda. The second mechanism, the CAADP Partnership Platform, focuses more specifically on the CAADP agenda. It brings together representatives of the leading Regional Economic Communities (RECs) and other regional organisations dealing with agriculture, major bilateral and multilateral development agencies, and private-sector and farmers' organisations.
2. **Peer Review at the Regional Level:** The leading RECs facilitate dialogue on and review of the CAADP implementation agenda through two distinct processes. The first regroups country representatives at the level of permanent secretaries and directors of planning. It focuses primarily on a collective review of implementation performance in individual countries and mutual learning to spread and accelerate progress toward CAADP goals and targets. The second process allows the leadership of the RECs and representatives from the private sector, farmers' organisations, and development agencies to track programme progress and performance at the regional level and align development assistance and country policies and strategies with the CAADP targets and principles.
3. **Progress Review at the National Level:** Country-level implementation requires a transparent, broad, and inclusive dialogue and review process to ensure that policies and programmes, including budgetary policies and development assistance, are aligned with the sector policy and investment plan and are on track to meet objectives.

The Implementation Strategy at the national level identifies the various stakeholders that will be responsible for ensuring the effective implementation of the METASIP, the various levels of governance, the arrangement for engaging stakeholders at the various levels and the functions of the levels in implementation.

In order to ensure effective stakeholder participation and coordination, a country team, policy dialogue fora and a Strategic Analysis and Knowledge Support System (SAKSS) will be established at the national level. Participation will include organisations who were signatories to the CAADP Compact. The Compact stipulates the agreement of the signatories to coordinate their activities for the implementation of the Food and Agriculture Sector Development Policy (FASDEP II) agenda in the six policy objectives through the interventions in its Medium Term

Agriculture Sector Investment Plan (METASIP) to achieve and exceed the 6% Comprehensive African Agriculture Development Programme (CAADP) growth target by 2015. The FASDEP II spells out policy principles and expected roles of stakeholder groups for implementation.

Based on the national decentralisation policy, MOFA will facilitate coordination of partnerships at the national, regional and district levels in a framework of regular dialogue, planning and reviews.

Four (4) levels of implementation governance are proposed at the national level to ensure the smooth implementation of the METASIP. These are:

- a) Steering Committee
- b) Policy Dialogue Fora
- c) A National Strategic Analysis and Knowledge Support System (SAKSS)
- d) A Secretariat.

The guiding principles for implementation governance are:

- a) Building on existing institutional provisions
- b) Not to create parallel structures
- c) Using as much as possible mainstream mechanisms for sustainability
- d) Ownership by the lead MDAs to ensure sustainability
- e) Participation of key groups under the compact
- f) Enhancement of complementarities among partners
- g) Stakeholder groups will facilitate networking of their members and grassroots participation
- h) Institutional roles and capacities to leverage skills and build on synergies

7.2 Implementation governance

7.2.1. Steering Committee

The composition of the Steering Committee includes the signatories to the Ghana CAADP Compact:

- a) Key Ministries (represented by MOFA, MOFEP and NDPC)
- b) Parliamentary Select Committee on Food, Agriculture and Cocoa Affairs
- c) Key Private sector (signatories to CAADP Compact – National House of Chiefs, Food Security and Advocacy Network (FOODSPAN), Ghana Agricultural Workers' Union (GAWU), Farmer Based Organisations (FBOs), & Private Enterprise Foundation (PEF).
- d) Agriculture Sector Development Partners
- e) Financial Institutions
- f) Research/academia

The roles and responsibilities of the Steering Committee include:

- a) Promote and facilitate agriculture related awareness and participation of stakeholder groups.
- b) Adopt annual work plans.
- c) Identify opportunities and constraints to improve impact of strategic analysis and knowledge support system (SAKSS) node on the sector.
- d) Support resource mobilization for the sector.

- e) Advise Sector Minister on adjustments in policy direction, planning objectives and operational strategies.

7.2.2 Policy Dialogue

This will include the expanded membership of the Steering Committee

The TOR for Policy Dialogue includes:

- a) Mid term review of annual workplan.
- b) Dialogue on challenges and arrive at consensus to guide planning and implementation.
- c) Build competencies to make growth happen in the sector
- d) Facilitate networking of members and grassroots participation
- e) Review internal processes to become efficient
- f) Enhance capacity of organisations to cooperate and complement each other
- g) Facilitate transfer of technology and innovation

Stakeholder groups

For the purpose of METASIP implementation, the interests of the public sector (government) in the implementation of the plan under the compact will be represented by:

- a) Development Partners – currently represented by 13 agencies who endorsed the signing of the Compact.
- b) Parliament – through the Parliamentary Select Committee on Agriculture and Cocoa Affairs who also endorsed the compact.
- c) Government – represented by MOFA and MOFEP with a larger membership of agriculture sector related ministries – Ministry of Local Government and Rural Development (MLGRD), Ministry of Trade and Industry (MOTI), Ministry of Environment, Science and Technology (MEST), Ministry of Road and Transport (MRT), Ministry of Lands and Forestry (MLF), Ministry of Health (MOH), Ministry of Education (MOE), National Development Planning Commission (NDPC).
- d) Research and Development Institutions – through the Council for Scientific and Industrial Research (CSIR), Kwame Nkrumah University of Science and Technology (KNUST), University of Ghana and the University of Cape Coast and other institutions and the National Agricultural Research System (NARS), West and Central Africa Council for Agricultural Research and Development/Council Ouest et Centre Africain pour la Recherche et le Développement Agricoles (WECARD/CORAF), Forum for Agricultural Research in Africa (FARA) and Consultative Group for International Agricultural Research (CGIAR) systems.

For the purpose of METASIP implementation, the interests of the private sector in the implementation of the plan under the compact will be represented by:

- a) Farmer Based Organisations, led by the Ghana National Association of Farmers and Fishermen (GNAFF), Peasant Farmers Association, Farmers Organisation Network of Ghana (FONG), Apex Farmers Organisation of Ghana (APFOG), National Farmers and Fishermen Award Winners Association. These organisations will facilitate the strengthening of FBO's in the country including formalizing an apex body to participate in effective dialogue with government and other partners and at the regional and international level.
- b) Private sector enterprises – through the Private Enterprises Foundation (PEF) and its 6 associations and their members – Federation of Association of Ghanaian Exporters, Association of Bankers, Ghana Employers Association, Chamber of Commerce,

- Chamber of Mines and Association of Ghana Industries.
- c) Civil Society through the Food Security and Advocacy Network (FOODSPAN), representing (at the time of compact signing) 40 organisations across the country including NGOs and think tanks and the Ghana Agricultural Workers Union which has membership across the 10 regions of Ghana.
- d) Traditional Rulers - through the National House of Chiefs representing all the 10 regions of Ghana and also through the Regional House of Chiefs each representing the traditional authorities in each political region of Ghana.

Detailed institutional roles will be defined to leverage skills and build on synergies and agreements will subsequently be established such as a SWAp MoU to manage partnerships.

7.2.3 Strategic Analysis and Knowledge Support System (SAKSS)

The SAKSS will include institutions in the National Agriculture Research System, local think tanks and others. In accordance with the founding principles of CAADP, the national node will be built around networks of institutions and existing experts. Lead Institutions will be identified to coordinate thematic groups on the issues for implementation and enhancement of the 6 METASIP programmes and activities.

The fundamental principle in constituting these thematic groups is to ensure the adherence to quadruple helix representation i.e. representation from policy institution, knowledge institution, private sector and civil society. The aim is to forge collaborative linkages among the stakeholders and to enhance complementarities of roles. Furthermore, the key criteria for proposing institutions to address the tasks of the key components include (i) the mandate/ functions of the institution or organisation, (ii) the availability of experts (iii) institutional experience and competence. In order to effectively address the SAKSS Node tasks, the working groups' tasks will cut across four main components of strategic analysis, knowledge management, capacity building and coordination and governance.

The roles and responsibilities of the SAKSS will include the following:

- a) Draft and adopt TORs
- b) Adopt technical reports
- c) Ensure that work plan is implemented
- d) Ensure that the SAKSS program remains relevant to the planning and implementation of METASIP
- e) Provide input to the sector planning process
- f) Improve the quality of design and implementation of policies and strategies
- g) Link up with ReSAKSS West Africa
- h) Identify information gap for implementation
- i) Conduct studies to improve on strategic objectives and options
- j) Enhance thematic area dialogue.

7.2.4 Secretariat

The Secretariat will facilitate coordination, information generation, processing and dissemination for the Steering Committee, the SAKSS and the Policy Dialogue Group. The composition will include professionals and administrative support.

The Secretariat will manage the day- to-day operations in close liaison with the implementing entities.

Chapter 8

POLICY IMPLICATIONS

Policy implications for enhancing the thrust of agricultural growth require that existing agriculture laws and regulations be reviewed to facilitate more private sector participation in the sector. In this respect, a number of laws and regulations have been indentified and discussions are ongoing with relevant agencies on the commitment strategy. A participatory process, involving relevant stakeholders will be adopted for the review as well as the legislation drafting processes. Issues requiring action are presented below:

Table 14: List of issues that require legislative action

Subsector	New areas identified requiring legislation
Crops	Regulation of the horticulture industry
	Agriculture germ- plasm conservation and protection
	Agriculture land management
	Ornamental agriculture
	Regulation for domestic market requirements
	Regulation to ensure data collection from private sector
	Livestock
Monitoring of hatcheries and production of quality day-old chicks	
Range utilization and management	
Livestock and poultry welfare <ul style="list-style-type: none"> • Mode of transporting live animals over short and long distances • Housing of livestock • Cruelty to work animals (especially donkeys and bullocks) used for ploughing and ridging • Tethering pigs to graze (especially in Northern Ghana) 	
Meat inspection	
An Act or Legislative Instrument on veterinary service fees and charges and establishment of a revolving fund for vaccine bank at the Veterinary Headquarters in Accra	
Fisheries	

Engineering	Standardization of food processing plants including food grade machinery and equipment
	Standardization of power/implement according to soil types/ecological zones
	Standardization of machinery and equipment spare parts to facilitate repairs and maintenance
	Certification of operators of agricultural machines to safe guard against environmental degradation
	Use of cooling vans for the transportation of perishable crops
	Standardization of pack houses
	Water quality for peri-urban agriculture
Irrigation	Quality standards for irrigation dams
	Regulation of importation of irrigation equipment
	Regulation of the design of dams by individuals, design certification and ensuring they are constructed to the specifications.
Food	Regulate display of produce at the market, e.g. food to be displayed on platforms or tables and not on the floor
	Ensuring Packaging of ready to eat foods. E.g. gari, sugar
	Food should be prepared under strict hygienic conditions
	The packaged products should be well labelled with content of ingredients and marked with production and expiry dates
	Discouraging/banning selling of rotten vegetables and fruits
Human Resource	Accreditation of private agriculture colleges
Statistics	Collection and use of data within the agriculture sector

Chapter 9

SAFEGUARD MEASURES

9.1 Introduction

Agriculture influences considerably the management of natural resources, including land, forest, water and genetic biodiversity. Land degradation through poor agricultural practices reduces land productivity and limits poverty reduction. An effective policy would enhance the positive influences through carbon sequestration, contribution of tree cover for conservation and improved quality of soil, protection of watersheds, and enhancement of the beauty of natural landscapes.

Against this background, there is the need to mainstream environmental issues in policies, plans, programmes and other strategies through the conduct of a strategic environmental assessment (SEA). This is aimed at addressing the impacts of these interventions at the earliest stage of development, to avoid the consequences at a later period. In view of this, a SEA was conducted on FASDEP II. The assessment focused on the four main areas of sustainability, i.e. natural resources, socio-cultural issues, economic issues and institutional issues.

9.2 Findings and Recommendations of the SEA⁴

The SEA made a number of findings and recommendations some of which strategies have already been incorporated in this plan to address them. Key findings of the SEA are as follows:

9.2.1 Policy Objectives Inconsistencies

A number of inconsistencies between some of the policy objectives were identified. These have the potential to undermine the sustainability of the benefits of FASDEP II. The following are recommended to address such inconsistencies:

Sustainable land management practices should be strictly adhered to

Training of extension officers and farmers in Sustainable Land Management practices should be carried out

There is the need for a comprehensive land use plan and the use of the crop suitability map during the implementation of FASDEP II

9.2.2 Policy Objectives and the Poor

Value addition and price increases

The strategies for achieving food security and emergency preparedness as has been proposed will benefit the poor. However, when there is value addition to food, the cost is likely to go up to levels that the poor may not be able to afford. Strategies must be put in place to cushion the poor and the vulnerable against such high cost regimes.

Resistance to Relocation

The preparedness of the poor to move when there is an early warning may not be guaranteed due

⁴Full document on the SEA can be obtained at the Ministry of Food and Agriculture

to potential resistance to relocation in many situations.

Access to Credit

Increased growth in incomes is expected to improve the livelihoods of the poor and vulnerable. However, the poor have no access to credit in order to expand their farms and or livestock. Strategies, for ensuring that the poor have access to credit, and other farming inputs will benefit the poor. Access of the poor to market must also be enhanced.

Capacity of the Poor to Compete

The capacity of the poor to compete at the domestic and international levels must be enhanced. The policy to increase competitiveness will not benefit the poor and the vulnerable unless several programmes are put in place to enhance their competitiveness.

Sustainable Land Management

Sustainable Land Management will enhance the quality of life of the poor and vulnerable. The implementation of this policy is key to sustainable agriculture and has the potential to minimise waste in the sector.

Application of Science and Technology

The application of science and technology will enhance agriculture production through the use of modern equipment, crop varieties and irrigation facilities. Science and technology will also make it easier for large tracts of land to be put under cultivation which may result in pushing the poor to marginal and unproductive or degraded lands. This is likely to affect the quality of life of the poor.

Institutionalization of environmental management issues

Policy strategies principally directed at institutional improvements have very weak linkages with poverty and environment. This has serious implications for sustaining or institutionalizing measures to improve sustainable use of environmental resources and poverty reduction. Measures must be adopted to institutionalize environmental management issues particularly through procedures, requirements, and management units.

9.2.3 Skills Development

Strategies for improving institutional coordination are generally not targeted at people perhaps due to its intention to strengthening institutional structures and improving the legal and regulatory regime for food and agricultural development. There is however the need to ensure that the skills of personnel in key institutions are enhanced to ensure the achievement of this objective.

9.2.4 Land Use Planning and Agricultural Development

Poor land use planning poses a challenge to agriculture development among others. Conflicting land use practices are being implemented, for example, prime agricultural land are being used for housing projects, sand and gravel winning for road and building construction and land fill sites. This is a grey area in Ghana's development process. It is therefore important that the linkages between agriculture and land use are well established and strategies devised to strengthen such linkages.

9.2.5. Policy Strategies and Environment

Policy strategies linked to proper environmental management were limited; it is therefore important to mainstream environmental issues across all policy objectives.

9.2.6. Cross Sectoral Linkages

The effective implementation of the FASDEP II is dependent on the strength of critical linkages between the agriculture sector and other sectors such as health, energy, transport, water etc. which is recognized in policy formulation. Effective consultation and institutional mechanisms and procedures are required to ensure that such cross-sectoral overlaps are properly addressed during implementation.

9.2.7. Climate Change and FASDEP II

Climate change is not only an environmental problem but also a developmental issue. Since the climate change impacts will be felt now and in the future, the implementation of all policies strategies under FASDEP II should seriously give consideration to these impacts. Appropriate adaptation and mitigation measures should be given serious consideration during the formulation and implementation of future sector policies. In order to ensure sustainability of projects to meet national goals, it is strongly recommended that national projects should take advantage of the benefits of the Clean Development Mechanism.

The SEA of the FASDEP II provided an important vehicle for mainstreaming environmental issues within the Agricultural Sector policy, plans and programmes. The success of mainstreaming requires institutional changes to accommodate environmental management within the sector.

There is also the need to build adequate capacity for environmental management within the sector. The SEA has built some initial capacity in mainstreaming environment into sector policies, plans and programmes. It is important that a programme be designed to build upon and update this capacity.

It is also imperative to further strengthen collaboration between stakeholders both within and outside the sector in order to address cross sectoral issues and linkages.

Comprehensive monitoring and evaluation plan has to be developed with the sector institutions to determine the level of mainstreaming.

Chapter 10

INSTITUTIONAL ASSESSMENT

The Agricultural sector in Ghana faces a new set of emerging challenges which the FASDEP II seeks to address. The linear approach to technology generation and dissemination is giving way to innovation systems approach to agricultural research for development impacts. The productivity focus of individual commodities has broadened to include their value chains. Subsistence farmers are increasingly seeking to connect with regional and international markets. Private sector is playing a greater role in input and output markets and in food processing. MOFA is operating under a decentralized system which is yet to operate fully. Development partners are changing their funding strategy accordingly from project support to budgetary support. All these changes call for reorientation of institutions in the Agricultural Sector - individual units, departments, and agencies of MOFA as well as other agricultural related MDAs to effectively contribute to its mission and goals.

In view of the above, a Public Expenditure and Institutional Review (PEIR) was conducted and completed in 2008 as one of the studies to inform implementation of the FASDEP II with recommendations for follow-ups. It is intended that this exercise will be updated annually. This has also been reinforced under the MDBS process and an inter-agency committee has been set up to report on agriculture expenditure.

Additionally, a functional review is ongoing in MOFA and is intended to be carried out also for sector agencies under the METASIP Programme 6 on improved institutional coordination.

The result will be a capacity-building plan, identifying the main human resource gaps and the scale and scope of capacity building required. There are also efforts in public financial management to computerise and link expenditure reporting to planned activities.

In the framework used for the institutional assessment of MoFA in the PEIR, the organizational capacity and incentives of the ministry were seen as constituted by three key elements: 1) its institutional relationships, 2) the resources it has at its disposal, and 3) its management. In conclusion, the review suggests that MoFA should address constraints in four key areas:

- Strategic direction and results orientation in the ministry that focuses on closing productivity gaps of key crops in the sector to strengthen competitiveness and improve natural resource management
- Improved intra and inter-organizational linkages and processes to strengthen development, assessment and dissemination of technologies to more effectively bring science and technology to bear on the problems and opportunities in the sector
- Improved human resource management practices that make better use of capabilities, enhance organizational learning, and offer opportunities for professional growth; and increased thrust on demonstrating the returns to investments, which will help in articulating the need for expenditures in the sector

As part of the capacity building arrangements for the current plan, activities have been programmed to address the four areas outlined above in Chapter 3 of this document under Programme 6 “*Improved Institutional Coordination*”.

Chapter 11

MONITORING AND EVALUATION

11.1 Introduction

Monitoring and evaluation of the performance of the sector's programmes and institutions helps to increase their effectiveness and provides increased accountability and transparency during programme implementation. With respect to this Agriculture Sector Plan, there is need to provide adequate, accurate and timely information on activities by all the different stakeholders to ensure that Plan implementation achieves the desired objectives and/or that changes are made on time to ensure that the desired objectives are achieved.

11.2 Review of the Monitoring and Evaluation System in the Agricultural Sector

An elaborate M&E system for the agriculture sector in Ghana was designed in 2007 and has been in use since then. The system was formulated to support the implementation of all programmes and projects in the agricultural sector and establish their impact.

The M & E system has been used to assist in undertaking the following actions at the national level:

- a) Preparation and dissemination of annual reports
- b) MOFA-DP joint performance reviews
- c) Support of programmes and Project implementation and policy formulation.
- d) Serves as inputs for NDPC's Annual Progress Report (APR).

The agriculture sector M & E system has faced a number of challenges among which are:

- a) Inadequate skilled staff in implementing the M&E system
- b) The M&E system is based on a technology which is unreliable (Poor Internet connectivity).
- c) High staff attrition
- d) Inadequate computers and software for data capture.

11.3 Strengthening the Current M&E System under the Sector Plan

11.3.1 Overall goal and specific objectives

The overall goal of the sector M&E system is to facilitate the tracking of progress and effectiveness as well as identify implementation challenges associated with the sector plan.

Specifically, the objectives are;

- a) To enhance institutional arrangement with adequate capacity to support effective monitoring and evaluation of the plan.
- b) To strengthen and effectively coordinate the current system for monitoring and evaluating the effectiveness of the sector service delivery.
- c) To evolve an effective system for collecting reliable, relevant and timely data for information generating information for planning and budgeting.
- d) To manage an effective feedback system that makes information available in usable systems.
- e) To improve coordination of all stakeholders including private sector in the plan

- implementation.
- f) To design a holistic approach to M&E which captures all stakeholders including the private sector.

11.3.2 Institutional Arrangements

The main institutions involved in the M&E system include; the office of the President, Parliament, NDPC, MOFEP, Ghana Statistical Service, MDAs, Civil Society and NGOs .

The responsibility for coordinating the sector M&E system rests with the PPMED of MOFA in collaboration with other PPMEDs of the other MDAs in the sector.

11.3.3 Co-ordination

Information flow is necessary for effective monitoring at all levels. It therefore requires effective and efficient coordination among all key stakeholders as mentioned above. The existing system will therefore be upgraded to support the Sector Plan implementation.

11.3.4 Evidence based M&E

Essentially, evidence based M&E system ensures holistic approach to M&E that monitors input, processes, outputs and outcomes of programmes/projects. The indicators are disaggregated to various levels for proper tracking of sector plan results. During implementation, data, reports and surveys will form the bases for developing of additional indicators for the sector plan.

PPMED of MOFA together with the Ghana Statistical Service will lead in the collection and collation of data across all the institutions.

The current feedback mechanism through the Ghana Statistical Service has some flaws in producing the statistics to meet the wide range of needs. The limited data available through census and surveys are underutilized.

This feedback system will be strengthened to make information available to all end users. The Excel software will be used for the compilation and dissemination of indicators required for monitoring the plan.

11.3.5 Participatory M&E

In the implementation of the METASIP, a participatory M&E approach will be used by deploying all the knowledge and resources of a wide range of stakeholders including MDAs, MMDAs, Private sector and CSOs. Regular bulletins will be prepared and disseminated in addition to APRs. The report will summarise the movement of significant indicators during the plan implementation period.

11.3.6 Data Quality Assessment/Review

A multi-pronged approach would be adopted to ensure data quality. MOFA Data Quality Reviews will assess data collection, analysis, and dissemination systems to determine the utility, objectivity, and integrity of the information. The recommendations resulting from the reviews will help to constantly improve collection, processing, and dissemination of data. Additional elements will include capacity building efforts for programme implementers and others responsible for collecting and reporting data. The capacity building initiatives will be upstream interventions aimed at strengthening implementers' data collection systems and controls to reduce the possibility of data quality problems occurring when data are actually collected and

reported. A third element is encouraging constant use of data that are gathered and reported to the Ministry of Food and Agriculture. Widespread use will quickly highlight data discrepancies thereby identifying areas where improvements are required.

Data Quality Reviews will cover all data reported in the M&E Plan, including data submitted by implementers and any surveys financed through the Ministry of Food and Agriculture and donor supported MOFA programs. Generally, both *ex-ante* and *ex-post* data quality reviews will be conducted. The *ex-ante* will examine data collection, processing, storage, analysis and dissemination systems that implementing entities and secondary data providers have put in place. Weaknesses identified will be documented and recommendations for improvement will be made. *Ex-ante* reviews, for instance, will be done for implementing agencies before they start any serious data collection and will involve at a minimum an assessment of the readiness of these establishments to collect and report quality data. Baseline data will be validated as part of *ex-ante* through feasibility studies, surveys and data collection.

The *ex-post* reviews will examine processes and mechanisms put in place by implementing entities and secondary data providers in the collection, processing and storage of data for analysis and dissemination of results on Program activities. Data quality issues identified will be documented and recommendations will be made for improvement to assure data quality in future. Services of independent Data Quality Reviewers will be sought when necessary to enhance the data quality review process. The PPME Directorate will lead the Data Quality Review process.

Chapter 12

RISK ASSESSMENT

Table 15 shows the identified principal risks to components for all six programmes of the agriculture sector investment plan. Further detailed risks will be identified as projects and activities are planned in detail prior to their implementation.

No risks that are severe enough to result in the failure of a component are identified at this stage. The plan includes measures to mitigate risks which are classified as medium (M) and low (L).

Table 15: Risk Assessment of METASIP

	Risk	Severity of Risk	Mitigation Measures
Programme/ Component			
Programme 1: Food Security and Emergency Preparedness			
1.1	Productivity Improvement		
a.	Farmers might not accept improved crop technologies	M	- Improvement to extension services - Strengthening FBOs
b.	Degradation of land and water resources might constrain productivity increases	L	- Sustainable land management programmes (Programme 4)
c.	Crop pests and diseases might prevent productivity raising	M	- Disease monitoring and early warning system development (Component 1.5)
d.	Farmers might not accept improved livestock technologies	M	- Improvement to extension services - Research to find best technology packages
e.	Animal diseases might prevent increase in productivity	M	- Vaccination services - Improved monitoring and diagnosis
f.	Farmers might not adopt fish culture	L	- Provision of advisory services - Assistance to farmers to use communal waters and to create ponds
g.	Introduction of short duration and high yielding varieties may lead to loss of indigenous varieties	M	- Bio- diversity conservation strategies should be put in place
h.	Risk of glut due to high production volumes	M	- Development of marketing systems - Development of entire value chain
1.2	Support to Improved Nutrition		
a.	Suitable nutritious foods might not be available	L	- Assistance and extension services for producers
b.	Underweight and stunted children might not be provided with nutritious food	L	- National nutrition campaign - Schools food programmes
1.3	Support for Diversification of Livelihood Options for the Poor with Off-farm activities Linked to Agriculture		
a.	Suitable enterprises opportunities might not be available	L	- Extensive market research and product studies
b.	Farmers might lack funds for investment	M	- Direct support for reducing the cost of capital
1.4	Food Storage and Distribution		
a.	Post harvest losses might remain high	M	- Research into handling methods - Training for value chain actors - Investment in value chain development
b.	Markets might not be integrated	M	- Investment in value chain development - Improvements to roads - Investment in market centres
c.	High cost of post management practises could lead to low adoption	L	- Promotion of affordable post management technologies
d.	Chemical use in post harvest management could pose a threat to human health	M	- Promotion of safe handling and use of chemicals
1.5	Early Warning Systems and Emergency Preparedness		
a.	Information of pest and disease threats might not be available for dissemination	L	- Creation of pest and disease monitoring system
b.	Farmers might not receive information on pest and disease threats	L	- Creation of dissemination system through all media
c.	Resistance of the poor to relocate when there is early warning	L	- Education and awareness creation

1.6	Irrigation and Water Management			
a.	Irrigation facilities might be inadequate	L	-	Rehabilitate Tono and Veve schemes
			-	Construct new facilities for 25,000 hectares
			-	Rehabilitate dams in Great Accra and Volta
			-	Water harvesting programmes
			-	Construct large schemes if proven feasible
b.	Incidence of water borne diseases	M		Education on risk of water borne diseases
c.	Potential aquatic weeds infestation	M		
d.	Conflict from unfair distribution of irrigated lands	L		Ensure equity and transparency in the distribution of land
b.	Maintenance of facilities might be inadequate	L	-	Programmes to build maintenance capacity of FBOs
1.7	Mechanization Services			
a.	Mechanization equipment might be insufficient	L	-	Private/ public partnerships for mechanization
			-	Partnership with FBOs for mechanization
Programme 2: Increased Growth in Incomes				
2.1	Promotion of Cash Crop, Livestock and Fish Production for Income in all Ecological Zones			
a.	Crop production might not be profitable for farmers	L	-	Fertilizer support programme
			-	Targeted extension services
			-	Value chain development to improve markets
			-	Market development programme
b.	Livestock production might not be profitable	L	-	Research to improve genetic quality of animals
			-	Animal supply programmes to reduce capital cost
			-	Diagnostic services to monitor diseases
			-	Vaccination services
			-	Value chain development to improve markets
b.	Fish production might not be profitable	L	-	Investment in ponds and communal waters
			-	Fingerling supply programme
2.2	Development of New Products			
a.	Niche crops might not find markets	L	-	Intensive market and product research
b.	Niche crops might not be profitable	M	-	Grant funding to reduce capital cost
			-	Advisory services for growers and processors
2.3	Development of Pilot Value Chain for Two Selected Commodities in Each Agro-Ecological Zone			
a.	Enterprises might not be profitable to investors	M	-	Government investment through private/ public partnerships
b.	Crop commodity supply might not justify new investment in agribusinesses	L	-	Substantial farmer support programmes
2.4	Intensification of FBOs and Out-grower Concepts			
a.	High instability of farmer groups	M		Development and implementation of a sustained programme for the development of FBO
2.5	Development of Rural Infrastructure			
a.	Infrastructure might not match need	L	-	Road improvements would be screened to match farmers' needs
2.6	Support to Urban and Peri-urban Agriculture			
a.	Land earmarked for urban agriculture may be competed for by other social services	M		Enforcement of regulation on land use plans and environmental management practises
Programme 3: Increased Competitiveness and Enhanced Integration into Domestic and International Markets				
3.1	Marketing of Ghanaian Produce in Domestic and International Markets			
a.	Domestic market opportunities might be limited	L	-	Intensive market and product research
b.	International markets might not be found	L	-	Intensive market and product research
		L	-	Predominant private sector responsibility
c.	Capacity of poor farmers to compete at domestic and international levels	M		Implementation of Programmes to enhance the competitiveness of the poor and vulnerable
Programme 4: Sustainable Management of Land and Environment				
4.1	Awareness Creation and Use of SLM Technologies by Men and Women Farmers			
a.	Farmers might not adopt technologies because benefits of sound environmental take long to be realised	M	-	Extensive demonstrations and advisory services
			-	Grants for preparing and implementing management plans
				Education and awareness would be sustained and be accompanied by some motivational measures
b.	Sustainable technologies might not be available	L	-	Substantial research and development programme to identify technologies

c.	Development projects and policy strategies emanating from the plan may have adverse effect on the environment	M		Conduct environmental impact analysis on projects before they are implemented
				Mainstream environmental issues across all policy objectives.
d.	Poor land use planning	M		Develop a comprehensive land use plan and the use of crop suitability map
Programme 5: Science and Technology as Applied in Food and Agricultural Development				
5.1	Uptake of Technology along the Value Chain and Application of Biotechnology in Agriculture			
a.	Technologies might not be available	L	-	Substantial research for technology development
b.	Technologies might not be adopted	L	-	Private/ public partnerships for value chain development
			-	Training for value chain actors
				Sensitisation and awareness creation on advantages and constraints of all technologies and good agricultural practises
c.	Science and technology would encourage use of large tracts of land which can result in pushing the poor to marginal and degraded land	M		Develop regulations to protect the poor
5.2	Agricultural Research Funding and Management of Agricultural Research Information			
	No significant risk			
Programme 6: Improved Institutional Coordination				
6.1	Institutional Strengthening for Intra-ministerial Coordination			
	No significant risk			
6.2	Inter-ministerial Coordination			
	No significant risk			
6.3	Partnership with Private Sector and Civil Society Organizations			
	No significant risk			
6.4	Coordination with Development Partners			
	No significant risk			

APPENDIX 1: LEAD AND COLLABORATING/IMPLEMENTING AGENCIES

Programme	Component	Lead Agency	Collaborating MDAs and MMDAs
1. FOOD SECURITY AND EMERGENCY PREPAREDNESS	1. Productivity Improvement	MOFA (PPRSD, CSD, DAES, APD, VSD)	Universities, Attorney General's Department, Ministry of Employment and Social Welfare, Ghana Input Dealers Association, Ministry of Information, Local Authorities
	2. Support to improved nutrition	MOFA (WIAD, DAES)	CSIR (FRI), Ministry of Health (Nutrition Unit), Ministry of Education, GHS, GES
	3. Support for diversification of livelihood options of the poor with Off-farm Activities Linked to Agriculture	MOFA (WIAD, AESD, Fisheries Commission, APD, DAES)	MMDAs, MOTI, NBSSI, NGOs, MESW
	4. Food storage and distribution	MOFA (DAES, CSD, PPRSD, NAFCO, FC, AESD)	MOTI, NBSSI, MMDAs, Ministry of Transportation, Ministry of Information and NGOs
	5. Early warning systems and emergency preparedness	MOFA (PPRSD, SRID, DAES, VSD, WIAD, NAFCO,)	Ghana Meteorological Agency, Ministry of Information, MMDAs, CSIR, MOTI, NADMO, GAEC
	6. Irrigation and water management	MOFA (GIDA, AESD and DAES, CSD)	Water Resources Commission, Ministry of Road and High Ways, MMDAs, EPA
	7. Mechanization Services	MOFA (DAES, AESD, WIAD, FC, CSD, APD)	MOTI, Financial Institutions, NGOs involved in Agriculture
2. INCREASED GROWTH IN INCOMES	1. Promotion of cash crop, livestock and fish production for income in all ecological zones	MOFA (DAES, CSD, AESD, VSD, APD, WIAD, FC)	CSIR, Universities, MLF, MOTI, MMDAs, NGOs, Private Companies (e.g. oil palm and cotton companies), Private sector operators, livestock producers
	2. Development of new products	MOFA (WIAD, DAES, CSD, AESD, VSD, APD, FC)	CSIR, Universities, MOTI, MMDAs, NGOs
	3. Development of pilot value chains for two selected commodities in all Agro-Ecological Zones	MOFA (CSD, DAES, VSD, APD, PP MED)	MOTI, MMDAs, NGOs, Private sector and GTZ-MOAP
	4. Intensification of FBOs and out-grower concept	MOFA (DAES, AESD, FC, GIDA, PP MED)	MOTI, MMDAs, NGOs, Private sector

Programme	Components	Lead Agency	Collaborating MDAs and MMDAs
	5. Development of rural infrastructure	MOFA (GIDA, AESD, APD)	Ministry of Roads and Highways, MOTI, MMDAs
	6. Support to urban and peri-urban agriculture	MOFA (CSD, DAES, AESD, WIAD, GIDA, APD, FC, VSD)	Local Authorities, IWMI
3. INCREASED COMPETITIVENESS AND ENHANCED INTEGRATION INTO DOMESTIC AND INTERNATIONAL MARKETS	1. Marketing of Ghanaian Produce in Domestic and International Markets	MOFA (PPRSD, CSD, DAES, PPMED, SRID)	CSIR, Universities, Attorney General's, Ministry of Trade and Industries, Ghana Export Promotion Council, Input Dealers Association, Min. of Information, Ghana Standard Board, MMDAs etc
4. SUSTAINABLE MANAGEMENT OF LAND AND ENVIRONMENT	1. Awareness Creation and Use of SLM Technologies by Men and Women Farmers	MOFA (CSD, APD, DAES, GIDA, AESD)	EPA, MLF, MLGRD, LAP, DPs, NGOs, Local Authorities, CSIR, Universities, IFPRI, GSS, Financial Institutions
5. SCIENCE AND TECHNOLOGY APPLIED IN FOOD AND AGRICULTURE	1. Uptake of Technology Along the Value Chain and Application of Biotechnology in Agriculture	MOFA (DAES, APD, WIAD, VSD, FC, AESD, GIDA, PPRSD)	CSIR, Universities, Local Authorities, GAEC
	2. Agricultural Research Funding and Management of Agricultural Research Information	MOFA (PPMED, DAES)	CSIR, Universities, Local Authorities
6. IMPROVED INSTITUTIONAL COORDINATION	1. Institutional Strengthening and Intra-Ministerial Coordination	MOFA (PPMED)	All MOFA Directorates; Headquarters, Regions and Districts
	2. Inter-Ministerial Coordination	MOFA (PPMED)	Agriculture Sector MDAs including MOFA.
	3. Partnership with Private Sector and Civil Society Organizations	MOFA (PPMED)	MOFA, Other MDAs, Men and women farmers, Private sector groups and companies, NGOs etc
	4. Coordination with Development Partners	MOFA (PPMED)	MOFA, Other MDAs, DPs

APPENDIX 2: SUMMARY OF INVESTMENT COSTS

	(GHC '000)			(USD '000)			% Foreign Exchange	% Total Base Cost
	Local	Foreign	Total	Local	Foreign	Total		
A. Food Security and Emergency Preparedness								
1. Productivity Improvement	136,148	-	136,148	95,208	-	95,208	-	9
2. Support to Improved Nutrition	11,120	-	11,120	7,776	-	7,776	-	1
3. Off-farm Livelihoods	21,993	-	21,993	15,380	-	15,380	-	1
4. Food Storage and Distribution	1,438	-	1,438	1,006	-	1,006	-	-
5. Early Warning System and Preparedness	8,665	-	8,665	6,059	-	6,059	-	1
6. Irrigation and Water Management	286,190	-	286,190	200,133	-	200,133	-	19
7. Mechanization Services	100,000	-	100,000	69,930	-	69,930	-	7
Subtotal: Food Security and Emergency Preparedness	565,554	-	565,554	395,492	-	395,492	-	37
B. Increased Growth in Incomes								
1. Promotion of Cash Crops, Livestock and Fish Production for Incomes in all ecological zones	185,147	-	185,147	129,473	-	129,473	-	12
2. Develop New Products	10,176	-	10,176	7,116	-	7,116	-	1
3. Development of Pilot Value Chain for Two Selected Commodities in all Agro-Ecological Zones	202,395	-	202,395	141,535	-	141,535	-	13
4. Intensification of FBOs and Out-growers concepts	4,305	-	4,305	3,010	-	3,010	-	-
5. Develop Rural Infrastructure	450,315	-	450,315	314,906	-	314,906	-	29
6. Support to Urban and Peri-Urban Agriculture	1,360	-	1,360	951	-	951	-	-
Subtotal: Increase in Growth and Incomes	853,698	-	853,698	596,992	-	596,992	-	56
C. Increased Competitiveness and Enhanced Intergration into Domestic and International Markets								
1. Marketing of Ghanaian Produce in Domestic and International Markets	23,573	-	23,573	16,484	-	16,484	-	2
Subtotal: Competitiveness and Enhanced Intergration into Domestic and International Markets	23,573	-	23,573	16,484	-	16,484	-	2
D. Sustainable Management of Land and Environment								
1. Awareness creation and use of SLM Technologies by Men and Women Farmers	27,930	-	27,930	19,531	-	19,531	-	2
Subtotal: Sustainable Management of Land and Environment	27,930	-	27,930	19,531	-	19,531	-	2
E. Science and Technology Applied in Food and Agriculture Development								
1. Uptake of Technology Along Value Chains and Application of Biotechnology in Agriculture	2,090	-	2,090	1,462	-	1,462	-	-
2. Agriculture Research Funding and Management of Agricultural Research Information	50,000	-	50,000	34,965	-	34,965	-	3
Subtotal: Science and Technology Applied in Food and Agriculture Development	52,090	-	52,090	36,427	-	36,427	-	3
F. Improved Institutional coordination								
1. Institutional Strengthening and Intra-Ministerial Coordination	3,615	-	3,615	2,528	-	2,528	-	-
2. Inter-ministerial Coordination	1,200	-	1,200	839	-	839	-	-
3. Partnership with Private Sector and Civil Society Organisations	3,000	-	3,000	2,098	-	2,098	-	-
4. Coordination with Development Partners	1,750	-	1,750	1,224	-	1,224	-	-
Subtotal: Improved Institutional coordination	9,565	-	9,565	6,689	-	6,689	-	1
Total Baseline Costs	1,532,409	-	1,532,409	1,071,615	-	1,071,615	-	100
Physical Contingencies	-	-	-	-	-	-	-	-
Price Contingencies	-	-	-	-	-	-	-	-
TOTAL BASELINE COSTS	1,532,409	-	1,532,409	1,071,615	-	1,071,615	-	100

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