

Document of

COMMON FUND FOR COMMODITIES

**Improving cotton production efficiency in small-scale farming systems
in East Africa (Kenya and Mozambique) through better vertical integration
of the supply chain
(CFC/ICAC/37)**

PROJECT DOCUMENT



Stadhouderskade 55
1072 AB Amsterdam
The Netherlands

tel. +31 20 5754949
fax. +31 20 6760231
www.common-fund.org
e-mail: managing.director@common-fund.org

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Project Summary

- 1. Project Title:** Improving cotton production efficiency in small-scale farming systems in East Africa (Kenya and Mozambique) through better vertical integration of the supply chain
- 2. Duration:** 48 months
- 3. Location:** Kenya and Mozambique
- 4. Nature of Project:** Improving profitability and competitiveness of smallholder cotton production, making it an attractive enterprise providing a sustainable supply of seed cotton to local ginneries.
- 5. Brief description:** The **project purpose** is to “improve cotton production efficiency through formulation and promotion of ICM options in cotton production systems in Kenya and Mozambique by involving private enterprises and public organizations”. This is in line with ICAC’s strategic objective of facilitating the development and implementation of better management practices (BMP) that result in more sustainable production of cotton. The project will include 1) Introduction of best practice Integrated Crop Management (ICM) packages; 2) Promotion and adoption of ICM packages; 3) Building stakeholder linkages for sustaining ICM; 4) Evaluation of the impact of ICM adoption; and 5) Project management and coordination.
- The project will build linkages within the value chain to ensure farmers have access to inputs, technologies and information that will enable them to produce more cotton more competitively and with greater profitability.
- 6. The estimated total cost:** US\$ 2,457,000
- 7. Financing by the Fund:** US\$ 1,464,600. Of this amount Euro 715,000 is being co-financed by the European Union through its All ACP Agricultural Commodities Programme¹⁾ and US\$ 250,000 originates from earmarked contributions of the OPEC Fund for International Development to the CFC resources.
- 8. Mode of financing from CFC:** Grant

1) Please see **NOTE** on next page.

9. Counterpart contribution:	Kenya	US\$ 562,850
	Mozambique	US\$ 307,550
	PEA	US\$ 122,000
	Total	US\$ 992,400

10. Project Executing Agency (PEA): CABI Africa
ICRAF Complex
United Nations Avenue
Gigiri
PO Box 633-00621
Nairobi, Kenya
Tel: +254 20 7224450, Fax: +254 20 7122150
E-mail: M.Akiri@cabi.org
Contact person: Mr Morris Akiri

Project Implementing Agencies: **Kenya**
Kenya Agricultural Research Institute (KARI)
Contact person: Dr Lusike Wasilwa
Email: director@kari.org

Mozambique
Instituto do Algodao de Mocambique (IAM)
(Mozambique Cotton Institute)
Contact Person: Dr Norberto Mahalambe
Email: nmahalambe@iam.gov.mz

Ref. also Section 3.3

13. Supervisory Body: International Cotton Advisory Committee (ICAC)

14. Estimated Starting date: December 2009

Note:

The European Commission's **All ACP Support Programme on Commodities** is a EUR 45 million programme developed in the framework of the "EU Action Plan on Agricultural Commodities, Dependence and Poverty" and the "EU-Africa Partnership for the Cotton Sector Development". The overall objective is to improve incomes for producers of traditional or other agricultural commodities and reduce income vulnerability at both producer and macro level. The purpose of the programme is to strengthen the capacity to develop and implement sustainable commodity strategies that improve farmers' productivity and livelihoods and reduce income vulnerability. The Common Fund for Commodities is one of the International Organisations involved in the implementation of the Programme. The Fund's activities focus on providing support (and finance) for the implementation of commodity specific projects with a multi-country focus. The current project on "Improving cotton production efficiency in small-scale farming systems in East Africa (Kenya and Mozambique) through better vertical integration of the supply chain" is the second cotton project jointly funded by the CFC and the EC within the framework of the Programme.

Project Logframe

Narrative summary	Objectively verifiable indicators	Means of verification	Assumptions
Goal:			
Reduce rural poverty, improve farmers' livelihood, and promote sustainable agriculture in cotton based cropping systems in Kenya and Mozambique	<p>By end of project, improved ICM strategy promoted in order to achieve beneficial impact on livelihoods of poor people and, are contributing one or more of the following:</p> <ul style="list-style-type: none"> • Increased and/or stabilised production • Increased productivity (yields/ha, land use, labour, capital) • Reduced use of banned &/or restricted pesticides • Enhanced marketing opportunities 	<p>Reports of target organisations</p> <p>Programme and external evaluations</p> <p>Reports of national and local level surveys of improved benefits (productive capacity, food security, wealth, nutrition and environment).</p> <p>Impact assessment reports and government statistics of agricultural productivity</p>	<p>Conducive agricultural policies of governments and commitment of participating organisations</p> <p>Political stability in Kenya and Mozambique</p>
Purpose:			
To improve cotton production efficiency through formulation and promotion of innovative ICM options in the cotton production systems in Kenya and Mozambique by involving private enterprises and public organizations	<p>a. Cotton yield in participatory trial demonstration plots is at least 50% of a best variety field trialled in country</p> <p>b. Pesticide use reduced by 50% by farmers participating in the project</p> <p>c. Net income of farmers participating in the project increase by at least 30%</p>	<p>Trade statistics by cotton associations.</p> <p>Statistics by the national cotton bodies.</p> <p>End-of-project impact assessment report</p>	<p>Cotton yields are not affected by adverse climatic conditions or unprecedented pest attack</p>

Outputs:			
1. Best practice ICM packages formulated	2 Training of Trainers Workshops held 25-30 resource persons trained per TOT	Reports, training manuals	Circumstances at the time of the formulation of the ICM strategy do not change significantly prior to implementation of the training Willingness of ginneries to commit resources to produce training manuals
2. Promotion and adoption of ICM packages	240 Farmer Field Schools established Number of farmers adopting the formulated ICM package Net income to farmers improved 50% reduction in pesticides use	Numbers of farmers attending FFS Reports from FFS Surveys reports confirming adoption	No unusual adverse biological or biophysical effects on cotton production Availability and willingness of potential trainers/farmers Farmers have ready access to required Inputs
3. Stakeholders linkages built for sustaining ICM	4 Stakeholder Awareness Workshops planned and held Stakeholder linkages established Lessons learned and best practices widely circulated	Project progress report, including semi-annual reports, workshop reports	Local actors in cotton value chain maintain positive relations
4. Impact study of ICM adoption made	Data on benefits of ICM, available by end of project	Impact assessment reports Project reports, Publications.	Impact is seen within the timeframe of the project
5. Project management and coordination	Project outputs delivered as per the logframe	Reports of PEA and PIAs and collaborating institutions	Resources are available and in good time
Activities:			
<i>1. Best practice ICM packages introduced</i>			
1.1 Participatory analysis of needs and constraints of farmers and markets undertaken		Project documentation – reports, training materials curricula produced	Stakeholders and partners are willing and able to participate in needs
1.2 Analysis of farmers' existing agricultural practices, production			

<p>patterns, post harvest handling conducted</p> <p>1.3 Appropriate ICM models and Training of Trainers curricula formulated</p> <p>1.4 Ginneries supported in the production of quality training and promotional materials on best ICM strategy</p>			<p>analysis</p> <p>Ginneries are willing to support the project</p>
<p><i>2. Promotion and adoption of ICM packages</i></p> <p>2.1 Identify individuals that will act as trainers (facilitators) for the FFS demonstrations plots</p> <p>2.2 Conduct training of trainers (ToT) workshops</p> <p>2.3 Selection of demonstration sites from existing FFS</p> <p>2.4 Establishment of on-farm demonstrations plots within selected FFS</p> <p>2.5 Conduct farmer-participatory agro-ecosystem analysis (AESA) at selected demonstration sites</p> <p>2.6 Mentor and backstop trainers as they train farmers</p> <p>2.7 Dissemination of best ICM strategy through farmer field days and mass media</p>		<p>Project documentation-workshop reports, training materials and curricula for FFS and TOTs;</p> <p>Dissemination outputs</p>	<p>Stakeholders and partners are willing and able to participate in training</p> <p>Suitable candidates as trainers are available</p>
<p><i>3. Build stakeholder linkages for sustaining ICM</i></p> <p>3.1 Conduct stakeholder mapping of value chain and produce plan for workshop</p> <p>3.2 From 3.1 conduct a workshop annually to plan /review pilot schemes in each country</p> <p>3.3 Implement pilot schemes</p> <p>3.4 Final stakeholder learning workshop- sharing lessons learned on pilot schemes</p>		<p>Project documentation, value chains mapped; workshop plans and reports</p> <p>Pilot schemes planned and implemented; results synthesized and lesson learned disseminated</p>	<p>Stakeholders and partners are willing and able to interact</p>
<p><i>4. Impact assessment of ICM adoption made</i></p> <p>4.1 Conduct Baseline Survey (linked to activity 1.3) to establish pre-adoption socio-economic situation and production practices</p>		<p>Survey reports available</p>	<p>No factor external to the project has had a negative effect on the impact</p>

<p>4.2 Conduct impact assessment (before and after analysis)</p> <p>4.3 Synthesise and analyse the findings(compare adopting vs no adopting farmers)</p> <p>4.4 Disseminate the findings of the impact assessment</p>		<p>Impact reports available</p> <p>Findings disseminated</p>	<p>of the project such as cotton farmers decide to grow other crops between start and end of the project</p>
<p>5. <i>Project management and coordination</i></p> <p>5.1 Support organization of an inception workshop and support establishment of CFC administrative and accounting procedures and train local counterparts in project procedures</p> <p>5.2 Advise on operational procedures and initiate consultancies where necessary</p> <p>5.3 Assist PIAs and ICAC to prepare necessary documentation, including budgets and work plans.</p> <p>5.4 Liaise between project donors and implementers and arrange exchange visits</p> <p>5.5 Monitor project progress and report on inputs (disbursements), activities undertaken and outputs achieved (to include mid-term impact review and expenditure audits).</p> <p>5.6 Assist PIAs and partners with planning and co-ordination of activities aimed at providing uptake pathways for outputs</p> <p>5.7 Prepare regular progress reports, mid-term evaluation report, annual accounts, audits and project completion report.</p>		<p>Procedure manual</p> <p>Report of inception workshop</p> <p>Quarterly financial reports</p> <p>Progress reports, mid-term evaluation report, annual accounts and audits, project completion report</p> <p>Work plans produced</p> <p>Visit reports produced</p>	<p>Financing from all sources made on a timely basis in tandem with proposed activities & annual work plan, budget etc.</p> <p>Personnel, including external consultants, competent in required skills can be identified & commit to project activities</p> <p>The PEA & partner institutions co-ordinate & execute project efficiently.</p> <p>All project participants remain committed to project purpose.</p> <p>Socio-political developments do not prevent effective project implementation</p>

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1. INTRODUCTION

1.1 Project Background

The project is designed as a pilot project to develop effective and sustainable means to address the low cotton productivity in Eastern and Southern Africa. It is targeted to bridge the gap between the high yield results obtained at agricultural research stations and the low yields obtained at small-holder cotton production units. In consultation with the International Cotton Advisory Committee, the Fund's designated international commodity body for cotton, CABI Africa has been identified as a technically qualified, not-for-profit agency, capable to develop and implement the project. The project has been designed with the objective to result in a net farmer income increase in the range of 30%. The project aims to contribute in a sustainable manner to increasing the productivity and lowering the production costs for small-holder cotton farmers in Kenya and Mozambique. Making use of the concept of Integrated Crop Management (ICM), jointly with intensive farmer involvement, Transfer of Technology programmes and physical input supply systems, the proponents consider yield increases of 50% feasible as well as a reduction of pesticide use of around 50%.

The proposal was reviewed by the Fund's Consultative Committee in its 43rd meeting of January 2009. While acknowledging the relevance of the project, the Committee made some suggestions to improve the design of the project. The following is the relevant excerpt of the Committee's report:

Deliberation in the Forty Third Meeting of the Committee

The Committee agreed that the proposed project objective of increasing the market competitiveness of smallholder farmers was supportable. However, a number of questions have been raised:

- *the costs of project coordination were found to be high and needs to be reduced;*
- *the mechanism for supply of seeds for demonstration to smallholder farmers was not clear and needs to be explained;*
- *given the prominent role of cotton ginneries in the project, the Committee was concerned that a proper balance should be established between the interests of farmers and ginneries to ensure that all project participants benefit;*
- *the allocation of the budget between the PEA and the participating local institutions was not clear. The Committee was concerned that the proposed PEA could overstate the research component of the project at the expense of practical actions on the ground. This allocation of funds between the PEA and the participating institutions would need to be elaborated.*

In light of the questions raised, the Committee felt that the proposal would require major reformulation before it could be reconsidered for approval. The Committee agreed to reconsider the revised project proposal addressing the issues raised above in one of its future meetings.

The observations made by the Committee were communicated to the proponents and subsequently addressed in a revised version of the project proposal, which was reviewed by the Consultative Committee in July 2009. The Committee then concluded as follows:

Deliberation in the Forty Fourth meeting of the Committee

The Committee considered the revisions made in the reformulated proposal to address the concerns expressed previously. In particular, the Committee was satisfied with the elaborated sections of the project concerning

- *establishment of a system for production of certified seeds on the basis of a three-year cycle system as explained in the revised project document;*
- *annual supply of certified seeds to farmers in Kenya and Mozambique;*
- *the allocation of funds between the PEA and participating local institutions, which was included in the document.*

The Committee further noted that measures have been taken to address the balance of interests between farmers and ginners to maintain the legitimacy and credibility of the project as a multi-stakeholder development action. The Committee agreed that failure to balance the interests of farmers and ginners would continue to present a serious risk to the fundamental objectives of the project, and recommended that the matter should receive continuous attention during the course of implementation of the project.

Concerning the measures taken to address the budget reduction in the project, the Committee agreed in principle that the budget had been reduced as recommended. However, the Committee was concerned about the approach taken to achieve the reduction of the budget by reducing the time allocated for coordination of project activities. In this regard, the Committee agreed to recommend that:

- *the PEA should carry out the project in the best interest of the intended project beneficiaries, allocating the time required for coordination on the basis of actual need rather than reducing it arbitrarily for a formal reason;*
- *in the case that more coordination work than envisioned in the current proposal was required for the implementation of the project, the PEA should make a commitment to provide the necessary additional time as counterpart contribution without extra financial support from the CFC, and without reallocation of resources from other components of the project.*

Subject to the conditions indicated above, the Committee agreed that the concerns expressed with regard to the project proposal having been satisfactorily addressed recommended the project proposal for approval by the Executive Board.

The Executive Board in its 48th Meeting on 19 – 21 October 2009 took note of the views and recommendations of the Consultative Committee and approved the Fund's contribution to the project for a total amount of upto US\$ 1,535,320. This amount includes a provision for CFC costs for management of the EC co-financing contribution, making a total amount of up to US\$ 1,464,600 available for the project.

1.2 Project Rationale and Objective

Cotton is one of the most important sources of income for smallholders in many of the semi-arid regions of Africa. However, profitability for small producers is often marginal due to average yields that are well below the potential of varieties grown under rain fed conditions. In Southern and Eastern Africa, average yields range from 400-750 kg/ha of seed cotton²⁾, while those in research plots often average 3,000 kg/ha and above. Cotton yields are low mainly due to poor quality planting seeds, poor and untimely land preparation, inadequate pest control measures. Because of the low production, low productivity and

2) 1 kg of cotton lint corresponds to about 3kg of seed cotton (depending on ginning efficiency)

vulnerability to low cotton prices, farmers often resort to growing alternative crops or diversify their businesses in other ways to avoid cotton growing.

However, there is a wide scope for improvement in production efficiency in the smallholder cotton sector. This may be done by placing the initial emphasis on profitability for the grower, rather than increased yields. This can be addressed by ensuring that systems are in place to maximize the benefits of input use through promoting integrated crop management (ICM), backed by greater investment in the provision of technology and associated support services. One way to do this is to encourage input and service delivery by the private sector (ginning companies) through a vertically integrated commodity chain. It is in the interest of the private sector to promote improvement in cotton quality and numbers of farmers involved in producing cotton. Improved access to technology and the support to improve farmers' knowledge of cotton ICM will improve the efficiency of input use that in turn, will encourage more farmers to grow cotton and lead to increases in national production as well as increasing the average yield. Better management of inputs will also have a positive effect on the environment.

The project addresses one of the key priorities of the Fund's 3rd Five-Year Action Plan, namely to support the sustainability of small-holder commodity production, thus enabling small-scale commodity producers to obtain a reasonable income from their production. Concepts like "Best Management Practices" are stated to present an opportunity to limit adverse impacts of commodity production and the ICM envisaged in the project may be seen as fitting in that concept. In addition, the project has a direct beneficiary focus on small-scale cotton producers. The project is endorsed and submitted by the International Cotton Advisory Committee, the designated International Commodity Body for cotton. The project falls within the priority programme "Sustainable Production Systems with a focus on the early stages of the production/processing chain". The project specifically addresses the stated gap between production efficiency at research farms and the significantly lower yields obtained in small-holder production situations. This intervention is included as Programme 4.1, reflecting the ICAC's identified priority subjects, in the Fund's 3rd Five-Year Action Plan.

The project aims at directly improving farmer income derived from small-holder cotton production. It is envisaged that net farmer income will increase with about 30% (resulting from yield increase and input reduction). The project will not undertake research in isolated research offices/building or requiring major investments. The larger part of the project is directly aimed at exchanges with the immediate beneficiaries in the farmer fields through hands-on training and dissemination programmes. Added benefits can be found in the derived strengthening of farmer organizations, adding to the sustainability of the developments initiated by the project. Important to mention also is the strengthened link between farmers and the cotton buyers (ginneries) who will benefit from increased productivity/production, thus enabling the ginneries to run with higher levels of capacity utilization, thereby reducing the cost of lint produced.

The project appears to be feasible in its envisaged implementation. It is to be noted, however, that the issue addressed (how to convince farmers to adopt modified production techniques/practices) is not novel and that a wide range of initiatives world-wide have been and are being tried and operationalized. The project does not aim to develop novel technologies or to introduce new or thus far unknown practices to be used by the targeted beneficiaries, the small-holder cotton producers. The project aims to develop, in close consultation with existing research facilities, extension programmes, market partners and of

course the identified beneficiaries themselves, operational, sustainable improved practices which will enable the farmers to secure higher net incomes from their cotton production.

Crucial in this respect is not the introduction of advanced levels of technology, but to secure good institutional practices and operating environments. The concept of teaching/training farmers to adjust their production activities embedded in a reliable network-based input and services supply system may work, but is heavily relying on the effectiveness of the transfer of technology mechanisms and on the strength of the network arrangements set up or strengthened by the project. Many similar systems have been operational for a short period but collapsed after the end of project/intervention period. Crucial in this respect is the “acceptance” by the farmers (and the ginners) of the proposed modifications in the production practices that are supposed to lead to higher yields/higher income. Stake-holder involvement at all levels is thus of key importance for the possible success of the project.

The project will be conducted in two countries, Kenya and Mozambique. These countries were selected for a number of reasons:

- In both countries the cotton sub-sector is underperforming, both nationally and at farm level where yields are well below potential. Thus there is the opportunity for the project to have a significant impact;
- Both countries requested to be involved in such a project (and so have been actively involved in its preparation);
- The countries provide a number of contrasts that will be useful for lesson-learning, whereby it will be of particular importance that Mozambique operates a zone or concession system, while in Kenya a more market-oriented system is in place.

The project’s ultimate **objective** is to improve cotton production efficiency through formulation and promotion of innovative integrated crop management options in small-holder cotton production systems. This entails

- empowering the farming community in on-farm decision making;
- enhancing skills of small-holders in quality cotton production;
- raising awareness of farmers about international sanitary and phytosanitary standards of production procedures of cotton;
- reducing health hazards to pesticide users and consumers through rationalizing use of pesticides by developing awareness, training and participatory trials;
- developing a holistic approach to cotton management and development by strengthening linkages among service providers and farming communities from the pre-sowing stage up to post-harvest management.

Within the time frame of the project, the targeted 6,000 participating farmers should be able to obtain increased yields which should be at least 50 % of the best yields obtained in the field in each country; pesticide use (and thus costs!) should be reduced by 50%; and net income of participating farmers should be increased with at least 30%.

1.3 Project Outline

Challenges: Cotton is a rare economic success story in SSA, generating income for millions of smallholder households and allowing the continent to capture a rising share of world trade (Africa’s share of overall world trade fell by half from 1988 to 2000, but its share of cotton trade increased by 30%). Specific characteristics of the crop, especially the need for purchased inputs and the typical inability of smallholders to access these on a cash basis, has

fuelled concern that the economic reforms sweeping the continent since the early 1990s may derail this remarkable success story (Tschirley *et al*, 2006). However, on a global basis Africa's percentage of global cotton production for 2008/09 is only 4.8%, compared to 62.3% for Asia (ICAC, 2008) so there is considerable scope for improvement. African productivity is low compared to the more efficient producers in other developing countries especially Asian countries such as China, Pakistan, Syria and Turkey. Taking full advantage of structural reforms and improved production methods will strengthen the cotton sector's role in Africa development.

In **Component 1** the project will formulate and introduce an innovative Integrated Crop Management (ICM) strategy based on a Farmer Participatory Training and Research approach for adoption by cotton farmers. ICM is a holistic systems approach to increasing the profitability of agricultural production that incorporates appropriate technologies and best agricultural practices such as the use of crop rotations, appropriate cultivation techniques, careful choice of seed varieties and minimum reliance on artificial inputs such as fertilisers and pesticides, better management of on-farm resources, and environmental conservation. Farmers and other stakeholders will be interviewed through Focus Group Discussions (FGD) and Key Informant Interviews (KII to identify the key constraints related to cotton production and marketing, analyzing issues along the whole cotton value chain ranging from pre-sowing to post-harvest. Farmers' existing agricultural practices, production patterns and post harvest handling will be reviewed to identify gaps in understanding. Training materials with the appropriate ICM technologies will be developed, prioritized and collated for Training of Trainers courses (ToTs) for government extension staff of both Kenya and Mozambique. Another output of this component is the compilation of promotional materials (manuals, brochures and fact sheets). The training materials will also draw from training materials will be drawn from all the relevant stakeholders including previous CABI's experience in South Asia and East Africa.

This training will be undertaken in **Component 2** through ToTs, establishment of field demonstration plots, Farmer Field Schools (FFS), production and dissemination of high impact training and field days. The training programme will cover technical content to fill knowledge gaps and discovery learning approaches that will be used to build the capacity of farmers. Individuals who will act as farmer trainers (facilitators) and participate in the ToTs will be selected from local extensionists, input suppliers and the ginners. A series of training workshops will be held to build a cadre of individuals that are able to work effectively with farmers. After the ToTs, the identified ICM technologies will be introduced to demonstration plots and FFS in the cotton growing regions in each country. Where possible, the demonstration plots will be managed by the FFS farmers, with facilitation from the trained trainers to ensure sustainability after the project has finished... The FFS demonstration plots will be used for field days to be conducted in each target district, to which farmers and other stakeholders will be invited.

In order to build stakeholder linkages for sustaining ICM, an analysis will be conducted in both countries in **Component 3** to evaluate existing and potential systems for delivery of inputs and technical support. The aim will be to identify how current systems can be improved, particularly through vertical integration. An important activity in this component is stakeholder awareness workshops which will be held on an annual basis in each country. The different situations in the two countries provide opportunities for cross-learning. The main stakeholders (farmer associations, ginneries, private sector input providers, regulators, extension, commodity development bodies) will together design and implement

pilot schemes for specific areas, which will be evaluated for lesson-learning. Recommendations for up- and out-scaling the effective approaches will be made, including at policy level. Options to be considered will include different types of contracting/credit arrangements between producers and ginneries (linked to input supply), concession systems, and methods to improve information flow between stakeholders including research.

Component 4 will evaluate the impact of ICM adoption. At the start of the project, a baseline survey will be conducted through Focus Group Discussions (FGD) and Key Informant Interviews (KII), using questionnaires and checklists, to establish the pre-adoption socio-economic situation and production practices of participating farmers. The information generated will describe the production systems of the participating farmers, their yields, inputs, costs and constraints, and what farmers feel needs to be improved within these systems. Initial farmer perceptions of ICM technologies, their socio-economic situation and resource endowment will be evaluated. Farmer criteria for evaluation of ICM technologies will be developed using participatory approaches and subsequently used to evaluate the packages being promoted. An impact assessment or post adoption socio-economic survey will be conducted to compare adopting vs. non-adopting farmers of the ICM package. In the context of this survey, a ‘before and after’ analysis will be carried out, and a comparison made between “adopters” and “non-adopters”, to measure impact of the technologies and their contribution to farmers’ income and livelihoods. The results will be disseminated widely.

Project management and coordination will be dealt with under **Component 5**. CFC administrative and accounting procedures will be established and local partners provided with relevant training. A project inception meeting will be conducted to clarify project objectives and activities, develop detailed work plans and budgets, and establish lines of communication and pathways for dissemination of project outputs. A monitoring and evaluation plan will also be developed with stakeholders and implemented. Annual planning and review meetings involving representatives from ICAC, PEA, and implementing agencies and collaborating agencies will be conducted. In the meetings, progress will be evaluated against work plans and the logical framework, using the quantitative and qualitative indicators contained therein. Work-plans for the subsequent years will be agreed. A midterm evaluation of the project will be undertaken to improve project delivery and an independent terminal evaluation of the project will be undertaken.

1.4 Overview of the commodity

Cotton is a major agro-industrial crop produced in both developing as well as developed countries. The world cotton industry provides employment opportunities for hundreds of millions farmers and to allied industries such as those relating to agricultural inputs, machinery and equipment, transportation, storage, ginning, bailing, seed crushing and textile manufacturing. Cotton is produced in approx. 80 countries and serves as the economic mainstay of many regions and nations. Over 75% of world cotton production is located in developing countries.

Cotton production for 2009/10 is estimated at 23.6 mln ton (lint), which is about 2 mln ton less than the preceding year. Cotton consumption for 2009/10 is forecasted to remain stable at 23.7 mln, thanks to an expected slight recovery in world economic growth. Prices for the year 2009/10 are foreseen to be in the range of 60 - 65 US cents per pound of lint,

with a strong expectation towards the lower level. Competition in cotton production and trade remains strong. Quality and lot uniformity are becoming increasingly important in international trade, as a result of increasing demands from the user industry (spinning and textile mills).

About 2 mln ton of cotton is produced annually in Africa and the continent accounts for about 8 - 9 % of the world cotton production. Approximately 80% thereof is exported. In some countries, in particular in West Africa, cotton represents more than 50% of national export income and cotton is therefore the largest source of export receipts in several West and Central African countries. Throughout the continent, the cotton sector plays an important role in the fight to reduce rural poverty, with cotton-related activities accounting for a large share of rural employment. It is estimated that about 15 mln people in Africa are engaged in cotton production/processing activities.

According to recent ICAC estimates, average world yields increased to around 795 kg lint/ha in 2007/08. This is in striking contrast with the regional averages of around 385 kg and 270 kg for Western African producing countries and Eastern African producing countries respectively. The current project aims to substantially increase the yields and the related net income for small-scale cotton producers in two selected countries in the Eastern African region (Kenya, with average yields of 220 kg/ha and Mozambique, with average yields of 170 kg/ha).

1.4.1 Description of issues and problems in cotton production in Africa

Poor yields from smallholder cotton in Africa have been a long-standing problem that has not been greatly altered by release of new varieties or by other recommendations made on the basis of research findings. There appear to be a number of problems in translating the outputs from research into the farmers' fields; farmers are consistently not taking up the recommendations. Reasons for this situation include:

1. The National Agricultural Research Institutes (NARIs) do not have an adequate system to ensure that recommendations are followed.
2. The recommendations are infrequently updated and if any training manual is produced it may remain unaltered for many years.
3. Some recommendations are based on high input systems and are not presented as baskets of options from which farmers can select, based on their individual resources and knowledge.
4. Although on-farm demonstrations have now been recognized as one of the best ways to build the capacity of farmers in best practice crop management, their numbers are usually too few to have a large impact.
5. Poor stakeholder coordination.
6. Approaches have often been confused with diverse objectives such as higher yields and decreased pesticide use.

The proposed approach aims at improved cotton production efficiency and profitability. ICM components will be directed to meet these primary objectives with a goal of achieving the following results:

- (i) Cotton yield in participatory trial demonstration plots is at least 50% of the best variety field trialled in each country

- (ii) Pesticide use is reduced by 50% by farmers participating in the project
- (iii) Net income of farmers participating in the project increases by at least 30%

Where there is a degree of vertical integration of the commodity chain e.g. ginning companies providing agricultural inputs to cotton farmers or if a formalized system of 'contract farming' is operating, there is an opportunity to also provide improved technical services. Making inputs available to farmers has proved insufficient on its own to significantly improve yields. The missing component is a consistent ICM package that recognizes the farmers' constraints, backed by technical training support linked to a demonstration program.

Broughton *et al.* (2002) in discussing a farm diversification project for cotton farmers in Mozambique have pointed out that such projects cannot substitute for technical and institutional innovation in the cotton sector itself. Innovation requires both funding and private incentives. They go on to suggest 3 areas where funding is urgently needed in the Mozambican cotton sector: 1. development and multiplication of new varieties; 2. improved pest management; and 3. updated grading systems. They also add a fourth area needing attention: Achieving a mix of public and private provision by engaging all actors in a dialogue to build institutional and policy environments that encourage technological renewal. This proposal aims to deliver technical innovation and to integrate public and private sector initiatives.

However, even where there is such partnership between public and private sector, this does not guarantee impact. For example, where ginning companies have implemented their own system of on-farm demonstrations (OFDs) such as in Malawi, the impact has been limited due to their being too few in number and often they promote inappropriate or out-dated ICM models. There has to be a linkage between the generation of new techniques, methodologies etc and their communication to the end users (the farmers)

The project will address some of the shortcomings of previous or existing initiatives by expanding the OFD programs through farmer participatory training and research developing and promoting scientifically-based ICM systems which are appropriate and acceptable to cotton smallholders and which promote linkages among all important stakeholders both private and public.

Prior to structural adjustment, production-to-market chains for agricultural commodities were integrated under the control of state or parastatal organizations that provided subsidized farm inputs, often provided advisory services, sometimes even provided credit as well as purchasing the commodity from farmers. However, under the structural adjustment reforms government support for input and output markets has been withdrawn in the expectation that private sector traders would fill the niche and develop these markets. In practice, the private sector has proved to be highly risk-averse to investing in enterprises linked to smallholder agriculture, except for a few major cash crops, one of which is cotton.

In the case of cotton, excess ginning capacity in many countries in sub-Saharan Africa (SSA) and the resulting competition for seed cotton, has created incentives for private sector ginning companies to vertically integrate their supply chain. However, this has been less successful in some countries than in others, depending on differences in the regulatory environment and the number of ginning licenses issued. For instance, where there are many ginning companies operating without an agreed zoning system, vertical integration is

undermined by ‘side selling’ where a farmer takes input credit from one company but sells his cotton to another to avoid the repayment (Poulton *et al.*, 2004).

At present in most SSA countries that export cotton, the main constraint to increased farmer revenue and an increased supply of seed cotton to the ginneries, continues to be poor standards of crop management, resulting in average yields that are well below the potential of the varieties.

The balance between cooperation and competition within the commodity chain differs between countries but common constraints can be identified in the cotton sector in most SSA countries. 1. Farmers have poor access to inputs and/or access to credit facilities for their purchase. 2. There is a poor understanding amongst farmers (and other stakeholders) of best practice in cotton production. 3. There is an absence of reliable delivery mechanisms for technical support for producers.

In response to AGOA (African Growth & Opportunity Act) and the expectation of declining cotton subsidies in developed countries, a number of SSA countries are embarking on programmes to stimulate cotton production. The focus is mainly on the provision of subsidized seed, fertilizer and insecticide but missing factors are both the development of sustainable integrated crop management practices and similarly sustainable mechanisms for the delivery of technical support services to the producers...

A number of SSA Governments have provided funds for on-farm cotton demonstrations and some ginning companies operate their own demonstration program. There are three main reasons why these initiatives have not had the desired impact on crop production:

1. The demonstrations are too widely dispersed (not enough demonstrations)
2. Insufficient technical support for the demonstrations to allow feedback to the farmers
3. Inadequacy of the technical packages for ICM and IPM, with sometimes-conflicting recommendations from different organizations.

1.4.2 Overview of the cotton sector in the target countries

The project will be conducted in two countries, Kenya and Mozambique. These countries were selected for a number of reasons:

- In both countries the cotton sub-sector is underperforming, both nationally and at farm level where yields are well below potential. Thus there is the opportunity for the project to have a significant impact.
- Both countries requested to be involved in such a project (and so have been actively involved in its preparation).
- The countries provide a number of contrasts that will be useful for lesson-learning, but particularly in that Mozambique operates a zone or concession system, while Kenya does not.
- ICAC, CFC and CABI mutually agreed on the countries.

Kenya

Under the Kenya Government’s policy for addressing poverty ‘Kenya Vision 2030’,

cotton has been identified as a key sub-sector with the potential to benefit 8 million people in the drier areas of the country. The Cotton Development Authority (CODA) has been set-up to co-ordinate rehabilitation of the cotton sector.

National cotton production reached a peak of 38,000 metric tonnes of seed cotton in 1984/1985. Production declined to 14,000 MT by 1995 following liberalization of the sector and withdrawal of Government from the provision of credit and inputs. The Cotton Development Authority estimates currently that there are 350,000 ha in the country suitable for cotton production, with a potential production of 50,000 tonnes annually. Until Government initiatives to encourage cotton growing began to take effect in 2006, national production stood at only 5,000 tonnes from 30,000 ha in 2005. 2008/09 production is estimated at 10,000 tonnes from 46,000ha (ICAC, 2008).

Yet before liberalization, cotton was once one of Kenya's main foreign exchange earners. Under structural adjustment policies, there has been a collapse of the vertically integrated system for input supply, extension and seed cotton buying. This combined with falling world prices has resulted in thousands of cotton growers abandoning the crop.

In Kenya, cotton is currently grown solely by small-scale farmers in Western, Nyanza, Central, Rift Valley, Eastern and Coast Provinces of Kenya. An estimated 200,000 farmers grow most of the cotton on holdings of less than one hectare. Cotton in the country is mainly grown in arid and semi arid areas where there are limited economic activities. Cotton yields in 2006 averaged 572 kg/ha of seed cotton or 191 kg/ha of lint, estimated as 23% of the potential yield (Global Development Solutions, LLCTM).

The Cotton amendment Bill of 2006 provided the legal framework for Government supported re-organization of the cotton sector. Already there has been some impact with national production rising to 9,800 tonnes in 2006 from 5,090 tonnes in 2005. However, this increase was mainly due to an increase in the number of producers (hectares under cultivation) rather than any substantial increase in productivity. Average yields remain at 400 – 600 kg/ha of seed cotton.

At present, the commodity chain is made up of unlicensed private traders and ginning companies buying cotton on an *ad-hoc* basis. The cotton production areas are spread across Western Central/Eastern Kenya and the Coast Province with some growers often a long way from a ginnery. They are, therefore often forced to sell to middlemen. There is no zoning or concession system, as operates in Mozambique. Some ginning companies distribute inputs to farmers on credit but others do not, providing the opportunity for 'side-selling'. A study by Ikiara & Ndirangu (2002) suggests that Kenyan cotton is chronically uncompetitive with examples of negative gross margins in 2001 from a yield of 572kg/ha. A study by Wakhungu & Wafula (2004) confirmed this: farmers in Mwea did not earn enough to offset the cost of chemicals. One farmer in Mwea spent KShs 8,000 to grow cotton in the 2003 season and after harvesting earned only KShs 2,000.

Some Ginneries e.g. Mwea Ginneries through the Mwea Promotion Project (MCP) Kitui Ginneries have provided credit in terms of inputs in order to encourage farmers to grow cotton and therefore ensure adequate cotton for their ginneries (Chresma, 2008).

Private sector initiatives are not always well regulated. It has been noted that some chemical companies may have taken advantage of the current initiative on cotton production

to sell products that are expensive and not necessarily effective against the major pests of cotton. In the case of Mwea Ginneries (MCP) one of the major concerns for the farmers was the phytotoxicity to cotton when Bifenthrin was applied for the control of mites (Christian Resource Management - Chresma, 2008).

CODA and the Extension Services (Ministry of Agriculture) have recognised the need and value of promoting ICM such as through demonstration plots but have so far lacked the capacity to implement such as strategy. One constraint has been appropriate and up-to-date technical packages for crop and pest management of cotton. In addition, the national agricultural research institutions are not always fully in touch with the requirements of the ginning sector, and poor extension services mean they have difficulty reaching large numbers of farmers with technical messages. Much more should be done to foster greater public/private partnership to address the needs of all stakeholders in the value chain.

There are also policy issues which impact on the already complex situation, such as price-setting for seed cotton, subsidies for inputs and access to input credit. Cotton farmers are very price sensitive but attempts to control the price can have a negative impact on the willingness of the private sector to invest in production support mechanisms.

What would the project do in Kenya?

The proposed project would provide support to the government cotton initiative by:

- 1 Working with KARI, CODA and key ginning companies in the Kenya Cotton Ginners Association (KCGA) to ensure sustainable input supply and technical support to cotton producers for improved crop management. (Component 3)
- 2 Develop appropriate ICM packages to complement Government support for inputs and train trainers (both government extension and private sector) to provide technical support. (Components 1 and 2)
- 3 Ensure that promoted ICM practices are sustainable, profitable and consistent. Consistency of message delivered to and by all stakeholders along the cotton value chain is critical. There is considerable scope for improving the efficiency and effectiveness of pesticide use. (Components 3 and 4)

Mozambique

During the years of conflict following independence, cotton production in Mozambique declined from 140,000 tonnes seed cotton in 1974 to a low of less than 20,000 tonnes in 1986. Since then it has steadily increased to reach 117,000 tonnes by 2000 and although production collapsed to below 40,000 tonnes in 2001/2002 due to problems with low world market price and loan defaulting, it was back to 110,000 tonnes in 2006. Estimated 2008/09 production is only 33,000 tonnes from 205,000ha (ICAC, 2008). There is therefore considerable potential to increase production to pre-independence levels by improving production efficiency in the traditional cotton areas of Nampula Province as well as supporting the expansion of cotton production now occurring in the Provinces of Tete and Cabo Delgado.

Cotton is mainly produced in northern Mozambique with the Provinces of Nampula and Cabo Delgado accounting for 63% of national output with a cultivated area of 80,000 ha.

While Nampula is the 'traditional' cotton belt with little expansion in output or in area under cultivation, the production area is increasing in Cabo Delgado.

There will always be differences between companies and between growing areas but the average lint yield in Mozambique among smallholders is below that of Mozambique's neighbours (at only 120 - 180 kg/ha) compared to 160 - 250 kg/ha in Tanzania and 300 kg/ha in Zambia. Seed cotton prices to producers are also among the lowest in Africa at US \$0.16, compared to US \$0.24 in Zambia and US \$0.27 in Tanzania (2003 data from IAM, Mozambique).

The Government of Mozambique (GoM) supports expansion of cotton production and improvement of cotton yields through the agency of the Cotton Institute of Mozambique (Instituto do Algodao de Mocambique, IAM). A concession system operates under which a ginning company is licensed to operate in a given area and smallholders are obliged to sell to the cotton company operating in their area. There has been criticism of some of the cotton companies for accepting a low input/low output production system and providing inadequate technical support to their growers.

One problem in Mozambique is that most cotton companies are failing to invest sufficiently in technical support to their contract farmers and they are adopting a policy of extensification, rather than intensification i.e. fulfil their ginning capacity by an increase in the number of farmers and in area cultivated, rather than by increasing productivity per unit area. This approach might meet the short term needs of the ginning companies but, combined with low farm-gate prices offered for seed cotton, it does not improve the livelihoods of cotton smallholders and they readily abandon cotton growing as soon as the opportunity arises, for example by switching to sesame growing in Nampula Province.

Due to poor management and inefficient use of inputs, returns from cotton are particularly poor in Mozambique, as can be seen from Table 1 below reproduced from Poulton *et al.* (2004).

Table 1. Seed cotton price and returns to labour in SSA countries 2000 – 2002

Country	2000	2001	2002
<i>Seed cotton price [US\$/kg]</i>			
Uganda	0.20	0.20	0.20
Tanzania	0.22	0.20	0.19
Ghana	0.10	0.20	0.19
Zambia	0.21	0.24	0.22
Mozambique	0.15	0.12	0.13
Zimbabwe	0.33	0.16	0.11
<i>Returns to labour [US\$/family labour-day]</i>			
Tanzania	0.98	0.67	0.94
Zimbabwe	2.17	0.94	0.40
Mozambique	0.31	0.29	0.32
Zambia	0.73	0.75	0.81

What the project could do in Mozambique

The proposed project would:

- 1 Work with the more progressive cotton companies that are willing to invest in the provision of technical support for improved crop management. (Component 3);
- 2 Expand upon the limited on-farm demonstration program initiated by Eduardo Mondlane University to promote ICM (Components 1 & 2);
3. Build upon existing initiatives to develop a sustainable ICM package and promote it as extensively through on-farm demonstrations (Components 1, 2 & 4).

Contrasts between Kenya and Mozambique

Kenya and Mozambique share the problem of low cotton yields due to poor crop management caused by inadequate technical support but there are also contrasts between these two countries with regard to their cotton production. The most significant of these contrasts is that the Government of Mozambique enforces a concession system that protects the ginning company from competition for seed cotton. One of the advantages of this system should be that it prevents side-selling and should encourage cotton companies to invest in provision of inputs, credit and technical support. In Kenya, it is a “free-for-all” system with cotton companies and small traders buying seed cotton anywhere they can find it. Such a competitive system should result in higher farm-gate prices but actually discourages cotton companies from investing in service provision (inputs, training etc) because the farmer can take the services offered but then sell his cotton to another company.

A comparison between the two countries is given in Table 2.

Table 2: A comparison of production, yields and prices in participating countries

INDICATORS	KENYA	MOZAMBIQUE
Production 06/07	28,586 MT	120,000 MT
Maximum production tonnes (year)	38,000 (1985)	140,000 (1974)
Average yields [seed cotton]	400 – 600 kg/ha	300 – 500 kg/ha
Average cotton holding	0.5 – 1 ha	0.5 – 1 ha
Household income (KARI data, 2006)	157 US\$	No figures
Average income/ha	US \$ 79.77/ha	No figures

Although cotton productivity (production/ha) is similar and size of holding is similar in both countries, the project will allow a comparison of the impact of technical support under the different policy environments operating in each country.

2. PROJECT DESCRIPTION

2.1 Project goal and purpose

The **project goal** is to: Reduce rural poverty, improve farmers' livelihood, and promote sustainable agriculture in cotton based cropping systems in Kenya and Mozambique.

The **project purpose** is “to improve cotton production efficiency through formulation and promotion of innovative ICM options in the cotton production systems in Kenya and Mozambique by involving private enterprises and public organizations”.

In some more detail, this entails

1. Empowering the farming community in on-farm decision making.
2. Enhancing skills of smallholders in quality cotton production.
3. Raising awareness of farmers about international sanitary and phytosanitary standards of production procedures of cotton.
4. Reducing health hazards to pesticide users and consumers through rationalizing use of pesticides by developing awareness, training and participatory trials.
5. Developing an holistic approach to cotton management and development by strengthening linkages among service providers and farming communities from pre-sowing to post-harvest management.

2.2 Project Participants and Beneficiaries

The participants and beneficiaries of the work will come from diverse stakeholder groups within each country. Major categories are as follows;-

Cotton producers
Farmer associations
Extension agents
Researchers and their institutions
Private sector- ginneries, input suppliers, transporters of cotton

Commodity bodies such as CODA
Exporters
Policy makers

However, the main beneficiaries of the project will be the rural households that depend on cotton for part or all of their income. The number of cotton growers in each of the implementing countries differs each year, depending largely on the relative price offered for seed cotton in the previous year. The approximate number is 250,000 households in Kenya and 300,000 in Mozambique. Assuming an average of 5 persons per household, the total number of direct beneficiaries from improved production efficiency would be around to 2.75 million. Major secondary beneficiaries are the cotton ginning companies, input supply companies and those involved in transporting the seed cotton and exporting ginned cotton lint. Both countries also wish to stimulate their textile industries and that would further widen the benefits.

A target of 240 farmer field schools and demonstration plots is planned, 120 each in Kenya and Mozambique, involving approximately 6000 farmers directly. Many more farmers will be reached indirectly, through field days, the media and other dissemination activities.

2.3 Expected Benefits and Impacts

Cotton is critical for improving household incomes and facilitating the emergence of viable commercial smallholder agriculture in SSA (Broughton et al., 2002). The Kenya Government has identified cotton production as an enterprise with the potential to decrease poverty and is supporting campaigns to increase the number of growers. To address this problem, the project intends to realize the following benefits and impacts:

a. Higher yields and more profitable cotton production where farmers implement the project's ICM systems.

Average yield on the farms where the project is implemented will increase, with yields in demonstration blocks (farmer managed) increasing to at least 50% if that seen in the best variety field trials in specific zones in each country. It is anticipated that there will be an increase of net income of participating farmers from cotton of at least 30% and this will be realised both from improved production and a reduction in pesticide use (50%).

b. Improved vertical value chain linkages between farmers, private and public sectors.

Numerical targets are difficult to set for this outcome but we would expect to see the private sector making a greater commitment to the provision of input and technical support to farmers; the farmers becoming better organized and empowered in their bargaining position vis a vis the private sector; and the public sector being better able to support both farmers and ginneries.

Other further benefits will include:

Institutional Strengthening: There will be improved linkages between scientists in the

national systems in the participating countries.

Poverty Alleviation: The cotton sector already makes a major contribution to the national economy and to many more livelihoods beyond just the producers.

Foreign Exchange Earnings: Improved farmer earnings through reduced input costs and increased production are also expected to have a positive impact on the foreign exchange earnings.

Compliance with CFC and ICAC goals: In terms of CFC priorities as indicated by the objectives outlined in the Third Five year plan (2008-12) this project directly addresses the need to improve reliability of supply (Objective 1) The project will allow an opportunity for the involvement of multinational and national companies (Objective 9) and highlight the importance of commodities in the economic development and concerns of commodity producers (Objective 10).

The project also addresses key areas of the ICAC Strategic Plan which identifies sustainable production systems as one of its strategic areas (see Section 2.7). It notes that in most cases the necessary technologies already exist, but because farmers lack knowledge and access to inputs, implementation is constrained. It is these constraints that the project seeks to address.

2.4 Project components and activities

This project approach differs from previous attempts to address low cotton productivity in the following main respects:

1. There is a focus on empowering the farming community in on-farm decision making.
2. The project aims to integrate the efforts of public and private sector stakeholders in the provision of support to producers.
3. The project will target the value chain as a whole, rather than focusing on single components such as pest management.
4. The project considers environment and ecology as well as human health.

The proposed approach is based on farmer participatory training and research (FPTR) through farmer field schools. This is an innovative, participatory and interactive learning approach. The aim of the FPTR is to build the farmers' capacity to analyze their cotton production systems, to identify their main constraints, and to test possible solutions, eventually identifying and adopting the practices most suitable to their cropping system. The knowledge acquired during the learning process can be used to build on existing knowledge enabling farmers to adapt their existing technologies so that they become more productive, more profitable and more responsive to changing conditions or to adopt new technologies. As compared to the conventional top down hierarchal approach, FPTR gives more firsthand knowledge to the farmers in all aspects of cotton management. In the context of cotton and FPTR, integrated crop management (ICM) is defined as

- *Increasing farmers' profitability from cotton growing by using best practices for production of cotton including cotton variety selection and seed health, agronomic and tillage practices, soil health and fertility management, integrated pest management, harvest and post harvest management.*
- *Developing farmers' skills and knowledge to understand economic fundamentals of farm management.*

- *Sensitising farmers to the impacts of farming on the environment (especially agricultural ecology) and avoidance of health hazards of different farming operations.”*

2.4.1 Project areas

Kenya

In Kenya, the project will be undertaken in the low rainfall cotton growing areas in arid and semi-arid lands (ASAL) east of the Rift Valley where CODA and KARI have initiated contacts with cotton farmers’ associations and ginneries. This includes Makueni, Kitui, Mwingi, Machakos, Mbeere, Tharaka and Meru North districts in Eastern Province; Lamu, Taita Taveta, Malindi and Tana River in Coast Province; and Baringo in the Rift Valley Province (Figure 1).

In Kenya, cotton is largely produced under rain-fed conditions by individual growers on landholdings of approximately one hectare, but the number of farmers in each district varies from season to season. The number of farmers in the target districts varies from season to season. A summary of the area covered by cotton and the estimated potential in the respective target districts is presented in Table 3.

Table 3. Total area under cotton production and the estimated potential in target project sites in Kenya in 2007/08 (CODA, 2007).

S/No	Province	Area (Ha)			Estimated Potential (Ha)
		Target 2007	Achieved 2007	Projection 2008	
Eastern					
1	Meru North	2396	1274	1500	10000
2	Tharaka	2500	1890	2000	
3	Mbeere	1520	1240	1500	8000
4	Mwingi	2490	1668	1800	7000
5	Kitui	3720	2590	2800	12000
6	Machakos	1862	1945	2000	10000
7	Makueni	9778	5938	6000	40,000
Coast					
8	Lamu	2741	3230	4800	10000
9	Taita/Taveta	2820	840	1000	
10	Tana River	725	556	800	6000
11	Malindi	700	207	300	5000
Rift Valley					
12	Baringo	1500	448	800	

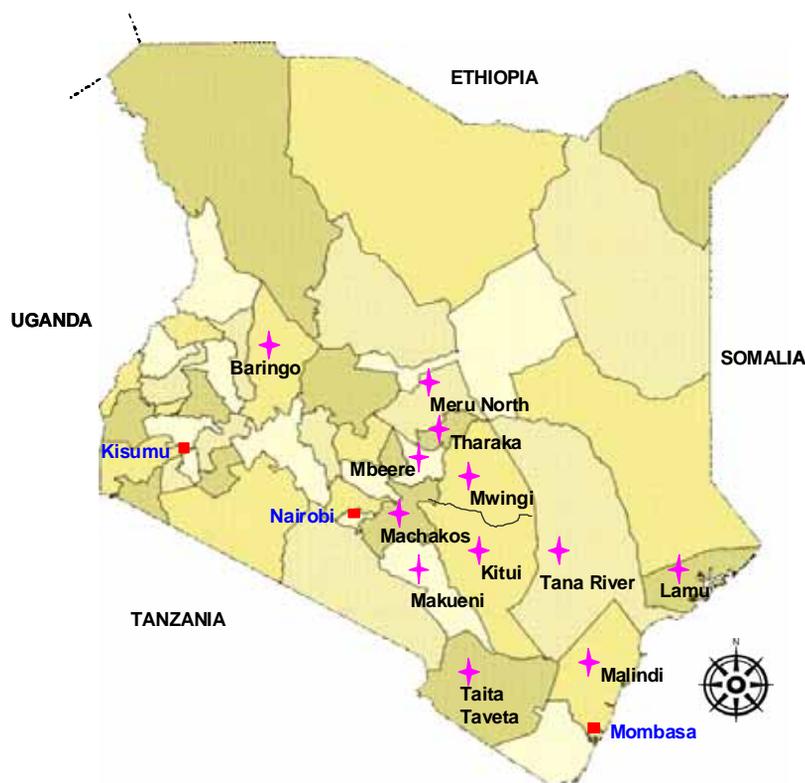


Figure 1. Map of Kenya showing the target cotton growing Districts (Adapted from http://mapsof.net/uploads/static-maps/kenya_districts_coloured.png)

Mozambique

In Mozambique, the project will work with farmers and progressive and stagnant cotton companies in Sofala and Nampula Provinces, respectively. This will permit assessment of the differences in impact or the role of the companies in the development of ICM strategies. These companies include CAN (progressive), which operates in Maringue, Chemba and Caia districts, and SANAM (stagnant) that work with farmers in Monapo, Mecuburi and Meconta districts (Figure 2).

A summary of the total area under cotton production 2003/04 and 2004/05 in the target districts in Sofala and Nampula Provinces is presented in Table 4.

Table 4. Total area under cotton production in target project sites in Mozambique in 2003/04 and 2004/05 (IAM, 2006).

S/No	District	Area (Ha)	
		2003/04	2004/05
Sofala Province			
1	Maringue	6,839	7,694
2	Chemba	3,646	4,038
3	Caia	2,865	2,881
Nampula Province			
4	Monapo	38,923	22,292
5	Mecubúri	12,654	10,513
6	Meconta	4,857	3,252

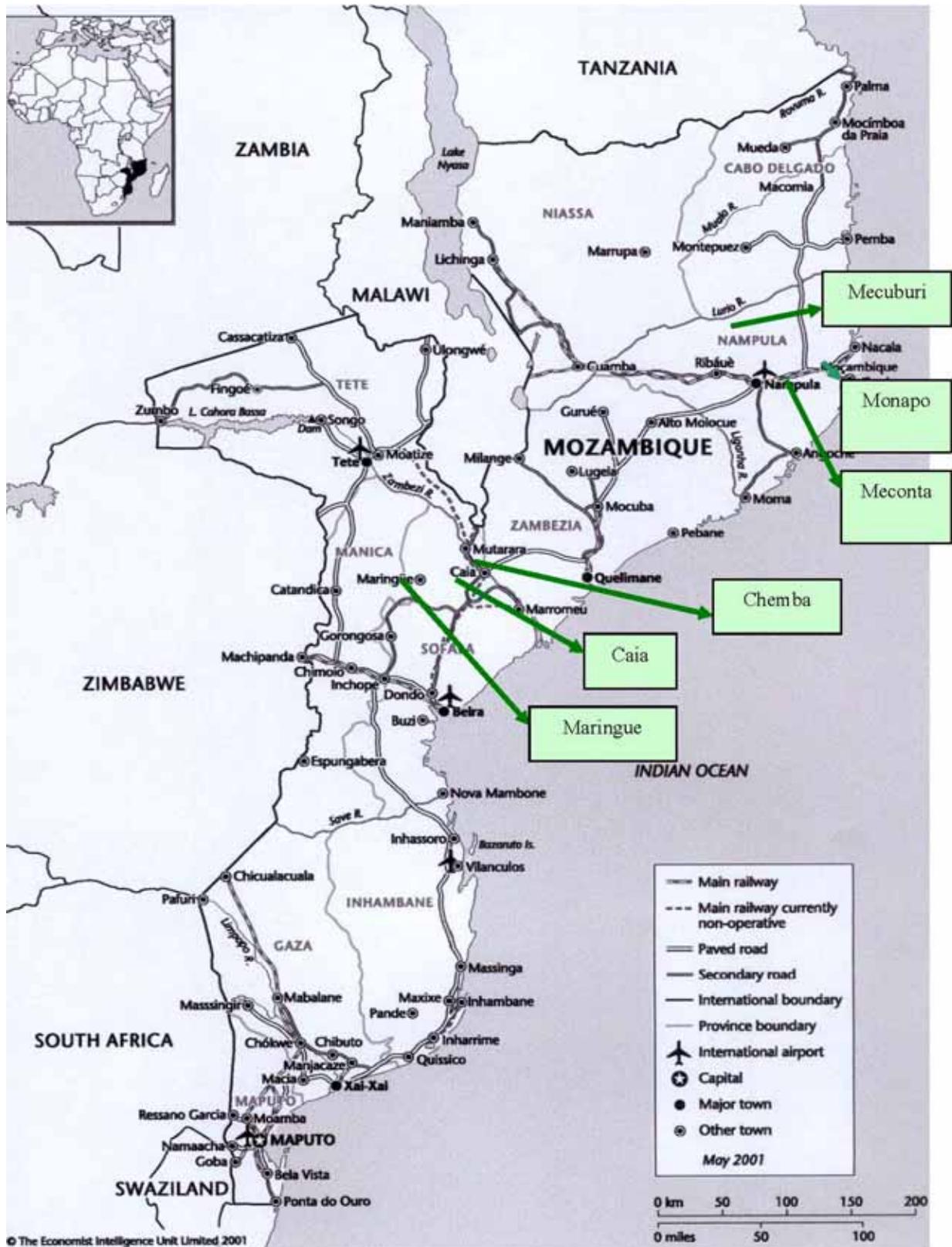


Figure 2. Map of Mozambique showing the target cotton growing Districts (Adapted from Mozambique sub-sector cotton study, October 2001)

2.4.2 Project activities

Component 1: Introduction of best practice ICM packages

The project will improve, standardize and implement an innovative ICM package based on a Farmer Participatory Training and Research approach for adoption by cotton farmers. ICM is a holistic systems approach to increase the profitability of agricultural production that incorporates appropriate technologies and best agricultural practices e.g. use of crop rotations, appropriate cultivation techniques, careful choice of seed varieties and minimum reliance on artificial inputs such as fertilisers and pesticides, better management of on-farm resources, and environmental conservation. Current packages and recommendations are summarised in Tables 5 and 6.

Table 5. Recommended ICM for cotton growers in Kenya (summarised from Kambo *et al.*, 2008).

Activity	When/how to be undertaken
Variety and Seed selection	<p>UKA 59/240 – recommended for South Nyanza, parts of Kisumu bordering South Nyanza, central Kenya, Eastern Kenya and Coastal strips</p> <p>BPA 75 – recommended for Busia, Bungoma Siaya, parts of Kisumu, Kakamega, Kerio valley, West Pokot, Baringo, Tana and Bura Irrigation schemes.</p> <p>2 new varieties developed at KARI Kibos and Mwea research centres:</p> <p>i) KSA-81M (KARI Kibos) – recommended for Nyanza, and Rift Valley provinces</p> <ul style="list-style-type: none"> • early maturing (4.83months) • selected from UKA59/240 • out yields parent plant by 11% in terms of yield • yields 2000Kg/ha of seed cotton • gives 30-33% lint • good fibre quality (same as UKA 59/240) • good fibre strength (>80000 pounds/square inch) • medium fibre fineness • high elongation percentage (11% while that of KSA 81M is 9-10%) • can be intercropped with beans and cowpeas without affecting yield of either crop • resistant to most cotton diseases (but not to pests) <p>ii) HART 89M (KARI Mwea) – recommended for Eastern, Central and Coast Provinces</p> <ul style="list-style-type: none"> • Multi-line cultivar selected from lines L142.9 and L 433.15 • Semi-determinate growth habit • Round sharp, pointed bolls of medium size • High degree of tolerance and no lodging under rainfed conditions • High level of resistance to bacterial blight and jassids

	<ul style="list-style-type: none"> • Out-yields all other cultivars in Eastern and Coast Provinces • Mean yield potential 2000Kg/ha • 40% ginning percentage compared to 34% for UKA 59/240 <p>Obtain seed from KARI or nearest ginneries. Farmer must obtain seeds well in advance</p> <p>The seed is dressed with copper fungicide to control bacterial blight disease</p> <p>Farmer are advised to procure seed well in advance of the growing season from the nearest ginnery</p>
Land preparation and planting	<p>Plough and harrow (where necessary) the land 1 month before planting to avoid late planting. Late planted cotton that has a considerable reduced yield (e.g. 4 weeks delay means 40% reduction). This is because the later heavy rains will affect flowering and the incidences of pests increases later in the season.</p> <p>Plant in February and March in Western, Nyanza and Coast Provinces.</p> <p>Plant in October in Central and Eastern Provinces.</p> <p>Plant spacing: 100 x 30 cm in central and Eastern Province; 90 x 30 cm in Coast, Western and Nyanza Province; 100 x 30 cm in rift valley and Kerio valley.</p> <p>Seed rate: 17.5Kg/ha; 5-6 seeds per planting hole at a depth of 3-5 cm</p> <p>Water requirements during the first 2 months of growth are low but demand increases at flowering.</p>
Fertiliser	Apply triple Super Phosphate (TSP) at planting and top dress with either Calcium Ammonium nitrate (CAN) or Simple ammonia (SA) when flower buds start to appear. The rate of application is based on results of soil analyses. Manure application also recommended.
Weeding	Keep fields weed-free. Weeding starts immediately after germination because cotton is slow growing in its early stages and weeds can adversely affect it in that period
Thinning and gapping	Thin out plants leaving 1 (in Central and Eastern Provinces) or 2 (in Nyanza, Western, Rift valley and Coastal Provinces) strongest plant(s) per planting hole, when 10cm high but not later than 4 weeks after germination.
	Gapping is done at the same time.
Spraying	When cotton is planted during the long rains spraying should start during flowering, 9-10 weeks after germination.
	In areas of light rainfall cotton may be planted at the beginning of the short rains. It will survive the dry period and then start to flourish in the long rains. At this point spraying should commence.
	Spraying is done selectively according to the pest population using

	<p>pesticides suitable for control the particular pest.</p> <p>Spraying is done 3 times at 2 weeks intervals with the number of sprays varying from 3-5. Additional sprays done only in case of visible serious pest infestation.</p> <p>Recommended pesticides include: synthetic pyrethroids and acaricides.</p> <p>Use knapsacks and Ultra Low Volume spray systems.</p>
Rotation	Cotton planting should be preceded by dolichos or other legumes
Intercropping	<p>KSA-81M can be intercropped with cowpeas or beans without affecting the yield of either crop.</p> <p>For maize intercrops, the maize is planted first and after weeding, cotton is planted.</p>
Harvesting	<p>The harvesting period should coincide with the dry months of the season.</p> <p>Commences when the first bolls open, about 4-5 months after planting.</p> <p>If it rains, cotton should be left on the plants before picking commences.</p> <p>Use two baskets, one of clean seed cotton (Grade A) and one for stained seed cotton (Grade B).</p> <p>Cotton picking should be done weekly once harvesting commences.</p>
Destruction of residue	<p>All cotton plants and residue should be uprooted and destroyed by burning after harvesting i.e. “closed season”.</p> <p>Early uprooting and burning gives a longer closed season and reduces pests problem.</p>
Storage	Keep cotton in clean gunny bags in a dry, cool place
Marketing	The liberalisation of the cotton industry has enabled farmers to sell their produce to private ginneries in the respective cotton growing areas at competitive price.

Table 6. Recommend ICM for cotton growers in Mozambique (summarised from Mahalambe, 2002 and Mahalambe *et al.*, 2007).

Activity	When undertaken
Land preparation	<p>October - November</p> <p>Zero tillage is currently under consideration.</p>
Planting:	<p>December 1 – 31</p> <p>So far there is a wide variation among the farmers.</p> <p>Some farmers sow treated seeds while others use non-treated seeds. The treated seeds are coated with systemic insecticides, mainly against cotton jassid.</p>
Thinning	January 10 - 30

Weeding	<p>1st weeding: January 10 - February 10.</p> <p>2nd weeding: March 15 - March 30.</p> <p>3rd weeding: This is facultative.</p>
Spraying	<p>1st foliar spray: February 15 - March 01 Against early season sucking pests, including jassids, aphids, whitefly, spider mites and trips.</p> <p>2nd foliar spray: March 01 - March 15 Against early season sucking pests, including jassids, aphids, whitefly, spider mites and thrips).</p> <p>3rd foliar spray: March 15 - 30 Against middle season chewing pests, including American, spine and red bollworms;</p> <p>If sucking pests such as jassids, aphids, whitefly, spider mites and thrips persist, then another spray application is done.</p> <p>4th foliar spray: April 01 - 30 Against middle season chewing pests, including American, spine and red bollworms.</p> <p>5th foliar spray: April 01 Against middle to late season chewing pests, including American, spine, red and pink bollworms).</p> <p>6th foliar spray: Facultative Targets late season chewing pests such as red and pink bollworms as well as possible sucking pests such as cotton stainer and resurgences of aphids, for this a binary pesticide is also applied.</p>
Harvesting	<p>Commences from late May 15 to July 30.</p> <p>The harvesting period is very long due to tow reasons:</p> <p>i) the ball opening is not uniform while moving from cost to inland, with the late areas having early bolls opening as compared to the cost</p> <p>ii) Even when bolls are opened, farmers have labour shortage, prioritising harvesting of food thus harvesting cotton later.</p>
Closing season	<p>July 30 to 30 August.</p> <p>Cutting and burning the crops residues after harvesting</p>

Existing ICM methods will be reviewed at the start of the project. We start from the premise that yields can be substantially improved using existing knowledge and technologies, but there are various possible reasons why farmers don't use currently available ICM methods that would improve their yields. These include a lack of understanding and access to the necessary knowledge and technologies. The ICM methods may also be formulated in ways that are inappropriate for some farmers. Farmers and other stakeholders will be interviewed through Focus Group Discussions (FGD) and Key Informant Interviews (KII to identify the key constraints related to cotton production and marketing, analyzing issues along the whole cotton value chain ranging from pre-sowing to post-harvest. Farmers' existing agricultural practices, production patterns and post harvest handling will be reviewed

to identify gaps in understanding. Training materials with the appropriate ICM technologies will be developed, prioritized and collated for Training of Trainers courses (ToTs) for government extension staff of both Kenya and Mozambique. Another output of this component is the compilation of promotional materials (manuals, brochures and fact sheets). The training materials will also draw from CABI's previous experience in South Asia and East Africa.

The topics for cotton which will form the basis for the ToT curricula development are formulated in modules (see Table 7), which provide the basis for participatory discussions among cotton experts, government extension staff, input providers and other stakeholders. These modules are based on CABI's long experience with cotton and FPTR and cover all the key decisions for farmers from pre-sowing through to post harvest management. At pre-sowing issues of seed/variety selection and seed quality are particularly important, so the FFS will include training on principles of quality seed production, and discovery learning exercises for measuring seed viability and fibre quality, including fibre strength and length.

Table 7. Modules for Curricula Development of Training of Trainer Courses

MODULES	TOPICS
Module-1 Pre-sowing	<ul style="list-style-type: none"> • Selection of variety / seed source and availability • Qualities of good seed/variety • Seed germination test. • Land and seedbed preparation methodologies • Discussion on agronomic practices • Cotton sowing techniques with regard to water conservation.
Module-2 Sowing and Crop stand	<ul style="list-style-type: none"> • Seed bed preparation. • Seed sowing methodologies (Participatory Trials) • Germination percentage • Determination of plant population/plant density • Soil sampling for soil ecosystem analysis. • Participatory trial on crop nutrition and nutrient management
Module-3 Crop production and protection	<ul style="list-style-type: none"> • GAP Standards in cotton production • Cotton Agroecosystem Analysis (AESA) • Introduction to Cotton pests • Role of sucking, defoliators and borers insect in cotton production • Predation on sucking insects. • Defoliation trials. (Crop Damage compensation assessment Trials) • Participatory trials on conservation of natural enemies using the indigenous resources. • Chemical poisons (Insecticide, weedicide and Fungicides) and their safe use. • Impact on environment and human health
Module-4 Crop production and protection	<ul style="list-style-type: none"> • Sanitary and Phytosanitary (SPS) standards • Integrated Disease management in cotton • Role of temperature and humidity in disease outbreak. • Cotton crop physiology and crop health indicators • Field cage experiment for mealy bug and predators. • Food web and its philosophy. • Defoliation trials. (Crop Damage & compensation assessment Trials) • Participatory trials on conservation of mealy bug destroyers

	<ul style="list-style-type: none"> using the indigenous resources. Understanding the alternate host status of insect pests and associated predators. (study on monitoring of alternate host plants) Understanding natural boll shedding vs insect pest damage.
Module-5 Crop production and protection	<ul style="list-style-type: none"> Impact of pesticide on natural enemies and other beneficials. Participatory trials on mealy bug destroyer host range evaluation Understanding the boll with hole for Spotted boll worms Participatory trial on the effect of fertilizer on the pest (mealy bug) and predator relationship. Measuring the natural mortality of eggs of cotton bollworms Evaluating the damage by Pink bollworm. Evaluating predatory mites
Module-6 Harvesting	<ul style="list-style-type: none"> Harvesting Indicators Proper harvesting methodologies Collection of yield data and its analysis. Cost benefit analysis
Module-7 Post-harvesting management	<ul style="list-style-type: none"> Cotton storage techniques Packing and transportation techniques Trade implications and requirements Fair Trade options for LDC

Activity 1.1: Participatory analysis of needs and constraints of farmers and markets will be undertaken. The detailed planning of this work will be undertaken at the inception workshop, including identifying areas to be surveyed and methodologies to be used.

Output: Reports outlining the farmers needs and constraints will be produced electronically and disseminated among stakeholders and experts

Activity 1.2: An analysis of farmers' existing agricultural practices, production patterns, post harvest handling will also be conducted

Output: Reports outlining the current situation will be produced and awareness of these will be disseminated among stakeholders and experts

Activity 1.3: From the above, and in consultation with experts, appropriate ICM models and Training of Trainers curricula will be formulated

Output: Curricula and awareness among stakeholders

Activity 1.4 Ginneries will be supported by the production of quality manuals and promotional materials on best ICM cotton strategies

Output: Training manuals and promotional material will be produced

Component 2: Promotion and adoption of ICM packages

This will be undertaken through ToTs, establishment of field demonstration plots, Farmer Field Schools (FFS), production and dissemination of high impact training and field days. The training programme will cover technical content to fill knowledge gaps and discovery learning approaches that will be used to build the capacity of farmers. Individuals who will act as farmer trainers (facilitators) and participate in the ToTs will be selected from local extensionists, input suppliers and ginneries. A series of training workshops will be held to build a cadre of individuals that are able to work effectively with farmers. After the ToTs, the identified ICM technologies will be introduced to demonstration plots and FFS in the cotton

growing regions in each country. Where possible, the demonstration plots will be managed by the FFS farmers, with facilitation from the trained trainers. The FFS demonstration plots will be used for field days to be conducted in each target district, to which farmers and other stakeholders will be invited.

A total of 240 Farmer Field Schools (FFS) will be established in Kenya and Mozambique, 120 in each country. The approach used for this is to hold one Training of Trainers course for 25 facilitators from government extension services in each country in year 1 and year 2, respectively. The first batch of facilitators runs at least 20 schools (allowing for some drop outs).

In the second year, another 25 facilitators will be trained, so in year two 40 schools will be set up (the ones established in the first year no longer need the facilitator). The trained facilitators will run another 40 FFS in the third year and another 20 in last year. For quality assurance, the expert trainers will conduct backstopping visits two times during year 1 and 2 and three times during year 3 and 4. In addition, 4 stakeholder workshops (one per year) will be conducted to involve input supplier group (Fertilizer, pesticides, seed etc) and ensure clean cotton harvesting, buying and transportation.

As indicated in Table 7, seed quality and selection issues are important topics to be covered in the FFS. Seeds for use in the demonstration plots will be made available as follows.

Kenya

In Kenya, the Cotton Development Authority (CODA) provides seed for free to farmers after paying the ginneries for delinting, packaging and transport to various depots in the cotton growing areas. The quality of seed being used is high as the cotton crop grown for seed is inspected by Kenya Plant Health Inspectorate Services (KEPHIS) with the Kenya Agricultural Research Institute (KARI) providing technical services on the best crop husbandry practices. CODA on the other hand, purchases the seeds for farmers thus ensuring that the source of the planting seed can be traced back through the ginnery to the actual farm.

For the proposed project, farmers will obtain cotton seed that is delinted and treated with Moncern GT 390Fs (containing Imidacloprid + 50g/l Pencycuron + 107 g/l of Thiram) packed in 4kg packages (sufficient for 1 acre). A new seed system, where new seed is released to farmers after every three years from breeders seed through to foundation seed is being developed. KARI will provide sufficient seed for the demonstration plots from their already established seed multiplication plots located at Giaki in Meru, Ithokwe in Kitui and Mwea. Plans are underway to have additional seed multiplication sites at Hola, Bura, Kerio Valley Development Authority Irrigation farms and at Mpeketoni in Lamu, KARI-Msabaha and KARI-Mtwapa by 2009/2010 short rain season and 2010 long rain season.

There is an active breeding programme in existence in Kenya led by the KARI research stations in Mwea and Kibos where new varieties (e.g. VERED, F962, A540 and NY(72)26) are being tested for performance including yield, outturn, fibre qualities, resistance to pests and drought tolerance. KARI is also involved in a breeding programme initiated by Monsanto, and CODA has established strategic linkages with cotton breeding programmes in China and India. Any potential varieties of cotton derived from these programmes will be channelled to the farmers through the demonstration plots to be established in the target areas.

Mozambique

In Mozambique, the situation is different as cotton production is based on a zoning (concession) system. The private company granted a certain territory promotes cotton by supplying seed for planting, inputs on credit, technical extension service for free, and procures all the cotton produced from the designated area. In other words, the farmers get seeds free of charge, from the cotton company that promotes cotton in their respective areas. This is a legal obligation for companies that are signatories to the concession contracts. At present, the farmers receive guaranteed seeds. This is not certified seed, but is seed produced under contractual arrangements, where the companies select an area where they contract farmers who multiply the seeds. Some of the seeds supplied to the farmers are coated with systemic insecticides against early season pests e.g. jassid and aphids.

In the current proposal, the seeds for the demonstration plots will be supplied under a newly established three-year cycle seed system being developed by IAM. In this case, all seeds of newly developed varieties of cotton are multiplied by research centres, delinted and treated before distribution to farmers. IAM has already (in 2008) installed a mini ginner and a seed cleaning, grading and coating line. IAM is leading research on varieties at a special centre "*Centro de investigação e multiplicação de sementes de Namialo - Cimsan*", based in Nampula, where several new lines are being evaluated awaiting final selection and release. In addition, new varieties brought by a partnership between IAM and CIRAD - France are under final selection. These new varieties will directly feed to the new seed system and will be introduced to the farmers through the demonstration plots.

Activity 2.1 Individuals will be identified who will act as trainers (facilitators) for the FFS demonstrations plots.

Output: Lists with trainer candidates will be produced

Activity 2.2 Following the selection of trainers, workshops for training of trainers (ToT) will be conducted

Output: Workshop reports, training curricula

Activity 2.3 A selection of demonstration sites from existing FFS will be made

Output: List of locations for establishment of FFS and demonstrations

Activity 2.4 Following selection of sites, the on-farm demonstrations plots within selected FFS will be established.

Output: Demonstration plots established

Activity 2.5 At selected demonstration sites farmer-participatory agro-ecosystem analysis (AESAs) will be conducted.

Output: AESAs conducted

Activity 2.6 Trainers will be selected for their knowledge of cotton management and for other skills, but they will require mentoring and backstopping while they train farmers.

Output: Quality control for training put in place, trainers mentored

Activity 2.7 The demonstrated ICM package for cotton will be disseminated through farmer field days and through mass media

Output: Field days, media broadcasts, reports and scripts

Component 3: Building stakeholder linkages for sustaining ICM

An analysis will be conducted in both countries to evaluate existing and potential systems for delivery of inputs and technical support. The aim here will be to identify how current systems can be improved, particularly through vertical integration, drawing mainly from existing knowledge and studies. Consensus will be developed on 1 or 2 pilot schemes to be tested during the project. A series of stakeholder workshops will be held to bring relevant stakeholders together from along the value chain to negotiate ways in which they might support improvements in functioning of the chain, to design the pilots, and to monitor and evaluate their outcome.

An important consideration in a project such as this, with a number of stakeholders, is that balance is achieved between the interests and objectives of the different parties. This will be achieved in several ways.

- Stakeholder workshops will be facilitated by experienced facilitators with skills in managing multi-stakeholder processes. This includes ensuring that all stakeholders have a chance to express their views, and that decisions are made wherever possible by consensus.
- In multi-stakeholder processes it is recognized that there may be power inequalities between the actor groups. Some groups can be more powerful than others because of their size, their access to resources, their knowledge, their political or social status, their gender or age. Facilitation of multi-stakeholder processes takes account of these differences, and where necessary introduces checks or support to ensure those with more power do not dominate, and those with less are empowered to participate and contribute to decision making.
- Value chain actors will be reminded that cooperation and collaboration is to the benefit of all parts of the value chain. Although different actors may have different objectives, if one part of the chain is achieving its objectives at the expense of another, the chain is unsustainable and all lose out. Thus the value chain or system perspective will be promoted so that benefits do not have a skewed distribution.
- The Farmer Field School approach has been shown to empower members in various ways. By working together on a demonstration plot, collective action builds confidence and capacity, and so ability to participate and negotiate.
- Small group meetings with representatives of individual groups can help the group discuss its aims and objectives, so that they are appropriately prepared for interaction with other groups at larger meetings.

The different situations in the two countries provide opportunities for cross-learning. The main stakeholders include farmer associations, ginneries, private sector input providers, regulators, extension and commodity development bodies. In the workshops they will together design and implement pilot schemes for specific areas, which will be evaluated for lesson-learning. Background information will be collected on the policies, rules and regulations that govern cotton and production marketing in each country. Key players in the value chain will be identified and key informant interviews used to provide a broad understanding of how the value chain functions. This information will be used to plan a stakeholder workshop to validate the value chain map, increase understanding of how it functions, and identify bottlenecks that might inhibit the way in which new knowledge on

ICM can be used by farmers. During the workshop, recommendations for up- and out-scaling the effective approaches will be made, including at policy level. Options considered will include different types of contracting/credit arrangements between producers and ginneries (linked to input supply), concession systems and methods to improve information flow between stakeholders including research. Pilot schemes will be planned to test new ways of delivering inputs and technical support that will facilitate uptake of the new knowledge introduced in components 1 and 2. Smaller follow-up meetings with smaller groups of stakeholders to be involved in the pilot schemes will be held to concretise work-plans.

Activity 3.1 Stakeholder mapping of value chain and understanding of policy and institutional context.

Output: Workshop plan and background documents

Activity 3.2 Representatives from the key stakeholder groups will be brought together in the stakeholder workshop. Stakeholder roles and incentives and the policies and institutions (rules and regulations) that govern the functioning of the chain will be considered. Pilot schemes will be planned to test new ways of delivering inputs and technical support (outputs from Components 1 and 2)

Output: Outline and work-plan of pilot schemes to be tested.

Activity 3.3 Pilot schemes will be implemented and monitored. A key part of the monitoring will be use of standard stakeholder records of activities involving loans and repayments, transactions regarding inputs and deliveries etc. Regular meetings between stakeholder groups involved in the schemes will allow formal monitoring of progress and an iterative process in which lessons learnt or problems encountered are recorded and addressed.

Output: Validated schemes in place. Formal input-output records and reports of monitoring visits used to monitor progress.

Activity 3.4 A final workshop will allow country teams to share lessons learnt from national pilot schemes and evaluate how the different policy and institutional context in each country influenced the feasibility of schemes.

Output: Workshop report including lessons learnt.

Component 4: Impact assessment of ICM adoption made.

At the start of the project, a baseline survey will be conducted through Focus Group Discussions (FGD) and Key Informant Interviews (KII), using questionnaires and checklists, to establish the pre-adoption socio-economic situation and production practices in the project areas. The information generated will describe the production systems of the participating areas, their yields, inputs, costs and constraints, and what farmers feel needs to be improved within these systems. Initial farmer perceptions of ICM technologies, their socio-economic situation and resource endowment will be evaluated. Farmer criteria for evaluation of ICM technologies will be developed using participatory approaches and subsequently used to evaluate the packages being promoted. An impact assessment or *post adoption socio-*

economic survey will be conducted to compare adopting vs. non-adopting farmers of the ICM package. In the context of this survey, a ‘before and after’ analysis will be carried out, and a comparison made between “adopters” and “non-adopters”, to measure impact of the technologies and their contribution to farmers’ income and livelihoods. The results will be disseminated widely.

Activity 4.1 A baseline survey will be conducted of farmers’ current management practices and their perceptions of ICM, their knowledge gaps (links with 1.1- 1.3)

Output: Baseline survey data and assessment of skills and knowledge gaps identified.

Activity 4.2 In the last six months of the project, further community based surveys will be undertaken in order to conduct an impact assessment (before and after analysis)

Output: An Impact Assessment Report will be produced

Activity 4.3 Findings from before and after surveys analysed to include comparisons of adopting vs non adopting farmers

Output: Impact assessment report written

Activity 4.4 Report disseminated through websites, at workshops and via reports

Output: Awareness of project impact demonstrated

Component 5: Project management and coordination.

Administrative and accounting procedures will be established and local partners provided with relevant financial and administrative training following CFC procedures. A project inception meeting will be conducted to clarify project objectives and activities, develop detailed work plans and budgets, and establish lines of communication and pathways for dissemination of project outputs. A monitoring and evaluation plan will also be developed with stakeholders and implemented.

Annual planning and review meetings involving representatives from ICAC, PEA, and implementing agencies and collaborating agencies will be conducted (Project Coordination Committee). In the meetings, progress will be evaluated against work plans and the logical framework, using the quantitative and qualitative indicators contained therein. Work-plans for the subsequent years will be approved. A national midterm evaluation workshop of the project will be undertaken to improve project delivery and an independent terminal evaluation of the project will be undertaken.

The project will be managed and implemented according to the following interlinked principles, with a clear exit strategy:

Participation: Development interventions of this nature are only sustainable if the beneficiaries and appropriate stakeholders are actively involved in the design, implementation and evaluation of activities. Participatory approaches will therefore be

applied at all stages.

Sustainability: The intervention must be implemented in ways that ensure the outcomes are sustained after the life of the project. Capacity strengthening of primary and secondary farmer institutions is key to sustainability, as well as participation of the relevant policy making bodies.

Market orientation: Farming must be viewed as a market oriented enterprise if those engaged in it are to move out of poverty. Business development services such as credit must be promoted in this context.

Capacity enhancement: All stakeholders have some capacity, but may lack specific capacity critical to achieving the project objectives. The project will identify and build this capacity, in individuals, institutions and organisations.

Activity 5.1 Support the organisation and implementation of an inception workshop and support the establishment of CFC administrative and accounting procedures and train local counterparts in project procedures.

Output: Procedure manuals and guidelines; reports from the inception workshop; staff trained

Activity 5.2 Advise on operational procedures and initiate consultancies where necessary

Output: Operational procedures improved and translated as improved work flow. Consultancy contracts prepared and supervised.

Activity 5.3 Assist PIAs and ICAC to prepare necessary documentation, including budgets and work plans.

Output: Budgets, work plans produced

Activity 5.4 Liaise between project donors and implementers and arrange exchange visits

Output: Visits organise

Activity 5.5 Monitor project progress and report on inputs (disbursements), activities undertaken and outputs achieved (to include mid-term impact review and expenditure audits).

Output: Reports, management information provided

Activity 5.6 Assist PIAs and collaborators with planning and co-ordination of activities aimed at providing uptake pathways for outputs

Output: Work plans planned and implemented as per schedules

Activity 5.7 Prepare regular progress reports, mid-term evaluation reports, annual accounts, audits and project completion report.

Output: Reports, data & information provided

Additional information on project management is given in Section 4.

2.5 Work Plan and Gantt Chart

COMPONENT	Activity	YR1				YR2				YR3				YR4			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<i>1. Best practice ICM packages formulated</i>	1.1 Participatory analysis of needs and constraints of farmers and markets																
	1.2 Analysis of farmers' existing agricultural practices, production patterns, post harvest handling																
	1.3 Desk study to review and collate current crop production and protection recommendations and practices																
	1.4 Formulate appropriate ICM models																
<i>2. Adoption of ICM packages promoted</i>	2.1 Identify individuals that will act as trainers (facilitators) for the FFS demonstrations plots																
	2.2 Conduct training of trainers (ToT) workshops																
	2.3 Selection of demonstration sites from existing FFS																
	2.4 Establishment of on-farm demonstrations plots within selected FFS																
	2.5 Conduct farmer-participatory agro-ecosystem analysis (AESA) at selected demonstration sites																
	2.6 Mentor and backstop trainers as they train farmers																
	2.7 Dissemination of best ICM strategy through farmer field days and mass media																
<i>3. Stakeholders linkages for sustaining ICM built</i>	3.1 Map value chain and plan initial stakeholder workshop																
	3.2 Hold workshops and plan /review pilot schemes																
	3.3 Implement/adapt pilot schemes																
	3.4 Final workshop to review lessons learned																
<i>4. Impact of ICM adoption evaluated</i>	4.1 Conduct baseline survey; link to activity 1.1-1.3																
	4.2 Conduct (before and after analysis)																
	4.3 Synthesise and analyse the findings																
	4.4 Dissemination of impact assessment study																
<i>5. Project management and coordination</i>	5.1 Support organization of an inception workshop and establishment of CFC admin & accounting procedures; train local counterparts in project procedures																

COMPONENT	Activity	YR1				YR2				YR3				YR4			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	5.2 Advise on operational procedures and initiate consultancies where necessary																
	5.3 Assist PIAs and ICAC to prepare necessary documentation, including budgets and work plans.																
	5.4 Liaise between project donors and implementers and arrange exchange visits																
	5.5 Monitor project progress																
	5.6 Assist PIAs and collaborators with planning and co-ordination of activities																
	5.7 Prepare regular progress reports, mid-term evaluation report, annual accounts, audits and project completion report.																

2.6 Environmental Issues

The overall aim of this project is to improve cotton production efficiency in small-scale farming systems in Kenya and Mozambique. Cotton production can involve considerable artificial input use (pesticides and fertilizers) but this project is aiming at an holistic systems approach involving ICM. This approach seeks to incorporate appropriate technologies and best agricultural practices e.g. use of crop rotations, appropriate cultivation techniques, careful choice of seed varieties plus minimum reliance on artificial inputs such as fertilisers and pesticides. This holistic approach will lead to better management of on-farm resources and environmental conservation. The selective and rationalisation of inputs will reduce environmental contamination (contamination of water sources etc) and will reduce the impact of these pesticides on the farmers' health by reducing their exposure to toxic pesticides. Also, reducing the cost of inputs will mean that farmers' incomes will improve. In addition, with a reduction in pesticide inputs, natural enemies of the major cotton pests will flourish so provide a biological control for pests and the natural equilibrium between pests and predators and other natural enemies will return. This is especially so for secondary pests which can rapidly reproduce over a short time period in high input systems and cause additional management problems for the farmer due to the fact that their natural enemies have been removed due to injudicious use of pesticides.

2.7 Compliance with the ICAC Strategic Plan

The 2008 ICAC Strategic Plan identifies sustainable production systems as one of its strategic areas. It notes that in most cases the necessary technologies already exist, but because farmers lack knowledge and access to inputs, implementation is constrained. This is the situation in Mozambique and Kenya, where smallholder yields and profitability are well below potential and below the global average with 300-500 kgs and 400-600 kgs per hectare being produced respectively in 2004-05. This is very much lower than the levels being realized in some other cotton producing countries, such as Australia (1,982 kgs), Mexico (1,312 kgs) and China (1,119 kgs) and consequently there is an opportunity for considerable improvement. The project will use proven participatory approaches to build farmers'

knowledge, and using a value chain framework, identify and implement strategies for sustaining access to inputs and technical support, in two contrasting contexts (Kenya and Mozambique). This is also in line with the objectives of CFC's 3rd Five-Year Action Plan, which includes improving the cost-effectiveness of commodity production and scaling-up the impacts of improved production and other techniques.

2.8 Intellectual Property Rights

Technology and know-how acquired as a result of, or otherwise emanating from, the Project shall be the shared intellectual property of the Fund, PEA, and collaborating institutions. The Fund may take out and maintain any intellectual property right protection to the results obtained and for the processes elaborated under the Project, but only after due consultation with the PEA and Collaborating Institutions. The PEA and Collaborating Institutions are recognised as sole holders of their respective background intellectual property, and the Fund acknowledges and confirms that it has no sole rights to the technology and know-how acquired as a result of, or otherwise emanating from, the Project, that derives from this background intellectual property.

The PEA acknowledges and confirms that it has no sole rights of whatever nature to the technology and know-how acquired as a result of, or otherwise emanating from, the Project, and that it shall keep all such technology and know-how confidential, unless otherwise agreed with the parties to the project.

The Fund shall have the exclusive right to the publication, in whatever form, of the results and technical outputs of the Project. In doing so, the Fund shall fully acknowledge technical contributions made by the PEA and the Collaborating Institutions. The Fund shall own the copyright to and the revenues accruing from the sale of any publication issued by itself. The Fund may delegate fully or partly the right to publication to other parties involved in the Project.

2.9 Project Costs and Financing

The total cost of the project is estimated at USD 2,457,000. Of this amount, the CFC is contributing up to USD 1,464,600 in the form of a grant. The balance (USD 992,400) will be provided by the participating countries and the PEA as contribution in kind. In Annex I, Table 1, a summary table has been provided, identifying the project cost by project component and by source of financing. Table 2 provides the summary of project cost by category and source of financing. Consolidated, project-wide cost tables by category and by component (from which the summary tables are derived) are available in Annex II.

It is to be noted that in the tables in Annex I, the CFC contribution includes an EC co-financing contribution. A contribution of € 715,000 from the EC has been confirmed which amount to a project contribution of € 665,000 after allowing a compensation for CFC overheads of € 50,000 (7%). The actual counter-value of € 715,000 is set at USD 1,000,000 using the fixed exchange rate of € 1 = US\$ 1.40. A second contribution included in the CFC grant is an amount of USD 250,000 originating from the earmarked contribution of the OPEC Fund for International Development to the Fund's Second Account.

3. INSTITUTIONS INVOLVED, ORGANIZATION AND RESPONSIBILITIES

3.1 Project Executing Agency: CABI

CABI Africa
ICRAF Complex,
United Nations Avenue,
Gigiri,
PO Box 633-00621,
Nairobi,
Kenya

Tel: +254 20 72 24450

Fax: +254 20 71 22150

E-mail: M.Akiri@cabi.org

<http://www.cabi.org/datapage.asp?iDocID=366>

Contact person: Mr Morris Akiri (Director)

CABI is an intergovernmental, not-for-profit organisation which has been active in Africa since 1910. It is owned by 45 member countries including 16 countries in Africa. Each member government nominates a senior representative, typically a Director or Permanent Secretary, as CABI liaison officer within that country. Through the liaison officers' host organizations (typically NARS), CABI is linked into both national and regional networks of organizations involved in the development, uptake and application of new knowledge. Our role in international development is closely aligned with the Millennium Development Goals and with international treaties (e.g. Convention on Biological Diversity, World Trade Organization). CABI's headquarters are in the UK, but our activities in Africa are largely managed from the regional centre (CABI Africa) in Nairobi.

CABI Africa (Nairobi) will be the Project Executing Agency responsible for the overall execution of the project and will be responsible for disbursement of funds and project monitoring. It will work in close collaboration with the Project Implementing Agencies.

The Project Executing Agency (PEA) will implement and co-ordinate the project implementation with collaborating institutions in the participating countries. The PEA will be responsible for project management and will be accountable for the project budget. The PEA will administer the project finances as provided in the CFC Financial Procedures Manual and will ensure that the project accounts are audited every year.

The PEA will produce progress reports every six months in the CFC format. The PEA shall facilitate the supervision missions by ICAC and CFC and will also make arrangements for the mid-term and project completion evaluation.

3.2 Supervisory Body: ICAC (International Cotton Advisory Committee)

ICAC (International Cotton Advisory Committee)

1629 - K Street, NW, Suite 702

Washington DC 20006

USA

Tel +1-202-292-1687 (Direct), +1-202-463-6660 x122 (Main)

Fax +1-202-463-6950

<http://www.icac.org>

Contact person: Rafiq Chaudhry, Ph.D.

The supervisory body will be the International Cotton Advisory Committee (ICAC) based in Washington DC. ICAC is an intergovernmental organisation of over 40 member countries, some of which are the largest producers and consumers of cotton.

As the SB, ICAC will receive progress reports every six months from the PEA in the CFC format. These reports will be studied and compared with the annual work plan and performance indicators set before the report is submitted to the CFC with comments from the SB.

3.3 Project Implementing Agencies

Kenya:

Kenya Agricultural Research Institute (KARI)

P.O. Box 57811-00200

Nairobi

Email: director@kari.org

Tel: 0722206986/8, (254) 202041803303

Fax: (254) 02041803304

Contact person: Dr Lusike Wasilwa

Coordinating Research Centre in KARI

Kenya Agricultural Research Institute

Agricultural Research Centre- Mwea Tebere

P.O. Box. 298 - 10300

Kerugoya, Kenya

Phone: (254) 0202028216/7

Fax: (254) 0203589054

Email: karimwea@yahoo.com ; waweru.gitonga@yahoo.com

Contact Person: Dr Waweru Gitonga (Centre Director)

Collaborating KARI Centre

Agricultural Research Centre – Kibos

P.O. Box 1490-40100

Kisumu, Kenya

Tel: 0733857110 (mobile)

Email: otienokenneth@yahoo.co.uk

Contact Person: Dr Keneth Otieno (Centre Director)

The Kenya Agricultural Research Institute (KARI) is a premier national institution bringing together research programmes in food crops, horticultural and industrial crops, livestock and range management, land and water management, and socio-economics. KARI promotes sound agricultural research, technology generation and dissemination to ensure food security through improved productivity and environmental conservation.

KARI Mwea will be responsible for co-ordination of in-country partners, so that implementation of the project's activities will be effected and for submission of reports to the PEA.

Collaborating Institutions

Cotton Development Authority (CODA)
P.O. Box 66271-00800
Westlands, Nairobi, Kenya
Tel: (254) 0204444253; (254) 0203530908 (wireless)
Email:marygithaiga@yahoo.com
Contact Person: Ms Mary Githaiga

The Cotton Development Authority (CODA) has been formed to coordinate rehabilitation of the cotton industry in Kenya - the cotton (General) regulations, 2007 are intended to guide all the players/stakeholders in the industry and have been gazetted through a legal notice. They will be responsible for providing extensionists and identifying lead farmers to be trained in ICM and to support the demonstration program. CODA will encourage input and service delivery by private sector, improve access to technology and support to input use through ICM. Strengthen access to technology options through training of farmers using effective participatory extension approaches preferably participatory technology development and transfer, (i.e. offering options for farmers to choose from, example use of farmer field school approach. Broadly KARI will be responsible for ICM development and CODA for its promotion.

The Cotton Ginners Association (KCGA) and individual companies will also provide staff to be trained and run the inputs scheme on behalf of farmers. The KCGA may also run demonstration plots at their own cost or with assistance from other donors such as chemical companies under supervision of CODA.

Mozambique:

Instituto do Algodao de Mocambique (IAM) (Mozambique Cotton Institute)
Av. Eduardo Mondlane 2221, 1 Andar, C. P. 806
Maputo - Mozambique
Tel: +258 21 431015/6
Fax: +258 21 430679
Email: nmahalambe@iam.gov.mz
Contact Person: Dr Norberto Mahalambe (Director)

The Project Implementing Agency (PIA) in Mozambique will be the Mozambique Cotton Institute (Instituto do Algodao de Mocambique (IAM)). Founded in 1991, IAM is an autonomous Government Institution with its headquarter in Maputo, where the Directorate is based. IAM is represented at decentralized level by four Delegation covering different cotton-producing zones in the country, each of which is lead by the Delegate and comprises both technical and administrative staff. IAM has the mandate for overall coordination of the cotton sub-sector throughout its value chain. This include, policy and regulation formulation and enforcement; promotion of research and technology transfer to farmers; monitoring and evaluation of both process and result based sub sector indicators; leading the technological

innovation within the farming system from seed to harvest; price negotiation between companies and farmers, assessment of the quality of lint; and monitoring of the export process.

IAM will administer the budget for Mozambique partners and will have a facilitating role with the cotton companies. In addition, IAM will be responsible for coordination and ensure timely engagement of the collaborating agents including; logistics, missions and events, procurement of goods and services rendered to the project within the country, and preparation of in-country progress and financial reports for submission to the PEA.

The cotton institute has initiated a demonstration plots to promote Integrated Pest Management (IPM) package in some cotton producing areas in Mozambique. Thus, IAM will ensure that the present project builds on what had already started, by linking the new project with the companies and farmers in the respective zones. However, a continued training is required to upgrade the skills of the technical staff. Special requirements would involve the development of mass rearing and handling techniques and expertise for producing locally the cotton pests' natural enemies, paving way for augmentation of the natural enemies as required.

Collaborating Institutions

Department of Crop Production and Plant Protection

Faculty of Agronomy and Forest Engineering

Eduardo Mondlane University

Campus Universitario, Edifício No.1

Av. Julius Nyerere

Tel: 258-21-492177/8

Fax: 258-21492176

Maputo, Mozambique

Contact persons: Domingos Cugala (PhD, Entomology): E-mail: dcugala@uem.mz;

Cel:+258823148430

Luisa Santos (PhD, Entomology): E-mail: luisa@zebra.uem.mz; Cel: +258823079310.

The Eduardo Mondlane University's Department of Crop Production and Plant Protection, Faculty of Agronomy and Forest Engineering will provide technical and training inputs in Mozambique. They will also be involved in data collection of on field performance of ICM

Instituto do Investigação Agrária de Moçambique (IIAM) (Mozambique Institute for Agrarian Research)

Centro Zonal Nordeste-IIAM-Posto Agronomico de Nampula

C. P. 622, Av. Das FPLM, via corrane

Nampula-Mozambique

Tel: 258 820789140 (cell)

Fax: +258 26340001

Email: fernando_chitio@hotmail.com

Conatct Paerson: Fernando Chitio (Center Director)

IIAM is the national agricultural research institute in Mozambique comprising of four Centres countrywide according agro-ecological zones. The Northern Zone is based in

Nampula and is mandated to work both food and cash crops including cotton. The institution has the role of conducting trials and field demonstrations in several areas such as; cotton breeding and new varieties selection; basic seed production; maintenance of cotton varieties; conducting trials in IPM using scouting procedures e.g. before insecticide application, moth trap (burned sugar to trap moth) and other procedures; crop rotation with other crops (e.g. sorghum, sesame, maize, cowpeas, etc.) to reduce the incidence of traditional cotton insect pests, and research in animal traction in cotton production. IIAM will provide technical capacity (human resources) to facilitate running of the participatory demonstration plots, data collection and analysis. They will also facilitate development of linkage communication mechanisms between the key stakeholders in the cotton value chains.

4. PROJECT MANAGEMENT

4.1 Schedule of reporting

Reports will be according to the schedule in Table 8. Reporting activities are further described below.

Table 8. Schedule of reporting

Deliverable	Completion date
Inception Report	3 month
Half Yearly Reports	6, 18, 30, 42 month
Annual reports	12, 24, 36, 48 month
Annual Workplans & Budgets	12, 24, 36 month
Annual Audit Reports	12, 24, 36, 48 month
Project Completion Report	48
Mid- Term Review Report	24 month
Final Evaluation Report	48 month

- **Inception report and Project Management Plan.** This to be completed following the detailed planning occurring at the Inception Workshop in 2009 (which ICAC and CFC will attend) and three months after project start at the latest. This to contain a detailed management plan with an updated budget, a fully-revised Gantt chart. The PMP to include milestones and deadlines for major tasks and products.
- **Project Coordination Committee.** A project coordination committee (PCC) will be formed, consisting of the PEA, implementing agencies and coordinating parties, to which CFC and ICAC will be invited. It will meet under the auspices of the annual workshops and electronically as necessary. The role of the PCC will be to:
 - ♣ Approve all major plans and authorize any significant deviation from agreed work plans.
 - ♣ Make sure that required resources are committed, and arbitrate on any conflicts within the project or negotiate a solution to any problems between the project and external bodies.
 - ♣ Agree with PEA on responsibilities and objectives
 - ♣ Provide overall guidance and direction to the project, ensuring it remains within any specified constraints
 - ♣ Take ownership of any identified risks as allocated in work plans at the time of approval

- ♣ Provide assurance that all outputs have been satisfactorily delivered
 - ♣ Approve the final project report
- **Annual workshops** will be convened to carry out formal and informal end-of-year reporting on activities and results by each partner country, and by other organisational participants. Intensive effort made to draw out the most significant stories (MSC), lessons learnt and identify best-practices. These events also to cover the planning of the following years activities and to refine the project progress indicators.
 - **Annual Report of the Project** – 31st January in each year of the project, using inputs from the annual workshops. Reporting against progress indicators as listed in the logical framework; and to analyse risks and assumptions. To include an annual management plan laying out work and products due that year.
 - **Six-monthly reports** due June 30 and December 31 each year, reporting on activities, outlining tactics and charting progress.
 - **Mid-term review**, to be carried out by an external team – to be undertaken in consultation with CFC and ICAC.
 - **A final workshop** to disseminate project results, recommendations and lessons learned
 - **Final Report** of the Project – four years from the project start.

4.2 Assumptions and risk assessment: risk management

There are a number of risks that could potentially affect implementation of the project, and hence, the achievement of project objectives. Such risks have been carefully considered during the process of project formulation and appraisal and appropriate measures have been included in the project design to mitigate against such risks. These risks are presented below.

One risk is that market prices for cotton remain profitable for small scale cotton producers or there is likely to be further abandonment of cotton in favour of other crops. Choice of participating farmers will be crucial here and the PEA will work together with the PIAs to ensure this risk is minimised although prices have been volatile. High prices were seen at the start of 2008 but recently cotton prices have been reported to be falling (October 2008). Farmers will also have to have ready access to required inputs and that may not be possible in some of the isolated rural communities where infrastructure is poor. There is a risk that ginneries may not wish to commit resources to produce training material and that risk may be greater in Kenya where farmers can sell to whom they like. Again choice of ginneries, their location and relationship with supplying farmers will be crucial. Much of this project is dependent on developing positive relationships with the local actors along the value chain as well as with NARS. A component of this project is designed to specifically ensure that stakeholder linkages along the chain are examined and pilot schemes developed to try to improve the delivery of inputs and of technical support to be sustainable after the project is completed.

There is a risk that due to financial constraints in the local collaborating institutes, the project may not be effectively implemented. This risk has been minimised by the provision of

support and training to enhance the capacity of the local counterpart so that CFC procedures will be implemented properly. There is some financial risk in that financing from all sources made on a timely basis in tandem with proposed activities & annual work plan, budget etc and linked to this is a risk that resources are available and will be provided in good time. This risk is mitigated to some extent by the choice of partner and the partner's understanding of their clear obligations financially and technically (at the project's inception).

The sustainability of operations after the project is crucial to achieving the ultimate objective of a more general and wider application of the systems to be developed under this project. The risk that operations will not be continued after project completion has been mitigated in a number of ways:

- The institutions involved will participate because of the benefit they expect to derive from the project and will be committing their own resources to strengthen their operations to effectively implement those aspects of the project specifically related to their institution's objectives;
- In selecting the partners, the PEA and others has worked with them previously (in Kenya) and they have shown themselves to be responsible partners, accepting and taking up the results and recommendations of the project.

Another risk is that there are conducive agricultural policies of governments and commitment of participating organisations Under the Kenya Government's policy for addressing poverty 'Kenya Vision 2030', cotton has been identified as a key sub-sector with the potential to benefit 8 million people in the drier areas of the country so this risk should be minimised there and the commitment of participating organisations will be encouraged through their early involvement in the project's development so they have ownership. It is essential that all project participants remain committed to project purpose. Another key risk is that there is an availability and willingness of potential trainers/farmers for being involved in the project but selecting trainers from the many stakeholder groups along the value chain (local extensionists, input suppliers and the ginners) availability should not be an issue.

Personnel including external consultants must be competent in required skills and there is an assumption that such people can be identified and will commit to project activities. CABI works globally and regionally and has access to information for the selection of the best consultants and CABI will work with the PIAs to try to ensure that anyone participating in the project will remain committed to the project's activities.

There are some external risks which should be mentioned but for which project stakeholders cannot be responsible for e.g. the project will be implemented in Kenya and Mozambique and assumes political stability within those countries. Also it is assumed that cotton yields are not affected by adverse climatic conditions or unprecedented pest attack.

4.3 Disbursements, Procurement, Accounts and Audits

Disbursements against the purchase of project items individually costing the equivalent of a *de minimus* of USD 500 or more will be fully documented and retained in a central location by the PEA. Staff salaries and allowances, operating expenses, training costs and supplies and all other incurred project costs shall only be reimbursed by the PEA against certified Statements of Expenditure (SOEs) from PIAs. It will be incumbent upon PIAs to

retain copies of expenditure documentation for all items (including below *de minimus*), in a central location for review by the PEA, ICAC or CFC.

Procurements will take place in accordance with the CFC's Regulation and Rules for the Procurement of Goods and Services from the Second Account.

Disbursement and Procurement guidelines as described in the Financial Procedures Manual of the CFC will be used and detailed in Schedule 3 of the Project Agreement.

Accounts and Audits: All PIAs in the project will maintain financial records and accounts in accordance with sound and internationally accepted accounting practices, and will submit to the PEA audited annual accounts within two months of the close of the project fiscal year. As supplement to the annual audited financial statements and auditors report for each reporting period, the PEA shall furnish to the Fund interim financial reports covering the previous six months together with the progress report. The PEA will keep consolidated accounts for the project and prepare consolidated financial statements in accordance with the CFC's Financial Procedures Manual. The PEA will arrange for an annual project audit by independent auditors, which will be submitted in line with the requirements stipulated in the CFC's Financial Procedures Manual.

4.4 Organization, management and Implementation

The PEA will have the overall responsibility for executing the project including overall co-ordination of implementation, planning, budgeting, accounts and procurement.

The project will be implemented based on annual work plan and budget consistent with the project budget approved by the Supervisory Body and the Fund. The PEA, in close collaboration with the participating agencies, will prepare a draft work programme and budget including task assignments to be undertaken by the respective collaborating agencies. This draft work programme will cover in sufficient detail, the activities to be carried out during the period by the respective agencies and the PEA. The programme will include a schedule of reporting by the collaborative agencies. This draft work programme and budget will be cleared by ICAC and made available to the CFC with their comments, two months before the start of each year. The CFC will review and approve the final annual work programme and budget.

4.5 Monitoring and Evaluation

The PEA shall review with each PIA at the start of the project existing knowledge as well as prepare and finalise year one work plans and budgets. The PEA in collaboration with all project participants will prepare and submit detailed work plans specifying components and activities to be carried out over the year, with a related budget, not later than two months before the start of implementation. A Project Manager will be appointed within the PEA based in Nairobi, who will liaise with coordinators from PIA in both countries to monitor the progress of the project against the deliverables outlined in the work plans.

Each PIA will produce reports relating to project activities undertaken that will be submitted to the PEA to serve as the basis of a six-monthly progress reports to be prepared by the PEA for the ICAC and CFC. A consolidated annual report will also be submitted to the ICAC and

CFC within 3 months of the close of the reporting period.

The PEA will organize a workshop in each country to review the project during the second year, followed by a mid-term evaluation of the project by independent consultants in the third year. Within three months of the conclusion of the project, the PEA will submit a final technical report along with full audited accounts to ICAC and CFC.