

Climate Change Management in Agriculture: Capacity Needs Assessment

Ministry of Agriculture

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1: Introduction: Purpose and Method

Purpose

- 1.1 The government of Liberia, through the Ministry of Agriculture and the United Nations Development Programme, is embarking on a major project titled: ‘**Enhancing resilience to climate change by mainstreaming adaptation concerns into the agriculture sector in Liberia**’. This four-year project, commencing 2012, is funded by the Global Environment Facility and the Government of Liberia.
- 1.2 The first component of the project is to build capacity within the sector, so that it is better able to manage climate change. The Ministry of Agriculture commissioned a consultancy assignment to support its implementation of this capacity building work, specifically to prepare a capacity development plan. This is a report of a capacity needs assessment carried out at in the early stages of this assignment.
- 1.3 The capacity building plan is to be targeted particularly at those making policies and investment plans for agriculture; technical staff in MoA and potentially in partner Ministries/Agencies. It is also to be directed at the research and education institutions that train future staff. The total number of individuals, who are intended to benefit from capacity building, by the end of the project, is at least 190. The project’s results framework sets the following targets:

Technical staff: 60 (30 women and 30 men)

County level staff: 30 (15 in each county) (15 women and 15 men in total)

University students: 100 (50 women and 50 men)
- 1.4 Although farmers are not a direct beneficiary of the capacity development plan (Component two of the programme will provide direct support in the two pilot counties using a Farmer Field School approach) their local level needs are considered because they determine to a large extent the agenda, and hence capacity needs, of policy makers and managers.

Method

- 1.5 The approach taken to needs assessment is both ‘bottom-up’ and ‘top-down’. Because farmers are the ones who will implement adaptation initiatives, the needs assessment and resulting capacity development plan should be largely driven by the support needs of farmers and the extension/outreach people who work at the field-level. However, the Government of Liberia also wants to encourage changes in agricultural practices in line with its commitment to UNFCCC and the national policy of adaptation, as expressed in the National Adaptation Program of Action (NAPA). Government is therefore required to lead as well as support.
- 1.6 Literature on capacity needs was reviewed and a wide set of government and non-government organisations have been consulted about capacity development needs. Meetings were held in

the pilot counties of Bong and Grand Gedeh and in Monrovia, with national stakeholders, to identify and prioritise needs. The key questions addressed in these discussions were:

- What climate smart agriculture practices does the Government of Liberia want to promote?
- What are the barriers to adoption?
- How can the barriers be removed?
- What capacity is required to remove barriers?
- How much of this capacity already exists?
- How much will be provided by other projects?

1.7 A number of analytical tools were used in the assessment and these will be applicable in the ongoing project: Case studies are examined in order to identify adaptation barriers and solutions; a checklist is used to screen policies for their impacts on agricultural resilience; problem tree analysis is used to identify barriers to adaptation and institutional analysis is applied to the MoA's structure.

Structure of report

1.8 The remainder of the document is organised as follows:

- Chapters two and three consider local and national level capacity needs respectively, focussing on removing barriers to adaptation and the creation of a policy framework for agricultural resilience;
- chapter four looks at the capacity needs in education and research, emphasising the role of the two Universities in Liberia
- chapter five looks at the capacity support that is already being provided by other projects and hence the gaps for CCAAP to fill and;
- chapter six concludes by identifying priority capacity needs.

1.9 Supporting information is provided in appendices. References are provided in footnotes. Acronyms are used only after the full name has been introduced.

2: Local level capacity needs

Climate smart agriculture practices

- 2.1 There is already some experience of climate smart agricultural practices in Liberia. Farmers have developed their own coping mechanisms and Conservation Agriculture projects have been carried out in the counties of Bong and Grand Gedeh. The CCAAP projects builds on this experience, in the same counties.

Existing adaptation practices

- 2.2 A baseline study of adaptation in Gbarzon District of Grand Gedeh and Panta District in Bong counties was conducted under component 2¹. This identified and assessed adaptation practices already employed by Liberian farmers. The results are reproduced below.

Table 1: Existing adaptation strategies in pilot counties			
Climate change hazard	Current coping strategy	Effectiveness (0= ineffective, 5=very effective)	Uptake/barriers
Less reliable rains and drought:	Planting resistant rice (LAC-23 upland rice)	3	Limited awareness
Crop failure or low productivity	Increased lowland farming	5	80-85% farmers in GD site do lowland rice
Increased Temperature:	Diversification and intercropping with cassava	3	100% intercropping in Tian Town, but most farmers prefer rice.
Crop failure/low productivity of rice.	Integrated Pest Management	2	Limited awareness
Increased incidence of pests & diseases.			
More frequent heavy rain and flooding:	Reduce sand mining	1	
Crop damage by flooding.	Shift to upland farming	1	
Reduced productivity due to erosion/fertility loss	Crop rotation/ intercropping	2	Lack of extension service ²
Increased incidence of pests & diseases	IPM	2	Limited awareness
Climate Change Vulnerabilities			
Few livelihood alternatives	Mining and hunting	1	Not profitable ³
Limited access to credit	Susu credit system	1	25% of farmers have access to susu

¹ FAO Kennedy et al (2013) Needs assessment for climate change adaptation. In draft.

²This is contradicted by the earlier statement in this table that 100% take-up of intercropping has been taken up in Tian town, where the same extension service operates.

³This is not accurate: young men especially reject farming for mining, trading, taxi driver and other livelihoods

High post-harvest losses	Individual rice kitchen	1	Shaded areas less available
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Source: Component 2 Needs assessment

- 2.3 One point that stands out from this is that the combination of upland and lowland systems is important for resilience. This raises various policy issues that need to be examined further; particularly the implications for agriculture policy - which is currently focussed on moving farmers to lowland production. The CCAAP Programming document emphasises that upland multi-cropping farming system needs to be prioritized, rather than stigmatized as a crude and unproductive 'slash and burn' system. There is a need therefore to develop expertise within the MoA on what are known as analog agro-ecological systems (cropping systems that resemble natural forest).
- 2.4 One can also see from this analysis of existing coping strategies that land ownership, land tenure, and land use planning (or the lack of) can be formidable barriers to adaptation measures that involve the integration of lowland and upland systems. The implication is that those managing climate change adaptation in the MoA and elsewhere need the knowledge and skills to deal with policy and practice for complex 'systems' approaches to agriculture, and to engage with other parts of government to solve problems relating to land ownership, land use planning etc.

Proposed adaptation practices

- 2.5 A variety of adaptation practices were proposed in the baseline study conducted for component 2 of this project (see table 2):

Table 2: Proposed adaptation practices identified in pilot county baselinestudy

Climate Risks	Proposed adaptation practices	Barriers
Drought	Promote drought resistant varieties (LAC-23)	Scepticism, lack of information and training
	Rain Water Harvesting: Valley dams, reservoirs etc. to improve storage (in both lowland and upland)	Limited knowledge/awareness
	Watershed management: to maintain rain holding/release in surrounding upland areas	Limited knowledge/awareness
	Form watershed or catchment development associations, by training and organising farmers	Limited knowledge/awareness
	Crop residue retention to maintain permanent soil cover and increase soil organic content and moisture retention.	Limited knowledge/awareness
Flooding	Develop water control and drainage systems	Limited knowledge/awareness
	Watershed management to control run-off	Limited knowledge/awareness
	Form watershed or catchment development associations, by training and organising farmers	Limited knowledge/awareness
Soil erosion and reduced fertility	Promote soil and water conservation systems.	Low literacy, limited knowledge/awareness
	Promote integrated soil fertility management; e.g. green manure legumes, N-Fixing agroforestry, composting, manure application	Low literacy, limited knowledge/awareness
	Sloping Agricultural Technology (SALT)	Low literacy, limited

	including agro-forestry	knowledge/awareness
Pests & diseases	Promote pest resistant varieties	Low literacy
	Train farmers in Integrated Pest Management	Low literacy
Few alternative livelihoods	Support development of farm diversification; e.g. Rice/fish; bee keeping; poultry; food value adding	Lack of capital and credit
Limited access to credit	Strengthen savings/credit clubs, CBOs and Co-ops.	
High post-harvest losses	Improve storage facilities	Lack of existing infrastructure, Lack of capital/credit
	Improve access to markets	
	Develop processing facilities	

Source: Component 2 Needs assessment

2.6 The county-level baseline study concludes with a project framework for component 2, which recommends the following list of activities, under four outputs.

Table 3: Adaptation outputs and activities planned for county level

Output 1. County Extension system strengthened to support community based adaptation	Output2. Water control, water harvesting, irrigation	Output3. Livelihood diversification	Output4. Micro-watershed ecosystems restored/rehabilitated
Activities			
Develop FFS curriculum	2.1 Design & construct water control/drainage systems in flood-prone swamp areas	3.1 Establish 8 FFS in 2 counties	4.1 Develop a community-based watershed management plan
Develop FFS manual	2.2 Establish small-scale water harvesting in upland catchment area.	3.2 Develop FFS group skill in diversification activities	4.2 Promote soil and water conservation technologies/practices
Train FFS Facilitators and extension officers	2.3 Train farmers in water management	3.3 Support piloting/adoption of sustainable livelihood technologies/practices	4.3 Train FFS groups and watershed stakeholders
Establish mini-weather system	2.4 Form/strengthen Water User Committees	3.4 Support strengthening of savings/credit facilities	4.4 Form/strengthen watershed catchment stakeholders.
Procure transport, ICT and other equipment for planning & monitoring adaption measures			

Source: Component 2 Needs Assessment

New adaptation practices will emerge

2.7 As the county pilots proceed, it is likely that new adaptation practices (and hence capacity needs) will emerge. The international literature describes a wide set of potential adaptation practices applicable to West Africa, many of which already feature in the planning for component 2, and some of which may become applicable at a later stage (see appendix A). There is therefore a need within the project management to review practices and related capacity needs and to have the flexibility to respond to these.

What are the barriers to adoption?

Barriers at farm level

- 2.8 Lack of awareness and knowledge amongst farmers and extension workers is the most often cited barrier (see table 2). But awareness/knowledge is a first-order barrier and usually, when knowledge is gained, other barriers appear. For example, farmers in some areas may not be aware of the benefits of flood management systems (although they are in the pilot districts) but once they are aware they will have to overcome other barriers, such as lack of technical knowledge and the labour and financial cost of constructing flood controls.
- 2.9 Lack of capital, access to credit and infrastructure are widespread and serious barriers. Scepticism is also noted as a barrier in the baseline survey, indicating that there will need to be some active promotion of information to change farmer’s beliefs (this was not the case in the pilot counties visited where farmers and extension workers believed that the weather and climate was changing; if there is scepticism it is more likely to be at the top decision-making levels).
- 2.10 Barriers can also be identified from previous attempts to introduce conservation agriculture in Bong County. The Care International/Oxfam project that started in 2009 aimed to have 4,000 farmers adopting CA practices and managed to deliver half this number. The most significant barrier was the extension service. Capacity to support farmers in conservation agriculture was found to be extremely low; insufficient staff, lack of transport to visit sites, lack of knowledge. The support provided by the project was targeted at those directly engaged with farmers and therefore tended to miss out the district and County administrative staff (e.g. at the level of the County Agricultural Coordinators and District Agricultural Officers employed by the MoA.) This indeed is a typical shortcoming with projects – they develop capacity in the central Ministry and at field level, but largely by-pass the county administration level.

Table 4: Barriers to adoption of conservation agriculture

<i>Individual</i>	<i>Institutional</i>	<i>System</i>
<p>Farming is practiced as a subsistence activity rather than as a business. It is not the main livelihood activity for most farmers. Investment of resources and labour is therefore limited.</p> <p>Lack of ownership or secure tenure of land means farmers prefer to shift and avoid investment.</p>	<p>MoA extension service is under-staffed, under-resourced and lacking in relevant knowledge, so advisers/facilitators need to be brought in by the project</p> <p>MoA and NGO do not coordinate agri project sufficiently, so projects backed by international donors were sometimes supporting farmers to do the direct opposite of conservation agriculture in the sites</p>	<p>Tensions and overlap exists between the extension services provided by MoA and Ministry of Internal Affairs communal farming service.</p> <p>Competition for lowland is becoming intense as population expands and other land-uses develop.</p> <p>The capacity that was developed was not ‘mainstreamed’ and so when the project ended, the advisers stopped working with farmers</p>

Source: Interview with Care International and end of project evaluation report

- 2.11 There is therefore a substantial gap between farmers and the extension service, both physically (extension workers visit very few farmers) and in understanding. For example, the evaluation of the CA pilots asked county-level stakeholders what they thought the most beneficial CA interventions were. They prioritised the new rice strains and mechanical

cassava grinder. They thought that the core CA techniques of minimum tillage, permanent soil cover and no burning were of little benefit. Farmers on the other hand said the opposite - that the CA techniques were the most beneficial in terms of raising productivity⁴. Clearly, there is a need to involve extension workers in the monitoring, training and lesson-learning that comes from the pilot sites.

2.12 The overall conclusion on capacity development from the evaluation of this project was that MoA, MIA or other Liberian stakeholders did not have the necessary “*organizational capacity and resources*”. The continuation of CA in the pilot sites and any roll-out to other areas therefore depended upon further financial and technical assistance from international donors.

Case studies

2.13 Conservation agriculture provides one case study that illustrated barriers that are relevant to climate change adaptation. Several others were examined during the needs assessment:

- Conservation agreements with farmers in Nimba county
- Road reconstruction and climate change
- Lessons from the caterpillar outbreak in Liberia.

Table 5: Barriers to adaptation identified from case studies

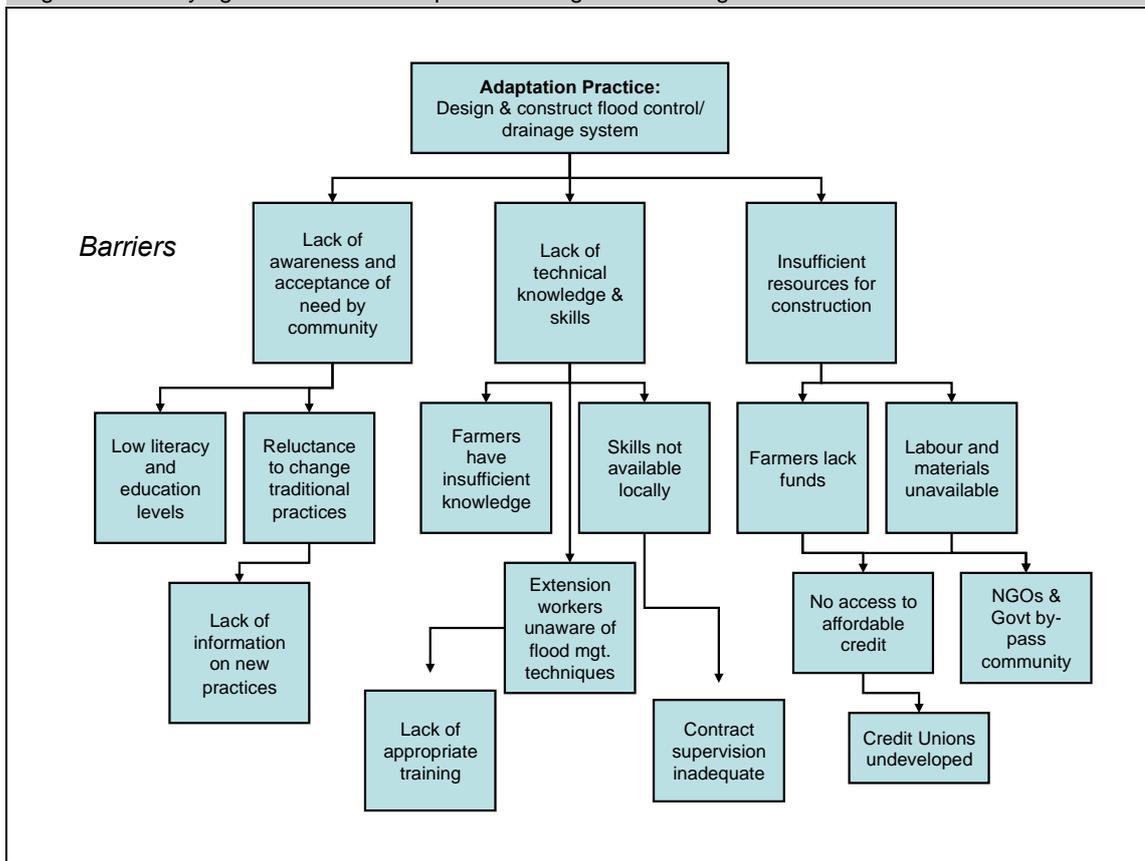
Case study	Individual barriers	Institutional barriers	System barriers
Conservation agreement	High levels of poverty and unemployment Different cultures/tribes do not always cooperate	FDA doesn't have the capacity to enforce or guide sustainable forest management practices where communities activities are concentrated	Slow and complex bureaucracy means that the making and enforcing of agreements is difficult Land ownership is poorly defined and uncertain.
Caterpillar outbreak	Individual staff in MoA lack the skills and knowledge to manage pest outbreaks and so rely heavily on external support	MOA does not have sufficient external expertise to manage pest & disease outbreaks MoA does not have contingency plans and a rapid response-capability	The emergency planning procedures across government are weak and events tend to be dealt with on an ad-hoc basis
Roads	Ministers are under pressure to produce quick results so may cut corners on standards and procedures	EPA does not have the capacity to ensure that proper EIAs are conducted for roads projects	Government does not always follow its own planning and implementation procedures

⁴ Care Liberia (2012) End of project evaluation: Revitalizing communities through conservation agriculture in Bong County, Liberia.

County and national consultations

2.14 We also visited the pilot counties of Bong and Grand Gedeh to discuss barriers to adaptation with stakeholders in depth. The consultations and case studies confirm that the barriers are specific to each issue (see example in Figure 1) The implication of this is that capacity development needs for supporting adaptation need to be identified on a case-by case basis. Some barriers can be removed at the local level, but some will need additional support from county and national levels.

Figure 1: Identifying the barriers to adaptations using water management



Source: Problem tree analysis based on site-level consultations

Barriers at county level

2.15 There are a number of prevailing barriers at county level, particularly to do with weaknesses in the extension service:

- Insufficient Resources: funds, equipment and materials;
- Inadequate Expertise: Technical specialist on topics such as pest & disease control and irrigation. These specialist tend to be international, and so one obvious objective is to increase the amount of national expertise held in Liberia’s Universities, research institutions and government ministries.
- Insufficient staff and logistics: The limited number of extension staff and their limited ability to move around the country means that only a minority of farmers are reached.

- 2.16 The 2011 annual report from the MoA says that a total of 15,951 farmers (37% of whom were women) were visited throughout the country⁵. Although the total number of farmers is not known it is clear that only a very small fraction are being reached. The number of extension workers is officially 85⁶, although around 60 are said to be ‘active’⁷. There are County Agricultural Coordinators (CAC) for each county, but there is less than half the number of District Agricultural Advisors (DAO) required to cover all districts in Liberia. Over seventy five percent of the villages in the producing areas are not accessible by vehicles and many other areas become inaccessible during the rainy season⁸. High illiteracy rates, especially among women, means that conventional communication channels don’t work.
- 2.17 The average age of extension staff is high and their knowledge and skills are said to be outdated. Even if they were able to reach a significant number of farmers, their ability to guide farmers on conventional agriculture, never mind new topics such as climate change adaptation, is very limited. The extension service at county and national level is stuck in an old-fashioned and ‘top down’ mind-set that is not suited to the farmer-led, demand driven approach that is typified by the Farmer Field Schools. As the scoping mission for the CCAAP project noted, much work needs to be done to institutionalize this new approach in Liberia. The suggestion in the CCAAP programming document is that the extension service should be radically overhauled, with the adoption of participatory processes and a change in the duty and attitude of MoA extension workers so that they become a resource for farmers, rather than being instructors. Such an approach would require close cooperation with field level organisations such as farming associations and NGOs in order to reach a significant proportion of farmers.
- 2.18 Because of these limitations in the extension service agricultural development projects have typically added their own farm-level outreach workers. Thus component 2 of the CCAAP projects will employ an additional six extension workers in each of the two counties: two new MoA extension workers to work with the existing District Agricultural Officer and four Farmer Field School Facilitators, recruited from Care International and AEDE local staff.
- 2.19 Although complete reform of the extension service may be necessary, it is beyond the scope of the CCAAP project. Much larger projects have sought to transform the extension service without much visible effect. The CCAAP project can however, through component 2, pilot a different kind of extension service in the Bong and Grand Gedeh sites and with the 12 new extension workers. The need in component 1 is therefore to help county and national managers to develop their capacity to manage and support this new type of extension service, and to remove the barriers to adaptation encountered at farm-level.

⁵ MoA (2011) Annual Report 2011

⁶ MoA HR Department, February 2013

⁷ Interviews with MoA national and county officials

⁸ MoA (2008) Liberia Food and Agriculture Policy Strategy

3: National level capacity needs

- 3.1 The previous section looked at the capacity development needs from the perspective of farmers, organisations working with farmers, and county-level administrators. This section looks at capacity development needs as seen by national decision makers. Once again, we begin by identifying the activities that will need to be taken at a national level to manage climate change, before we consider the type of capacity that is required to carry out those activities. This section also considers the level of capacity that already exists.
- 3.2 As the previous section shows, the adaptation activities that can be adopted in smallholder farming situations in the pilot districts are reasonably well known. Much less is known about the adaptations threats and opportunities in other agricultural activities – livestock rearing, concession agriculture and fisheries, for example. Yet these are vital agricultural practices in terms of economic contribution, employment and land use. This section therefore takes a wider look at the existing management of climate change in other farming sub-sectors. The overall conclusion is that there is little or no understanding of adaptation measures and hence of capacity building needs in these sub-sectors.

General requirements of policy managers

- 3.3 Those responsible for managing climate change adaptation will have to perform a number of roles that are typical in the process of managing policy issues such as climate change. For this they need:
- A policy to create the context and statutory duty for their work
 - Policy levers; to influence the behaviour of actors in the ways required to achieve the policy (typical examples are rural credit, pricing policies, subsidies, property rights, extension services and safety net programs)
 - Support from Ministers
 - Ability to demonstrate results to Ministers by showing actual achievements on the ground
 - Ongoing funding for management and operations (including the ability to secure funding from international donors for climate change initiatives).
 - Ability to influence other Government Departments
 - Effective extension, outreach or devolved decision making systems
 - An effective delivery plan and performance management system, that directs staff and other resources towards achieving objectives and ensures that targets are met.
 - Knowledge and skills (on both the subject of CC and on management)
 - Links to external sources of expertise (national and international)

- 3.4 Funding for climate change is most likely to come from international donors for the foreseeable future and therefore the ability of policy managers to identify and make successful applications to climate change funds is an important aspect of their role and capacity development.

Requirements specific to the management of climate change

Policy development needs

- 3.5 The CCAAP project initiation document emphasises the importance of taking action at the policy-making level. It notes that climate change is not integrated into sectoral policies and, as a consequence some existing policies and investments may be increasing vulnerability to climate hazards. The large-scale drive towards lowland rice production is cited as the main example. Another example is the failure to address the increasing vulnerability of the upland agricultural system (shifting slash & burn farming) to environmental degradation, population growth and competition for lands use. A third example is the large-scale concession agriculture model, which will result in rubber and oil palm monocrops.
- 3.6 Liberia has a climate change and agriculture policy, contained within chapter nine of the Food and Agriculture Policy and Strategy⁹. The policy is:

Mechanisms in place with contributions from the agriculture sector, monitoring climate changesituation in respect to Liberia, ensuring agricultural activities in Liberia do not contribute to suchchanges, and that such changes will not seriously undermine efforts directed at poverty alleviation,food security, and environmental protection

- 3.7 The strategy for managing climate change adopted in this 2008document is:
- Supporting and promoting sustainable agricultural production like conservation agriculture,and rural development activities which reduce vulnerability of cropping systems;
 - Providing information and advice through statistical data and information, and mass media,about climate changes, causes and risks, and available adaptation strategies especially inrelation to the agriculture sector;
 - Promoting proven best practices, policies and measures that encourage forest protection, sustainable farming, and sustainable energy utilization;
 - Supporting the institutionalization of adaptation capacities through partnerships with NGOs,civil societies, private sector and concerned government organizations; and
 - Supporting climate change related research, education and training.
- 3.8 Measuresare also proposed elsewhere in the policy that are relevant to the management of climate change:
- Establishing an Environment Unit in MOA to collaborate with the Environmental ProtectionAgency (EPA) and supporting the establishment of similar units in other agriculturally relatedinstitutions;
 - Supporting the development of environmental legislations and guidelines for agriculturalpractices and establishing appropriate measures for country-wide sensitization, awareness,and enforcement of the policy instruments;

⁹MoA (2008) Food and Agriculture Policy and Strategy: "From subsistence to sufficiency".

- Creating awareness, implementing plans, and enforcing national legislations forenvironmental protection and conservation from agricultural practices;
- Supporting and promoting actions for establishment of forests for protection of watershedsand wetlands; combating desertification; conserving biological diversity and contributing tothe stabilization of global climate;
- Supporting measures to subject all sector policies and plans to Strategic Environmental Assessments (SEAs) and projects to Environmental Impact Assessments (EIAs);
- Implementing programs to conserve soil and water resources and for conservation farming;andsupporting sustainable management programs for regional and trans-boundary resources.

Agricultural adaptation measures in the National Adaptation Program of Action

3.9 The National Adaptation Program of Action (NAPA) identifies agriculture as the most important sector for climate change vulnerability, but does not add useful detail on measures and deals only with cropping and fisheries (see table 6 for a summary of the NAPA recommendations for agriculture.)

Table 6: Agricultural adaptations suggested in the NAPA

Farming type	Key adaptation measures
Cropping	<ul style="list-style-type: none"> • Adjusting the timing of crop cultivation in response to changing patterns of rainfall; • Intercropping, irrigation, and the optimization of lowland/swamp farming practices; • Pest control including fencing, bird scare, weeding • Maintaining fast growing nitrogen fixing tree species to improve soil fertility and using multiple-purpose tree species on farmlands to maintain forest cover.
Livestock	(Not addressed in NAPA)
Concession agriculture (Rubber, Oil Palm etc.)	(Not addressed in NAPA)
Fisheries	<ul style="list-style-type: none"> • Regulating fishing licensing and practices to prevent overexploitation and fishing in restricted areas; • Surveillance of Liberian fishing waters; • Funding research aimed at fishery related database development; and • Formulating a national fishing policy

Source: National Adaptation Program of Action, 2008

3.10 Although Liberia already has elements of a policy for the management of climate change in agriculture, there is a need to develop this into a stand-alone policy statement for managing climate change in agriculture. This is necessary because the existing policy is largely unknown, buried within the broader Food and Agriculture Policy Strategy (FAPS). The actual policy making needs are relatively simple; a short statement from the government on the importance of climate change for agriculture, and its objectives for managing adaptation are all that is required at this stage to give a framework within which Ministers and technical managers can work.

Capacity to implement policies

3.11 In general, the capacity of Government Ministries to implement policies is extremely limited and as a consequence policies tend to get written and left on the shelf. There is therefore a

need to develop policy deliver capacity. In practical terms, this means the capacity to put together a plan for how policy objectives will be achieved, to organise the necessary resources and to ensure that staff and indeed Ministers are accountable for results. Table 7 indicates the type of activities and capacity needs associated with policy delivery.

Table 7: Activities and capacity needs associated with policy delivery		
Activity	Needs (skills)	Needs (Resources)
Design and planning of policy development exercise	Policy management skills	Mentoring (possibly)
Policy development consultations with core group	Consultation/facilitation skills	Budget for consultation process, including counties
Drafting of policy statement	Drafting skills Reasonable subject knowledge	
Wide consultation on draft policy	Consultation and consensus building skills	Budget for consultation process
Production & dissemination of final policy statement		Printing & distribution costs

Coordination of policies and programs: Cross-sectoral planning and implementation

- 3.12 Climate change is a cross-cutting issue. The Ministry of Agriculture therefore needs to coordinate with other Ministries to plan and implement adaptation measures for agriculture. It needs to ensure that the policies and programs of other sectors support the objective of climate resilience in the agriculture sector and do not increase vulnerability or lead to ‘mal-adaptation’. It also needs to be able to manage agricultural emergencies caused by climate change and extreme weather, coordinating with other Ministries such as Internal Affairs, Planning and Health. And it needs to interact with the national meteorological system, which is under development. Mechanisms for cross-sectoral coordination in Liberia are at an early stage of development and so the CCAAP project should aim to help strengthen these, as well as integrating with them.

‘Climate smart’ policies and programs

- 3.13 There is a need to review the MoA’s own policies, and those of other government ministries, to assess the extent to which they are resilient to climate change. Liberia’s policies for rice production, concessions agriculture, livestock, fisheries and other sub-sectors are summarised in Annexe B. In general, the current policies favour intensification, commercialization and privatisation of crops and livestock, in order to increase productivity, food security and rural employment. These policies have not been subject to an assessment of whether they are ‘climate smart’ or not. There is therefore a need to carry out a policy review to identify those which are positive and which are negative for climate resilience.
- 3.14 Strategic Environmental Assessments (SEA) are the government’s mechanism for ensuring that environmental issues, including climate change, are taken into account during the making of policies for agriculture and other sectors. There is no information on whether this instrument is currently used. At the project level, Environmental Impact Assessments (EIA) is the Government’s mechanism for ensuring environmental issues are considered including,

potentially, climate change. Currently, “*Environmental impact assessments are not yet incorporated in agricultural projects because of weak institutional capacity to monitor the activity*”¹⁰ so there is a need to support the development of SEA and EIAs across government. For this the MoA will have to work with the Environmental Protection Agency (EPA).

Integrating with the climate change framework

- 3.15 There is a National Climate Change Steering Committee located in the Office of the President and chaired by the Ministry of Planning, but this is inactive. In effect, coordination and leadership is currently provided at the secretariat level, by the Environmental Protection Agency. EPA’s capacity to play this role is limited however, with only one member of staff acting as the national climate change focal point. The REDD Technical working group is also active and will receive substantial support over the next few years through the REDD Preparation Plan (R-PP) funded by The World Bank and led by the Forestry Development Authority. If a second strand of work is introduced through the CCAAP – on agriculture adaptation, then this will bring additional impetus and resources to the national framework.
- 3.16 In general, various government agencies and some nongovernmental organization are engaging in climate change activities separately. Effective coordination among government, international agencies and NGOs remains the number one challenge¹¹. For the purpose of this report, the key point to emerge from this is that staff within MoA will need to have the capacity to engage with these different parts of government and different initiatives in a knowledgeable and coordinated way.

Integrating with the national disaster risk management framework

- 3.17 The UN Food and Agricultural Organisation (FAO) concluded that climate change/variation is the primary disaster risk management challenge for the agriculture sector in Liberia¹². There is a national framework for Disaster Risk Management (DRM), involving a National Disaster Risk Management Committee. Mechanisms for managing, planning and coordinating disasters are said to be largely “non-existent” at country level¹³. The MoA has had to deal with a number of pest and disease outbreaks that have been associated with climate change. So far it has done this on an ad hoc basis but there is a need to develop the MoA’s capacity in this respect, by establishing a group of staff with the necessary skills and knowledge, by developing contingency plans and by strengthening the MoA’s contribution to the national Disaster Risk Management framework.

Integrating with the national meteorological system

- 3.18 A third area which the MoA needs to link into is the national meteorological and ‘early warning’ weather forecasting system. This system is just starting to be built, through a GEF funded regional project entitled ‘*Strengthening climate information and early warning systems in Western and Central Africa for climate resilient development and adaptation to*

¹⁰ MoA (2008) Liberia Food and Agriculture Policy Strategy

¹¹ CCAAP Programming document

¹² FAO’s DRR strategy launching workshop, Monrovia, 7 December 2011

¹³ National Disaster Management Commission (2009) Capacity needs assessment report. Disaster Risk Reduction. Ministry of Internal Affairs and UNDP.

climate change'. This will fund the installation of meteorological and hydrological equipment in Liberia, the training and equipping of officers to run the system (3-5) and training of staff for forecasting (4). It also provides support for the use of climate and weather forecasts into national planning and national disaster management procedures¹⁴. It is a three-year project that began in 2012 under the leadership of the Ministry of Transport.

- 3.19 The Ministry of Transport is also leading the implementation of another regional project that aims to improve farmer's ability to manage weather and climate-related risks, by training and by linking them with national meteorological and hydrological agencies. The three-year METAGRI project is supported by the World Meteorological Organization (WMO) and international donor funds from Spain, Greece and Norway. A series of seminars will be held to train Liberian farmers, rain gauges will be distributed and general awareness will be raised through media and internet¹⁵.
- 3.20 The Ministry of Lands Mines & Energy has also benefitted from a \$4 million project to re-install a network of rain and river gauges, funded by NORAD. Thus a number of Government institutions have an interest in establishing a hydro-meteorological system, including the Hydrological Service within the Department of Land, Mines and Energy, and the separate Liberian Meteorological Service which was destroyed by the wars (Aviation, transport and other data users currently rely on weather data from neighbouring countries). Donor-funded efforts to re-establish a system of weather and climate data collection are therefore scattered amongst various Liberian government bodies.
- 3.21 The CCAAP project therefore needs to develop the capacity of a team of MoA staff so that they can gather meteorological information from these various sources, interpret it and translate it into useful messages to communicate to extension workers and farmers. They also need to be able to link this information into an 'early warning' system for forecasting climate/weather hazards and ensuring that contingency plans are in place for managing impacts on the agricultural sector and on food security.

What capacity already exists to meet these needs?

Capacity assessments of the agriculture sector

- 3.22 A number of capacity assessments have been conducted for the agricultural sector in Liberia, in recent years. A national capacity self-assessment, supported by GEF, looked specifically at capacity to manage climate change across the Government of Liberia. This identifies constraints in all areas (see box):

¹⁴ GEF Project Identification Form. Strengthening climate monitoring and early warning systems. May 3 2012

¹⁵ WMO (January 2012) METAGRI Operational Project

Figure 2: Climate change capacity constraints identified in 2010 GEF Assessment**Capacity constraints at Individual Level**

- Inadequate trained human resources to effectively manage the climate change sector;
- lack of awareness on mitigation and adaptation options, as well as other relevant issues on climate change;
- absence of training opportunities in the core disciplines of climate change;
- lack of research programs on climate change issues;
- lack of education and training programmes on climate change;
- lack of specialized skills or expertise in scientific and technical institutions concerned with climate change issues

Capacity Constraints at Institutional Level

- The lack of a comprehensive climate change action plan and integrated implementation strategy that takes into account the capacity building needs of the various institutions participating in climate change activities, particularly in research and training;
- lack of efficient climate change monitoring;
- need to rehabilitate climate change institutions with needed scientific technology to implement UNFCCC in Liberia.

Capacity Constraints at the System Level

- lack of explicit policy and regulatory measures that adequately take into account climate change issues as sustainable development priorities;
- inadequate national programmes aimed at reducing pressure on resources and enhance adaptive capacity;
- lack of adequate public awareness and education mechanism to provide opportunities for meaningful public participation;
- lack of financial resources to provide critical equipment required to facilitate data collection.
- lack of skilled human resources as well as the necessary infrastructure for effective climate change management.

Source: GEF National capacity self-assessment

- 3.23 Capacity was also reviewed during the preparation of the Liberian Agricultural Sector Investment Plan (LASIP). This found that *'public support for the agriculture sector has long been recognized as ineffective ... Low institutional capacities have in turn made it difficult for these organizations to perform core responsibilities of policy development, regulation and the provision of essential services.*
- 3.24 These existing capacity assessments make the point that there are serious needs throughout MoA and its partners. They confirm the need for greater policy making and implementation capacity. The problem with these sweeping assessments is that they imply that capacity across the board is seriously lacking. But it is also true that these needs cannot all be met immediately and so to some extent we need to work with what we have. The MoA manages to function and for evidence of this we need only consider that the same international donors who sponsor these assessments also entrust the MoA with the delivery of multi-million dollar projects. For the development of a capacity development plan for the CCAAP project there is therefore a need to re-examine in detail the capacity available amongst technical staff and MoA and partner organisations, concentrating on what capacity there is to build on, rather than what is lacking.

- 3.25 During this needs assessment exercise it has proven very difficult to get basic information about the number of staff in MoA divisions and their knowledge and skill levels. This will therefore become an activity within the capacity development plan, with a focus on building on what is there and leveraging in support from other projects by building a climate adaptation dimension into their capacity building activities.

4: Capacity needs in education and training institutions

- 4.1 One of the objectives of the CCAAP project is to improve research, education and training on climate change adaptation by developing the capacity of Liberian tertiary education and research institutions. For this, the MoA has chosen to partner with The University of Liberia and Cuttington University.
- 4.2 Through consultations and a joint planning workshop in January 2013, a plan for capacity development has been developed. The main activities agreed are to:
- incorporate climate change adaptation in agriculture into the curriculum for tertiary education in the two universities;
 - support a series of research projects on topics agreed with the CCAAP technical working group¹⁶;
 - support field-level research into adaptation practices and the effectiveness of these.
- 4.3 To implement this plan the universities will conduct a curriculum review and will put forward a plan for research. A budget of \$30,180 and \$45,000 has been allocated from the CAP project for the research and curriculum development.
- 4.4 At present, neither university has courses for students or research projects on climate change and therefore development of these is required. From consultations with senior staff however it is clear that there is a good level of knowledge of climate change and agricultural adaptation issues amongst teaching staff and researchers. The capacity need is therefore to develop climate adaptation teaching modules that can be inserted into agriculture courses. The project does not need to develop the general teaching/research capabilities of the universities.
- 4.5 There are other important research and educational institutions in Liberia, such as the MoAs' own Central Agricultural Research Institute (CARI) and the growing number of agricultural colleges that are being built in many counties using county development funds. CARI is receiving substantial capacity building support from other programs and so it is sensible for the CCAAP project to concentrate on the universities. However, the aim of the project should be to develop climate change adaptation education components in the universities that can be rolled out widely; to other education and training institutions and also to schools. The capacity development needs therefore include strengthening the ability of MoA managers and University staff to promote and disseminate the education and research. This can be taken forward through the knowledge management component of the CCAAP project.
- 4.6 There is a rapidly growing body of international knowledge on climate change adaptation and Liberia has not been able to benefit from this fully. This is largely because of the small

¹⁶Five topics were identified, subject to further validation: Water & soil management; knowledge management networks; economic and social impacts of adaptations; impacts of CC on biological systems and management of meteorological data.

number of individuals who are connected into international research and policy networks, but it is also because there has been very little opportunity to apply this knowledge. The CCAAP project is the first in Liberia specifically on agriculture adaptation and there are other more pressing issues such as security and food security dominate the policy agenda. A capacity need is therefore to enable a number of key staff within MoA to become involved with international research and policy development.

5: Gaps and opportunities

- 5.1 Having identified capacity development needs at county and national level in the previous sections above, this part looks at the extent to which these needs are being met, or could be met, through other initiatives. Although the CCAAP project is the only one in the agricultural sector specifically addressing climate change, other projects are supporting capacity building and agricultural activities that are relevant to adaptation. Documentation for relevant other projects was reviewed and a capacity coordination workshop held with Project Coordinators within the Project Management Unit at MoA. The PMU is a central point for the management and coordination of large, donor-funded projects.
- 5.2 This section also identifies fisheries as a major gap in the analysis and planning that has been so far been done on agricultural sub-sectors.

Relevant capacity building projects

- 5.3 Several large projects being implemented by the MoA have a capacity building element. The Agricultural Sector Rehabilitation Project (ASRP) runs from 2010-2014 with a total budget of over \$24 million. This has funded 20 technical staff to do post-graduate studies abroad. It has also trained 164 Community Agriculture Facilitators, who will in turn train farmer's leaders, and it has trained 167 Adult Literacy Facilitators. 24 national professionals have been recruited by the project to strengthen national capacity and to strengthen the extension service, 'MoA focal points' have been recruited, one for each of 4 counties. As well as supporting individuals, the project has substantial funds to carry out agriculture infrastructure improvements that will be relevant to adaptation. For example, one of the adaptation measures recommended for component 2 of CCAAP is water management. In Grand Gedeh, this requires the reconstruction and construction of dams. Hence the CCAAP project should be seeking to lever in funds for ASRP for pilot site activities. It should also be seeking to inject a climate change component into the training received by technical managers and others involved in the ASRP project.
- 5.4 The West African Agriculture Project (WAAP) is funding 37 agriculture students abroad for postgraduate qualifications. It is also training farmers, the extension service and local NGOs in best practice, including international experience. As with ASRP, this has no specific climate change content so the CCAAP projects needs to work alongside the WAAP to add this dimension and to benefit from the training provided that is relevant to adaptation. There are a further three large projects within the MoA alone that have capacity building activities relevant to CCAAP. This includes the Food and Nutrition Service, which is looking for support to add an early warning system capability to enhance its disaster risk management work. The Smallholder Agricultural Productivity Enhancement and Commercialisation project (SAPEC) includes a major capacity building component which will support CARI and training in planning, M&E and implementation for MoA technical staff.
- 5.5 Outside of the MoA there are other substantial projects, such as the Food & Enterprise Project FED sponsored by USAID (Total budget of \$7.9million, 2011-2016). This has a capacity

building component that will train farmers in Bong County in improved practices, including conservation agriculture, using a farmer field school-type approach. It will also provide support to vocational agricultural colleges to improve their education of agricultural students. A GEF funded project titled *Mainstreaming and Capacity Building for Sustainable Land Management* aimed to ‘mainstream’ and develop capacity for sustainable agriculture. This was implemented by the EPA and the University of Liberia with approximately a \$1 million budget (ended 2010) and now funding is being sought for implementation. Support to Cuttington University is being provided through Oxfam and IFPRI, and the UNDP ‘Boots on the Ground’ program, all of which relates specifically to building national climate change capacity¹⁷.

- 5.6 It is clear that tertiary and research institutions are already receiving substantial capacity building support to do similar activities to that which will be required for the CCAAP project; curriculum review and development for example. There is therefore a need to avoid duplication and to link closely with projects such as FED on the development of curricula for Farmer’s Field Schools and for educational institutions.
- 5.7 Several more projects with relevant capacity activities were identified during the needs assessment. Their relevance to the capacity building aims of the CCAAP projects are summarised in Table 8.

Table 8: Capacity support provided by other projects currently operating in Liberia

	Training for MoA technical staff	Training for extension service staff	Development of Education and Research Institutions	Training for farmers	Awareness raising & knowledge management
ASRP Agricultural Sector Rehabilitation Program	☐	☐	☐	☐	☐
WAAP West Africa Agriculture Productivity project	☐	☐		☐	☐
STCRP Small holder Tree Crop Revitalisation Project		☐		☐	
SAPEC Smallholder Agricultural Productivity Enhancement & Commercialization	☐	☐	☐	☐	☐
FED Food and Enterprise Development		☐	☐	☐	
EHELD Excellence in Higher Education for Liberian Development			☐		
SHOPS Small holder Oil Palm Support				☐	
REDD+ R-PP Reducing Emissions from Deforestation and Degredation – Readiness Preparation Plan	☐		☐		☐

Source: Project documentation and consultation

- 5.8 The key point for this needs assessment is that capacity development support is already being provided to all of the key activities of MoA; its extension service, research institutions and key partners. The funds available through these other projects greatly exceed the budget of component 1 of the CCAAP project. The CCAAP project does not therefore need to give ‘mainstream’ capacity support but should instead complement these other projects by adding support that is very tightly focussed on improving the management of climate change. As well

¹⁷CCAAP Programming document

as expertise on climate change and adaptation, the CCAAP project should help the managers of the CCAAP project and the staff within the MoA and elsewhere to become adept at working with these other projects. They therefore need to have a broad understanding of the sector, be capable of engaging with other projects and skilled at influencing and coordinating the work of others. Ministers have an important role to play in this respect, because they are responsible for overall coordination and strategic direction.

Gaps in the understanding of adaptation in agriculture sub-sectors

- 5.9 Senior staff in MoA have some awareness of the importance of climate change to the various agricultural sub-sectors (crops, livestock, fisheries etc.), but there has been no detailed analysis of climate change impacts and hence adaptation requirements. There is therefore a need for each of the relevant divisions in MoA to conduct its own review of risks, identify adaptation requirements and plan for how it will support these.
- 5.10 The sub-sector of fisheries has been largely neglected in recent discussions of climate change in agriculture. It is identified as an area in which adaptation is required in the 2008 NAPA (see table 6 in section 3), but is subsequently overlooked in the CCAAP programming document and other climate change initiatives. One exception is the study of investment and financial flows for adaptation conducted by GoL and UNDP¹⁸. This identifies fisheries as the second most important agricultural sub sector in terms of requiring adaptation funding. There is an almost complete lack of analysis of what the climate change threats to Liberian fisheries is and what adaptation responses may be taken. This is gap that should be filled because fish are a vital food source for a large proportion of the Liberian population and a large number of people are involved in coastal or inland fishing, mostly on a subsistence basis. Issues identified from consultations in this study were:
- Along the coastal belt of Liberia, fishing communities have experienced changes in their landscape and habitat as a result of erosions' effects. They are forced to move from one area to another to continue their livelihood;
 - Weather change affects their normal fishing patterns and methods, whereas previously they believed that the moon and sun influenced fish stock movements; and
 - fishing livelihoods are expected to be disrupted as production reduces, nutrition requirements are not met and income for fishing communities falls¹⁹.
- 5.11 The CCAAP project therefore needs to develop capacity in the Fisheries Bureau (an agency of the MoA) to improve the national understanding of climate change impacts on fisheries and adaptation options. This will involve the capacity for program development and fundraising, to create a program for addressing climate change in Fisheries.

¹⁸GoL & UNDP (2011) Assessment of Investment and Financial Flows to Mitigate Climate Change in the Energy and Forestry Sectors and for Adaptation in the Agriculture Sector.

¹⁹Correspondence with FAO fisheries expert in Liberia

6: Conclusions: Priority capacity needs

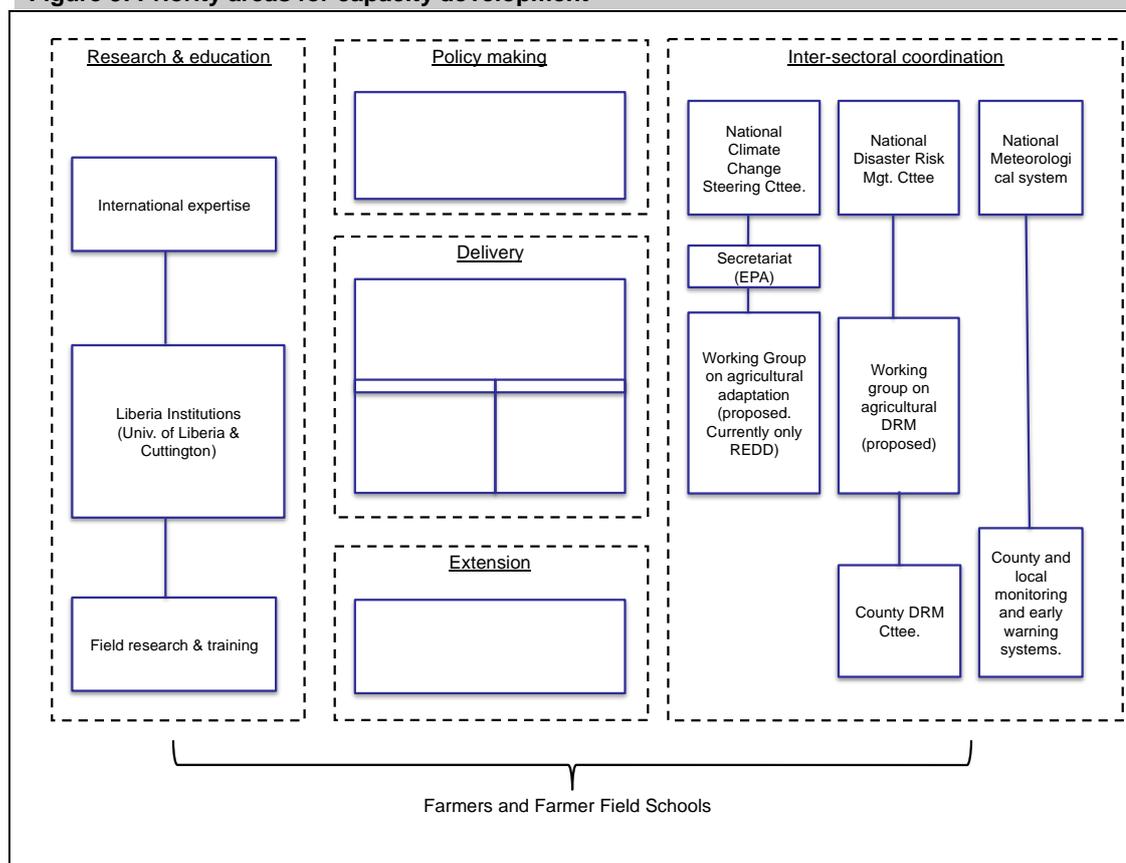
6.1 This section concludes the needs assessment by identifying priorities for capacity development. The conclusions in this section inform the subsequent capacity development plan.

Institutional and system priorities

6.2 At an institutional and system level, five main priority areas are identified through the preceding analysis. These are:

- Policy making
- Policy delivery (effective implementation)
- Extension service
- Inter-sectoral coordination
- Research and education

Figure 3: Priority areas for capacity development



Source: D Rothe

Policy making

- 6.3 The Ministry of Agriculture needs to lead as well as support farmers to adapt. To do this it needs a policy framework within which to work. There is already a policy for climate change in agriculture so a long, expensive legislative process is not required. But the current policy is buried within the overall national food and agriculture policy and is not well known. It also needs updating to reflect Liberia's growing engagement in climate change issues and understanding of the impacts on agriculture. All that is required is a policy statement. This will enable everyone to understand what the governments' objectives and strategy for agricultural resilience. It should be a Government document, not just a MoA statement, because it is essential that other government ministries and agencies contribute to strengthen resilience and avoid adding to climate-related hazards through their policies and programs.
- 6.4 The Ministry of Gender's '*Climate Change and Gender*' policy statement is a good example. This sets out the government's objectives and a plan of action. It has been successful in raising the profile of climate change amongst the Ministry and in Government as a whole. The President has referred to the initiative in keynote speeches, which encourages action and important for attracting funding from international donors. Funding applications can refer to a clear policy framework and Government commitment. Agriculture is currently lacking this, despite it being the most important sector in terms of climate change impacts.
- 6.5 A policy-development exercise can be used as the basis for training and awareness raising across all relevant staff at MoA and in key partner organisations. This training should have a general component on agriculture adaptation issues and policy in Liberia and a specific component that is tailored to the duties of those being trained.

Policy delivery

- 6.6 A policy is of no use unless there is a commitment and an effective plan to implement it. This requires a delivery plan that specifies actions and targets, and a performance management system that makes staff and responsible for the achievement of targets. The resources that these staff require to do the work must also be secured.
- 6.7 To manage delivery, a dedicated team of technical staff is required, hence the proposal to form a unit within the MoA (The team is described in Figure 3 as an '*Agricultural Resilience Unit*' but will be defined further in the Capacity Development Plan exercise that follows this needs assessment). The CCAAP project team provides a starting point and further funding can be sought to strengthen this team so that it can be 'mainstreamed' into MoA before the project ends. By providing capacity support to technical staff in the Ministry the CCAAP project will develop the climate resilience skills and knowledge that is needed for the Unit's tasks of policy development, delivery, coordination and supporting extension by removing barriers to adaptation.
- 6.8 The team will be responsible for drafting the resilience policy as well as managing implementation, on behalf of the responsible Minister. It will manage the support and promotion of long-term adaptation in the agricultural sector, as well as emergency response to climate/weather-related disasters and contingency planning. It will also support the extension

service by removing barriers to adaptation that cannot be removed at county level (e.g. securing funding for major water management projects).

Extension Service

- 6.9 Numerous strategies and programs have addressed the need to strengthen the extension service yet it remains under-resourced and of limited effectiveness. The CCAAP project should not be used to contribute to the ‘mainstream’ capacity development of the service. Instead it should focus on disseminating the practical adaptation measures developed in the pilot counties and on enabling extension workers to have access to weather information generated through the national meteorological system. All extension workers and those managing the service should take part in training based on the policy statement agricultural resilience as well as in the practical lessons emerging from the Farmer Field Schools.
- 6.10 To disseminate local information on adaptation practices and national information on weather and climate change, improvements to the resources available to extension workers are required. County and District staff commonly have no information on these topics, and have to rely on what they can find themselves on the internet. A need identified at the local level was therefore for a resource centre, based in the county agriculture offices, where extension workers can go to get the latest information and to do their own research.

Inter-sectoral coordination

- 6.11 Climate change is a crosscutting issue and the main barriers to adaptation and resilience are big issues that require cooperation with other Ministries and with the non-governmental sector, such as land ownership and land use planning. A priority is therefore to strengthen the capacity of the MoA to coordinate its own activities related to adaptation, and then to influence the policies and programmes of other parts of government. There are already a large number of programs providing capacity development to the agricultural sector and so a first step is to build a climate change adaptation element into these. This is not an easy task; coordination is always difficult and especially so in a context such as Liberia where many donors and agencies are pursuing their own interests and management is relatively weak. It requires very strong leadership from Ministers and hence they are also a priority for support under the CCAAP program.
- 6.12 Three areas are identified as particular priorities for coordination and associated capacity development. These are the national climate change framework, the disaster risk management framework and the national meteorological system. The capacity support required is to manage the use of these frameworks to support agricultural adaptation, but also to contribute to their strengthening because they are all developing systems.
- 6.13 There is a need for mechanisms for checking that policies and projects for agriculture and other sectors contribute to agricultural resilience and do not add to hazards. This can be done, on a pilot basis, with Environmental Impact Assessment and Strategic Environmental Assessments as tools for ensuring that projects and policies are designed so that they improve. To do this, the MoA and the EPA need support to improve their capacity to add a climate change component to EIA/SEAs and, more importantly, to implement these tools more effectively.

Research and education

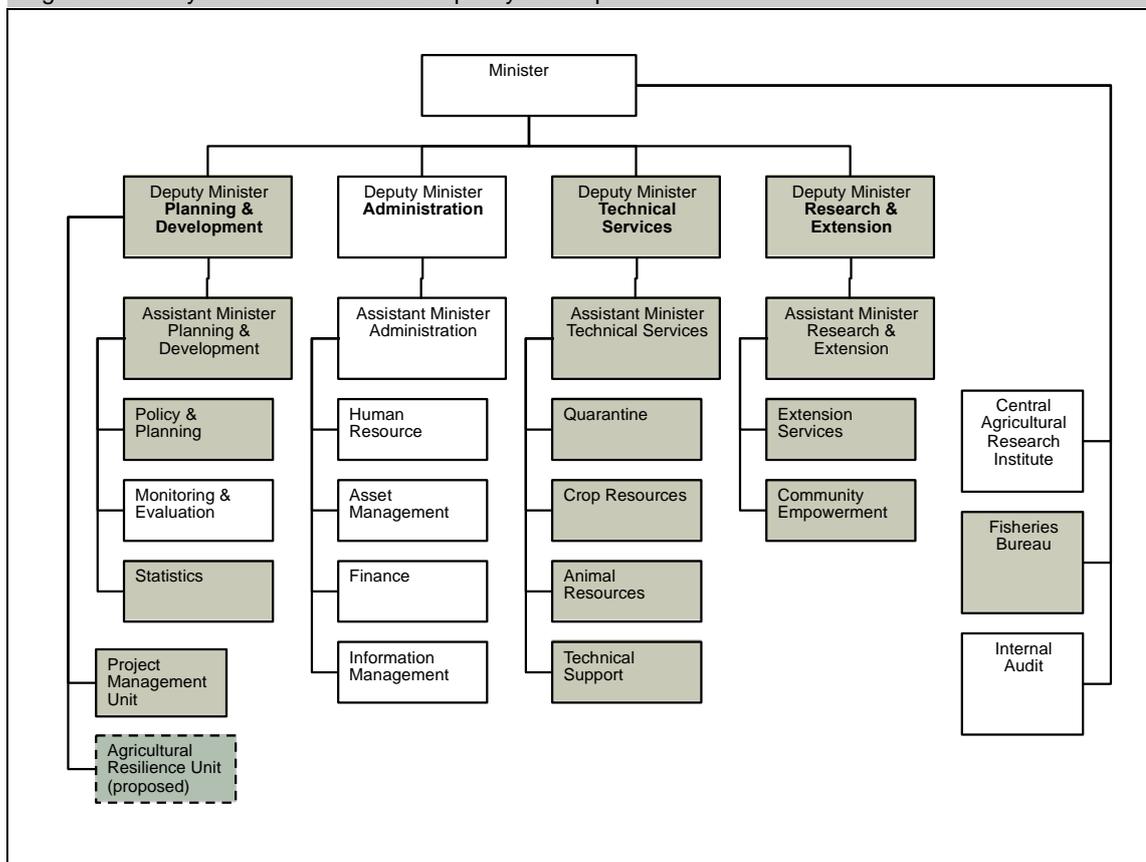
- 6.14 The three priority needs identified are: 1) a program of national research on adaptation in agriculture; 2) field level research, to support and monitor adaptation measures and 3) the development of teaching courses on agriculture resilience for agricultural students.
- 6.15 The focus will be on support to the University of Liberia and Cuttington University, because they are the main institutions for training students who will take on future roles managing climate change and because they have already has some research capability. The idea is that research and educational tools developed in these two institutions will be rolled out to other tertiary and research bodies in Liberia. The other main organisations for agricultural research, the Central Agricultural Research Institute (CARI), is benefitting from substantial support from other projects. The Universities are also receiving other support and so the focus of the CCAAP project should be on adding a climate change adaptation component, not providing mainstream support.

Capacity development priorities for Individuals

- 6.16 The CCAAP project plans to benefit 60 technical staff in MoA and key partners, 30 extension workers and 100 students.

Priority divisions in MoA

Figure 4: Priority areas in the MoA for capacity development



Source: Adapted from MoA Organogram

6.17 The staff that are the priority for capacity development within the MoA are in the divisions listed in Figure 4. They include three of the four departments and a total of ten divisions or units with technical experts. The needs assessment has also indicated that there is a need for a new unit within the MoA, dedicated to agriculture resilience (long-term adaptation and short-term disaster risk management). The MoA organogram itself illustrates the need for this because there is currently no arrangement for dealing with cross-departmental issues, other than the Minister. Each department is stacked separately. The Project Management Unit is an exception to this rule, as it brings together projects that support various aspects of the MoAs work; hence it has a coordination function.

Ministers

6.18 Strong support from Ministers is essential for the project, because it requires leadership to promote a new approach throughout the MoA and with partners. Without Ministerial backing, technical staff will not be able to carry out the policy development and coordination work that is necessary. Ministers need opportunities to increase their knowledge of climate change adaptation and so the process for developing an agricultural resilience policy statement should include support for Ministerial involvement.

Technical staff

6.19 All technical staff in relevant divisions or units need general/introductory training in the essentials of climate change and agricultural adaptation. To ensure that this is done in a practical way, it should be based around the development of a and this can best be provided through the policy-based training described above. In addition, training and mentoring in a number of specific areas is required. It is proposed that this is done in a way that is fully applied, i.e. a ‘learning by doing’ approach in which training is given on topics that are then immediately applied in the on-going work. Although the CCAAP project is being piloted in two counties, the goal of the MoA is to promote suitable adaptation practices across Liberia and therefore, from the outset, staff need to be researching potential funding sources and developing proposals for the roll out and ‘mainstreaming’ of climate change adaptation. Capacity support for the task of fundraising is therefore important.

Table 9: Specialist training needs

Subject knowledge	Technical skills
Policy making	
<ul style="list-style-type: none"> • Agricultural adaptation in Liberia • National, regional and international frameworks and policies for climate change adaptation 	Policy making for climate change adaptation in agriculture Policy delivery planning and performance management
Policy delivery	
Policy delivery principles and methods International financial instruments for climate change adaptation and mitigation	Policy delivery planning and management Proposal writing skills
Coordination	
Climate change policy and process (national and international) National Disaster Risk Management Meteorological systems and early warning systems	Policy and project appraisal (particularly use of EIA and SEA) Cross-sectoral coordination Contingency planning for agricultural climate/weather

	emergencies
Extension	
Farm-level adaptation practices (specific agenda to be determined by Farmer Field School curriculum arising from component 2) Climate change and agricultural impacts	Participatory and farmer-led approaches to extension service provision. Interpretation of meteorological data

Source: D Rothe, from needs assessment consultations and literature review

Extension workers

- 6.20 Training for extension workers should be phased so that specific and immediately applicable information and skills is given to those who are working in the pilot counties. The curriculum of the Farmers Field Schools should be used to determine what training is provided; indeed much of this training will come through component 2.
- 6.21 After the Farmers Field Schools have become established and some experience with adaptations has been gained, then this information should be spread out to all extension workers. Those with experience from the sites can act as Trainers.

University Staff

- 6.22 The target of 100 students benefitting from the project will be reached through University staff. The capacity support needed by staff is largely funding to enable them to do the work of developing teaching materials on agricultural adaptation and to finance a program of research. A costed proposal for both aspects is being developed by the Universities as part of the CCAAP project.

Annex A: Adaptation practices for West Africa: From International Literature

Adaptation practices	Farming activities	Typical Barriers to adoption
Rain water harvesting (Water storage, for drought and to control run-off.)	Dams, with 'buffer' storage capacity to cope with extreme events.	Labour, Cost, Knowledge, Risk (e.g. dam bursting)
Irrigation (for drought)		Cost, labour, knowledge, lack of technology
Soil management (protecting fertility)	Increasing the infiltration capacity of the soil, increasing water holding capacity, improving soil structure and conditions for soil fauna and flora, thereby increasing natural soil fertility	Knowledge Traditional practices (e.g. burning)
Seed management	Drought tolerant and faster maturing varieties	Cost, Cost of inputs Consumer preference (prefer taste of traditional rice). History of adoption in many countries is very poor
Crop management	Crop rotations Mixed cropping/inter-cropping Switching to other/higher value crops Fallowing, Alley cropping	Knowledge Investment labour/capital
Agro-forestry		Lack of technical skills Lack of investment capital Small holders have great difficulties accessing carbon trading funds.
Avoiding deforestation or reforestation	Conservation agriculture Agro-forestry	See above
Pest & Disease management	Use of pesticides/insecticides Biological controls Contingency planning	Cost Availability Danger of misuse/pollution Lack of effective planning and delivery systems and management capability
Livestock management	Fodder substitution Animal substitution enclosures	Cost and availability of fodder & animal alternatives. Cost of fencing and labour for enclosed livestock management
Farmer group organisation	Self help Financial groups (SHFG) Savings & Credit schemes Water Management Associations etc. Market associations	Tend to collapse in crisis, unless backed by bigger institution.

Source: Various references (see references in main report) summarised by author

Annex B: Current agriculture policies and their impact on climate resilience

Agricultural Activity	Current Strategy (2010 Food & Agriculture policy)	Climate Impact		
		+	N	-
Rice (principal food and commercial crop)	<ul style="list-style-type: none"> Sustainable sufficiency in rice attained through self reliance, with much greater focus on production from swamp/lowlands, and by small holders; Sustainable transformation of traditional subsistence rice farmers into commercial rice farmers focusing on increased access to essential inputs, improved strategies for upland cultivation, mechanization, value addition and linkages to markets; Large-scale commercial rice farms established through the direct involvement of the private sector (national and foreign), within specified agro-ecological zones that offer comparative advantages in rice production. Such enterprises will enter into for partnership agreements with smaller commercial rice producers as out-growers to the enterprises; Value addition and development of a commercial rice industry, with rice value chain development starting at the farm level; and Establishment of a Rice Development Fund and a Rice Advisory Board. 			□
Cassava (second most important crop)	<ul style="list-style-type: none"> Intensified diversification in the production and consumption of food other than rice Creation and expansion of markets and/or outlets through promotion of value addition, product development, wider trade arrangements, establishment of special food reserves and special feeding programs for which cassava is an advantage. Intensified production of raw materials for industries and animal feed, Expand production to supply raw materials for industry 			□
Other (vegetables etc.)	<ul style="list-style-type: none"> Intensified and large scale production of other food crops for food security enhancement (household and safety nets) and to meet market and industrial demand; Creation and expansion of markets and/or outlets through promotion of value addition, product development, wider trade arrangements, establishment of special food reserves and special feeding programs to absorb competitive selected food crops being produced locally and by targeted producer groups; and Intensified production of selected food crops such as vegetables, tubers, cereals, and oil for agribusiness. 			
Rubber (most significant crop in terms of formal employment and export earnings)	<ul style="list-style-type: none"> Rehabilitation and revitalization of the rubber sub-sector, taking into consideration the current global demand for rubber and opportunities for local value addition, to raise incomes and improve livelihoods for large numbers of smallholders of the crop; Ensuring that rubber is used as a means of transitioning the mass of subsistence farmers into commercial agriculture via out-grower schemes. 			

	<ul style="list-style-type: none"> Encouraging downstream activities through use of appropriate investment incentives. 			
Oil Palm (2 nd most important tree crop)	<ul style="list-style-type: none"> Increased production and productivity of palm oil, especially among small holders, to facilitate rapid increase in rural incomes, employment, export earnings and public revenues; Enhancing Liberia's preparedness as an exporter in the oil palm sector, based on its comparative advantage in production, strategic location and the rising demand for Oil Palm in the world; and Increasing foreign exchange, job creation, income generation and widening the revenue base in the industry through value addition and other interventions. 			
Cocoa, Coffee	<ul style="list-style-type: none"> Increased production and productivity of Coffee, Cocoa, and Oil Palm in order to add to rapid increase in rural incomes, employments, export earnings and public revenues; Enhancing the participation, particularly competitiveness of small scale - private sector agents, in processing and other value addition activities and marketing via support to small holders schemes. 			
Livestock	<ul style="list-style-type: none"> Adequate quantities of competitive (quality, safe and low price) locally produced livestock products (lamb, poultry, beef, other meats and dairy) available in the country and substituting imports of these commodities through lower domestic resource costs; A revitalized livestock sector and its value chains (production, processing, marketing and product development) are contributing significantly to productive employment, especially of women and youth, and the improvement of the nutritional status of Liberians; and A restocked livestock sub-sector, especially with small ruminants (sheep and goats, pigs and other commercial small ruminants). A great consideration to the current development in regional trade liberalization, globalization, privatization and enhancement public-private partnership, public information, awareness and participation, science and technology, which directly impact the development of the livestock sector. Promotion of value addition in order to access competitive markets by providing enough quantities of locally produced livestock products at affordable price to substantially substitute imports. 			
Fisheries (12% of agri DP and key food. Local artisanal fishing and foreign owned industrial)	<ul style="list-style-type: none"> Sustainable increase in artisanal fish production with immediate impact of available fish supplies from the sub-sector contributing largely to the demands of the largest number of Liberians, and more particularly enhancing the income generating opportunities of women and young men; Sustainable increase in fish landings in the country by industrial fisheries operators providing increased fish supplies to the population, income, revenue, employment, trade in high value markets and product development, through the establishment of infrastructures and enforcement of legislation; and A well revitalized and developed aquaculture industry with high productivity; sustainable supplies and affordable quality fish to local and export markets. 			
Extension Service	<ul style="list-style-type: none"> Dynamic, demand-driven, client-oriented, participatory, decentralized, pluralistic, extension services, providing technical knowledge and information to farmers, particularly small holders in agriculture improvement, food and nutrition security matters; Public and private sector partnerships in the provision of and cost sharing of extension services for increased competitiveness in the value chains of selected food and cash commodities; A conducive and enabling environment for provision of extension 			

	<p>services by the private sector, NGOs and other organizations, and effective communication and dissemination of information to all users; and</p> <ul style="list-style-type: none"> • An extension system in the country characterized by a continuous flow of appropriate innovations from a variety of sources, including local and foreign. 			
<p>Environmental sustainability</p>	<ul style="list-style-type: none"> • Nation wide awareness and mainstreaming environmental considerations in all agricultural activities: production, processing; manufacturing; value addition; marketing; and • Appropriate policy instruments established and enforced, in order to ensure environmental protection from agricultural and related land use activities including logging, grazing, mining, and fishing. 			

Source: Liberia Food and Agricultural Policy Strategy, 2008

Annex C: Capacity support from other agricultural projects
