# INTERNATIONAL TROPICAL TIMBER ORGANIZATION

## Completion Report

**RED-PD026/09Rev.1(F)**

REDUCING EMISSIONS FROM DEFORESTATION AND FOREST DEGRADATION

TitleREDUCING EMISSIONS FROM DEFORESTATION AND FOREST DEGRADATION THROUGH COLLABORATIVE MANAGEMENT WITH LOCAL COMMUNITIES

Serial Number1

Host Government: GH

Executing Agency: FORESTRY RESEARCH INSTITUTE OF GHANA (FORIG)

Starting date of the project: 20/04/2010

Project Duration: 48

# Completion Report

Version:1.0

Date:28/09/2016


Executing Agency's full name:

FORESTRY RESEARCH INSTITUTE OF GHANA (FORIG)

Executing Agency's address:

P.O. BOX 63
KUMASI, GHANA

Executing Agency's telephone:

2335160123

Executing Agency's fax:

2335160121

Executing Agency's email:

director@csir-forig.org.gh


Information on Collaborating Agency(ies):

NONE

Technical Staff / Scientific Staff:

No Staff

Disclaimer:

The views expressed in this report are those of the authors and do not necessarily reflect the views of ITTO or the Government of Ghana

# Completion Report

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## Disclaimer

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## Executive Summary:

Executive summary

The Ankasa conservation area which is the study area of the project is surrounded by a number of communities. By virtue of proximity to this area, communities depend on it for their livelihood.

This project originated from a study made on flora, fauna and habitat assessment of the community Resource Management Areas (CREMAs) surrounding the Ankasa Conservation Area.The key problem addressed was the unsustainable conservation of the Ankasa National Park that leads to deforestation and forest degradation and increased carbon emissions in the area.

The development objective of the project was to contribute to sustainable management and conservation of Ankasa Conservation Area to improve the provision of environmental services and reduce GHG emissions from deforestation and degradation as well as enhance carbon stocks.

The specific objective was to develop and implement participatory, good governance and management system for the Ankasa conservation area, methods for measurement, assessment reporting and verification (MARV) for forest carbon as well as estimation of the value of environmental services.

The strategies used in the projects implementation include i) Participatory management of the Conservation Area: ii) Enhancement of biodiversity and carbon stocks, as well as reduction of emissions iii) Awareness and knowledge on REDD at local and regional level; iv) Community participation in forest conservation, monitoring of illegal logging and forest encroachment; iv) Governance and benefit sharing arrangements for REDD development, and REDD concept mainstreamed within SFM activities; v) Verifiable method for carbon accounting and monitoring development; vi) Baseline emissions and potential carbon credit under REDD project scenario determination.

One activity was added during the projects implementation. This was done at the project steering committee meeting with approval from ITTO. The planned specific objective, outputs and associated activities did not change and have all been completed within schedule but with extension of additional 9 months with no extra budget from ITTO.

## Executive Summary:

Techniques, strategies and governance lessons for engaging local communities to integrate trees on farmlands (cocoa) outside forest reserves have been developed; economic value and REDD opportunity cost of forest resources of the project area have been estimated; and methodologies on measurement, assessment, reporting and verification have been developed using data collected in the project site. These have provided better understanding of DFD and CO2 emissions in the study area. These strategies and methods also provide measures to help address the DFD and improve environmental conditions in the study area before the project implementation.

The primary beneficiaries including the local communities and the park management have been involved in the development of the strategies, methods and measures. In this way their capacities have been built and it would be easier for them to continue with project interventions with some support from the other stakeholders because they own these strategies and methods.

The inventory and the registration of farmers and their trees planted on the farmlands that have been done under this project have raised the interest of farmers in this activity. A lot more farmers in and outside the project communities have shown interest in this exercise and are requesting for timber tree seedlings to plant. This will facilitate the reduction of DFD, and enhance carbon stocks in the study area.

In developing the methods for the Measurement, Assessment, Reporting and Verification (MARV) under this project, sample plots for biophysical data collections have been laid, baseline land cover change maps have been produced, the baseline carbon stocks of the project site have been produced, community monitoring schedule have been drawn and communities trained on monitoring DFD related activities and pilot community-based forest monitoring data collected and report produced. These are important information obtained from the project that is relevant for monitoring DFD, and carbon emission reduction activities in and outside the project sites.

The partnership between the local communities and the park management within the CREMA structure was also a very helpful medium that assisted the identification process, development and implementation of this project. Within the CREMA structure, the key problem of the project was thoroughly analyzed in collaboration with the key stakeholders. This enabled project design to be very sound because, there were sufficient interventions including the outputs and corresponding activities to address the problem.

The implementation of the project was participatory. The active collaboration and participation of the partners and stakeholders of project ensured its smooth operation. Further, the field monitoring by ITTO and the executing agency contributed significantly to the successful implementation of the planned project activities.

The key problem to be addressed by a proposed project must be adequately analyzed in the best way that correctly identifies relevant main-causes and sub-causes of the problem as the basis for defining relevant project elements and interventions. Further, to achieve the soundness of a project design, it should be closely linked with adequacy of problem analysis

Roles and responsibility of the stakeholders need to be identified and assigned prior to the

implementation of each activity of the project. This helps to forestall any risk and confusion and bring about smooth implementation of the project

It is advisable to put together, a well dedicated project management team, ensure timely availability of inputs in terms of funds and establish PSC to provide good counsel to project management team. Further, a project is to be implemented in a participatory manner. This will engage the stakeholders and help create ownership and increase support to the project during its implementation and after completion.

It is recommended that a sustainability plan be drawn and discussed with the project stakeholders and partners. This ensures that actions and programs to be taken to ensure sustainability of the project after completion are identified at these discussion sessions and the responsible institutions identified to make follow up on these actions and programs.

Field monitoring by ITTO and the executing agency is required to ensure the successful implementation of the planned project activities. During these monitoring exercises, challenges associated with the implementation of the project need to be identified and addressed, primary beneficiaries (e.g. local communities) encouraged to continue to work on the project and their needs related to the project also identified and addressed.

## Context:

1.1 Context

The mainstay of the Jomoro District, which is the main study district of the project, is subsistence farming and petty commerce with coconut farming dominating. Land for farming in the district is acquired mainly through the share cropping system. The economy of this district is mixed, consisting of large traditional agricultural sector made up of mostly small-scale peasant farmers.

The Ankasa Conservation Area which is the study area of the project is surrounded by a number of communities. By virtue of proximity to this area the communities depend on it for their livelihood. Ankasa Resource Reserve and the contiguous Nini-Suhien National Park that comprise the ACA as the project site are Wildlife Protected Areas located in the wet evergreen forest area of the South-Western Region of Ghana.The Ankasa Conversation Area is about 365 kilometers west of Accra near the border with Côte d'Ivoire. The park is approximately 500 square kilometers, and consists largely of tropical evergreen rainforest. The study area is the wettest part of the country with average annual rainfall more than 1732mm.

This project is relevant to the National Forest and Wildlife Policy (2012) which has among its objectives, the management of the existing forest estate for sustainability of timber and non-timber resources, expansion of the nations forest cover for increased yields of domestic and industrial products, rehabilitation of denuded lands, protection of water catchments and stream banks and enhancement of the natural environment.

Further, this project contributes to national and regional programs including: i) the Forest investment programme (FIP); ii) the National Forest Plantation Development Programme; iii) Two Concession

## Context:

Agreements approved and signed for implementation with two private investors, namely Eco-lodges Ghana Limited and Black Star Eco-City Limited, for ecotourism investment in Mole, Kakum and Ankasa Conservation Areas; iv) Japanese Government grant of US$7.8 million to the Government of Ghana under the Forest Preservation Programme (FPP) for capacity building in Geographical Information System (GIS) that will enable Ghana access benefits from Reducing Emission, Degradation and Deforestation (REDD+) and other emerging financial mechanisms; v) Ghana REDD+ Readiness Preparatory Proposal (R-PP) which outlines the process by which the Government of Ghana will develop its national REDD+ strategy and to adopt interventions or options to address drivers of DFD in the country; and v) Ghanas Intended Nationally Determined Contribution (INDC)

## Origin and Problem:

1.2 Origin and problem

This project originated from a study made on floral, fauna and habitat assessment of the community Resource Management Areas (CREMAs) surrounding the Ankasa Conservation Area. During this study the local communities acknowledged that although the Park was of very much relevant, they were not involved in the management of the area. They also complained that the park doesnt help them with their livelihood thus they undertake illegal activities to support their livelihood. It was agreed that there was some vegetation change which they thought was due to the change in the weather patterns but were not aware of climate change. During the debriefing session at the end of the study, it was proposed that the research team look at how to get communities involved in the management and also to improve their livelihood. Therefore, when the call for proposal on ITTOs thematic programme on Reducing Deforestation and Forest Degradation and Enhancing Environmental Services in Tropical Forests (REDDES), was made, this proposal was developed and discussed with the local communities who gave their approval.

The Ankasa conservation area is the project site for this ITTO project. The forest has the most biological diversity of any in Ghana, with over 300 different plant species recorded in a single hectare. Ankasa is considered to be the 'hottest' forest in Ghana; it contains one of the few remaining blocks of relatively untouched forest in the country. This, in addition to the faunal diversity of the site, makes the area one of the most important sites for conservation of forest biodiversity in Ghana. However, due to encroachment of the park by local communities for unsustainable shifting cultivation for food and cash crops as well as illegal logging in and around the park, the park is being over-exploited leading to a lot of DFD. The impact of this is that there is reduced supply of forest products which the local communities depend on. There are also increased CO2 emissions, loss of biodiversity and reduced water quality and supply, increased soil erosion. All these have resulted in the poor conservation of this area leading to continued deforestation and degradation.

These effects aggravate the poverty of already poor people in the area, deteriorate livelihoods and lead to displacement of people to urban centers such as Takoradi, Accra and other places. It leads to conflicts among the different villages around the park over the forest resources which they depend on for their livelihoods. Following from this, it is imperative that management of the Ankasa Conservation Area (park) aimed to conserve biodiversity, provide ecosystem services, including reducing emissions and enhancing carbon stocks in order to mitigate climate change as well as maintain the livelihood of the local communities. However these aims are not being achieved because of i) Inadequate

## Origin and Problem:

involvement of local communities in the planning  management of the conservation area; ii) lack of information on the financial worth of ecosystem services provided by the conservation area; iii) lack of good governance and benefit sharing arrangements and PES; and iv) local communities do not have the capacity for monitoring REDD  lack of standard methodologies for local communities participation in monitoring REDD.

## Project objectives and implementation strategy:

Rationale

Due to encroachment of the ACA by local communities for unsustainable shifting cultivation for food and cash crops as well as illegal logging in and around the park, the park is being over-exploited leading to a lot of deforestation and degradation. Recent studies by CARE international of the park indicates that there has been significant reduction in number of plant species including NTFP producing plants as compared to about five years ago. This increases the vulnerability of local communities to climate change as well as loss of economic development opportunities for local populations living in and around forest areas. All these have resulted in the poor conservation of this area leading to the continued deforestation and degradation and increased carbon emissions.

It is therefore essential that management of the conservation area (park) is aimed at conserving biodiversity, providing the ecosystem services, including reducing emissions and enhancing carbon stocks in order to mitigate climate change as well as maintaining the livelihood of the local communities. However these aims are not being achieved. This project therefore aimed at ameliorating these conditions through participatory management and good governance so that provision of goods and environmental services by the Ankasa Conservation Area is maintained and enhanced, thereby preventing and reducing deforestation and degradation and improving livelihoods of the local communities. The interventions of this ITTO project are intended to address these challenges and support this conservation area to perform its function of reducing emissions from deforestation and degradation and enhancement of carbon stocks.

2.2 Development objective

The development objective is to contribute to sustainable management and conservation of Ankasa Conservation area to improve the provision of environmental services and reduce GHG emissions from deforestation and degradation as well as enhance carbon stocks in tropical forests.

2.3Specific objective

The specific objective is to develop and implement participatory, good governance and management system for the Ankasa conservation area, methods for measurement, assessment reporting and verification (MARV) for forest carbon as well as estimation of the value of environmental services

2.3 Implementation strategy

The strategies used in the projects implementation under the technical and scientific aspects include the following

## Project objectives and implementation strategy:

i) Participatory management of the Conservation area: Community Resource Management Areas have been formed as part of the management of the Conservation area. However the committees responsible for these CREMAs lacked the capacities for management for conservation, including the restoration and rehabilitation of the degraded areas. They were also not motivated because they lacked resources for the management. Thus the project built the capacities of the committees for management and monitoring of the resource base as well as for restoration and rehabilitation. It provided resources needed for management including the provision of alternative livelihoods.

ii) Enhancement of biodiversity and carbon stocks, as well as reduction of emissions: In order to achieve the above objective, regular monitoring of the resource base with collaboration of the local communities was established. Thus the local communities were trained in the collection of all relevant data on biodiversity, carbon stocks and emissions. To facilitate monitoring, community based forest monitoring unit has been established under the CREMA structure

iii) Awareness and knowledge on REDD at local and regional level developed: Approaches here involved organization of workshops at the local and regional levels. Information delivery through community radio broadcast was employed. Brief education materials on REDD in simple and easy to read languages (English and vernacular) were presented to stakeholders at the various workshops and community meetings

iv) Community participation in forest conservation, monitoring of illegal logging and forest encroachment improved: Approaches included stakeholder consultation at various levels through workshops and community interactions. The CREMAs were strengthened through training, provision of logistics and incentives to improve their role in forest conservation, monitoring of deforestation and forest degradation related activities in the landscape

v) Governance and benefit sharing arrangements for REDD developed, and REDD concept mainstreamed within SFM activities. Local level governance structures were identified and for strengthening. Multi-stakeholder dialogues were used to promote policy harmonization as well as integration of local level initiatives in national strategies. Equitable benefit sharing arrangements as well as responsibilities were identified for development through stakeholder consultations. The capacity of the local communities on activities that contribute to SFM was enhanced and measures taken to mainstream these activities in their land use practices. Local level practices on SFM and good governance were identified and documented and lessons leant to serve as inputs in formulating the guidelines.

vi) Verifiable method for carbon accounting and monitoring developed: In order to establish a verifiable methodology for carbon monitoring and accounting, the approach involved the most up-to-date, but cost effective GIS and remote sensing based REDD monitoring methodologies. Field measurements were made using standard, but rigorously applied, forest sampling methods to assess forest biomass/carbon stocks. Recommended allometric equations suitable for the project area were used to estimate biomass stocks. Without compromising on scientifically approved standards, the project adopted measures that made local communities to play active role in carbon measurement and monitoring. Participatory GIS tools were employed to build and enhance the capacity of the local

communities in forest resource and carbon mapping. This fostered transparency, helped increase benefits to the local people and also reduce the transaction costs associated with carbon measurement and monitoring.

vii) Baseline emissions and potential carbon credit under REDD project scenario determined: The project explored baseline approaches that reflect the local (national) circumstances. The project used approaches based on GIS modelling and remote sensing multi-resolution methods for mapping and qualitative analysis of baseline scenarios, estimation of emissions and enhancement of carbon stocks. GIS models that incorporate biophysical factors as well as socio-economic spatial information were explored. Monitoring of forest cover change was done using satellite remote sensing for determining baseline deforestation rates against which future rates of change can be based. Adequate validation and accuracy assessments were carried out to determine the levels of uncertainties contained in the estimates. All these approaches were meant to provide improved spatially explicit information on the location of carbon stocks.

2.4 Assumptions and risks

The project had the objective of empowering local communities to participate in the management and governance of the National Park to achieve its prime aim of conservation and provision of environmental services. Thus major stakeholders in this regards are the local communities and the Officials of Wildlife Division who are currently managing the Park. The project assumed there may be conflict between officials of Wildlife division as the administrators and the local communities concerning the utilization of goods and services in the study area. The project assumed that if this conflict is not minimized it could demotivate the local communities and as such prevent them from undertaking the project activities. This had been identified as one significant risk of the project. To minimize this risk, the following actions were organized i) determination of potential risks and actions to mitigate these through participatory consultation with all stakeholders; ii) development of conflict resolution mechanism between the stakeholders; iii) empowerment of local communities in the implementation of the mechanism; iv) enhancement community forest enterprise around the conservation area to promote alternative livelihoods to local communities; v) Scaling up and dissemination of good lessons learnt in the implementation of project to the wider community in the Ellembelle and Jomoro Districts within which Ankasa National Park is located, as well as throughout the country.

## Project Performance:

3.1 Planned verses realized project elements

One activity was added during the project implementation-Activity 3.5 (Table 1). This was done at the project steering committee meeting with approval from ITTO. The planned specific objective, outputs and associated activities did not change as in Table 1. These activities have all been completed within schedule but with extension of additional 9 months with no extra budget from ITTO (Table 1).

Table 1: Realization of project elements based on YPO1, YPO2, and YPO3, YPO4, YPO 5 (6 months extension September 2015) and YPO (3 Months extension December 2015)

Description of output/activities Realization Remarks

Objective:

## Project Performance:

Development objective:

to contribute to sustainable management and conservation of Ankasa Conservation area to improve the provision of environmental services and reduce GHG emissions from deforestation and degradation as well enhance carbon stocks in tropical forests

Specific objective:

to develop and implement participatory, good governance and management system for the Ankasa conservation area, methods for measurement, assessment reporting and verification (MARV) for forest carbon as well as estimation of the value of environmental services

Output 1

Participatory management system developed and implemented

1.1 identification of management system of areas surrounding conservation area 100%

1.2 identification of relevant local stakeholders 100%

1.4 strategic analysis of the drivers of forest degradation and deforestation 100%

1.5 participatory development of management system 100%

1.6 Implementation of developed system 100%

Output 2

Financial value of the environmental services provided by the conservation area determined

2.1 identification of the ecosystem services provided by the conservation area 100%

2.2 Determination of the financial value of these services 100%

2.3 Validation of the estimates of the financial values 100%

2.4 Preparation of final report with estimates 100%

Output 3

Good governance and benefit sharing arrangements for PES developed

3.1 Determine framework for good governance and benefit sharing for REDD 100%

3.2 Development of best practice guidelines for forest governance 100%

3.3 Stakeholder consultation to validate best practice guidelines 100%

3.4 Dissemination of good practice schemes and lessons to stakeholder groups 100%

3.5 Inventory and registration of trees planted by farmers 100% Additional activity

Output 4

Participatory methods for measurement, assessment, reporting and verification (MARV) of forest carbon developed and implemented

4.1 participatory development of verifiable method for forest carbon estimation and monitoring developed 100%

4.2 Determination of baseline carbon stocks 100%

4.3 Establishment of baselines of forest cover changes 100%

4.4 Participatory estimation of emissions reduction and enhancement in sequestered carbon under REDD project scenario 100%

4.5 Participatory development of reporting and verification methods 100%

4.6 Establishment of social baselines and institutions for monitoring REDD 100%

3.2 Project duration

The project commenced in April 2010. The planned duration was 48 months while the realized

duration was 57 months.

3.3 Project budget

The total budget for the project is US$760,408.00. Out of this, ITTO contributed US$ 658,716.00 (Table 2) and the Government of Ghana (GOG) contributed US$101,692.00 (Table 2) for the purpose of the project implementation. Of the ITTO contribution, US$554,922 was realized and applied in the project implementation. The remaining amount of US$ 103,794 was used by ITTO for i) ITTO monitoring and review (US$40,000); ii) ITTO mid-term and expert evaluation (US$15000); and iii) ITTO programme support cost (8%) (US$48,794). The realized amount from the ITTO contribution for the project implementation was released in seven installments. The first installment of US$169,992.00 was received on 20th April 2010, the second ($59,996.00) on 4th March 2011; the third ($79,996.00) on 9th Dec 2011; the fourth ($65,990.00) on 13th February 2013; the fifth ($50,000.00) on 18th September 2013; the sixth ($90,000.00) on 9 December 2014. The seventh and the last installment of US$38,922.34 was received on 6 November 2015. This amount was received after the submission of the sustainability plan of the project, after its completion, to ITTO by the executing agency.

Table 2: Financial situation of the project (ITTO and EA contributions in US$)

Component Original Original amount
EA
Amount
ITTO
I. Funds managed by Executing Agency:
10. Project Personnel
11 National Experts (long term) $122,700.00 $19200.00
11.1 Project Coordinator $33,600.00 $9600.00
11.2 Agro forester $10,000.00
11.3 Forester $18,000.00
11.4 GIS/Remote Sensing Expert $16,000.00
11.5 Silviculturist $10,500.00
11.6 Socio-economists $13,750.00
11.7 Forest Technicians $11,250.00
11.8 Administrator $9,600.00 $9600.00
12 Other Personnel $94,550.00
12.1 Driver $14,400.00
12.2 Secretary $14,400.00
12.3 Incentives to communities $65,750.00
13 National Consultant(s) $5,000.00
13.1 Consultant on ecosystem services $5,000.00
14 International Consultant(s) $10,000.00
14.1 GIS/RS Carbon Accounting $10,000.00
19 Component Total: $232,250.00 $19200.00
20. Sub-Contract $0.00
21 Sub-contract
22 Sub-contract
29 Component Total $0.00
30. Travel

31 Daily Subsistence Allowance $67,900.00
31.1 National Expert(s)/Consultant(s) $63,900.00
31.2 International Consultant(s) $4,000.00
32 International Travel $22,000.00
32.1 National Expert(s)/Consultant(s) $18,000.00
32.2 International Consultant(s) $4,000.00
33 Local Transport Costs $0.00
33.1 National Experts/Consultant(s) $0.00
33.2 International Consultant(s) $0.00
39 Component Total: $89,900.00
40. Capital Items $40,000.00 $12800.00
41 Premises $0.00 $8000
42 Land $0.00 $4800.00
43 Vehicle(s) $40,000.00
44 Capital Items Equipment $80,300.00
44.1 Computer Equipment (Computers, printers, etc) $14,000.00
44.2 Forestry Equipment $13,300.00
44.3 Plotter $10,000.00
44.4 Softwares (ArcGIS, Erdas Imagine, etc.) $33,000.00
44.5 Ipas (with GPS+ArcPad Software $10,000.00
49 Component Total: $120,300.00 $12800.00
50. Consumable Items $78,872.00 $6000.00
51 Raw materials $16,800.00 $2000.00
52 Spares (Including vehicle maintenance) $20,872.00
53 Fuel Utilities $31,200.00
54 Office supplies $4,000.00 $4000.00
55 Media, Publication and Education $6,000.00
59 Component Total: $78,872.00 $6000.00
60. Miscellaneous $33,600.00 $4000.00
61 Sundry $20,800.00 $0.00
62 Audit Costs $4,800.00 $0.00
63 Contingencies/steering committee $8,000.00 $4000.00
69 Component Total: $33,600.00 $4000.00
70. National Management Costs $0.00 $59692.00
71. Executing Agency Management Costs $59692.00
72. Focal Point Monitoring -
79. Component Total $0.00 $59692.00
Sub-Total $554,922.00 $101692
80. Project Monitoring Administration $103,794.00
81. ITTO Monitoring and Review $40,000.00 -
82. ITTO Mid-term and Ex-post Evaluation $15,000.00 -
83. ITTO Programme Support Costs (8%) $48,794.00 -
89. Component Total $103,794.00 -
90. Refund of Pre-Project Costs (Pre-Project Budget) -
Sub-Total $103,794.00 -

## Project Performance:

100. GrandTotal $658,716.00 $101692.00

## Project Outcome, Target Beneficiaries Involvement:

## Thematic Programme:

4.1 Specific objective achieved

The achievement of the specific objective has been assessed following the outcome indicators specified in project document as

Outcome indicator # 1: Participatory management system and good governance

For the development of the participatory management plan, the following activities specified in the project document under output 1 were undertaken; i) Identification of management system of areas surrounding conservation area; ii) Identification of relevant local stakeholders; iii) Strategic analysis of the drivers of forest degradation and deforestation in the Conservation area; iv) participatory development of management system; v) Implementation of developed system; vi) evaluation and review of management system.

The stakeholder analysis has been done and a technical report produced on stakeholder analysis in Ankasa Conservation area. In this report, the most influential groups of stakeholders that are key in the sustainable management of the conservation area have been identified. The report concludes that there is the need to empower or increase the power base of the highly ranked stakeholders (i.e. farmers) with high concern, but lower power for this conservation area. The strategic analysis of the drivers of forest degradation and deforestation in the conservation area has also been done. From this activity, one poster (Figure 1) and one journal article published in Biological Conservation have been produced.

Figure 1: Poster produced from activity iii under output 1 of the project

The journal article is cited as Damnyag, L., Saastamoinen, O., Blay, D., Dwomoh, K.F., Anglaaere, N.L., Pappinen, A. 2013. Sustaining protected areas: identifying and controlling deforestation and forest degradation drivers in the Ankasa Conservation Area, Ghana. Biological Conservation 165: 86-94. This paper received very wide viewing worldwide, particularly in the first year after publication.

The management plan has been developed for the Ankasa Conservation Area. It was written based on the collaborative Wildlife Policy (2000) and in collaboration with the park management, and the local communities in the Ankasa Conservation Area within six of the nine different Community Resource Management Areas (CREMAs) in the ACA. A cluster of communities within seven Kilometers around the boundary of the Ankasa Park constitutes a CREMA. The CREMAs work with the park management to sustain the resources in and around the park. This management plan set out the objectives for the CREMAs, provided the actions necessary to achieve them, and introduced the framework for decision making by the executive committee members of the CREMAs and other stakeholders. The management plan has been handed over to the park management and the CREMAs leaders to continue with its implementation after the projects completion

Good governance and benefit share arrangements have been developed for PES (REDD) for the stakeholders and CREMA members in the project area. Activities specified under output 3 in the

project document that have been carried out enabled the development of the good governance and benefit share arrangements for PES (REDD). These activities include (i) determine framework for good governance and benefit sharing for REDD, ii) development of best practice guidelines for forest governance, iii) stakeholder consultation to validate best practice guidelines; iv) dissemination of good governance schemes and lessons to stakeholder groups; (v) Inventory and registration of timber trees planted by farmers on farmlands

To determine the framework for good governance and benefit sharing for REDD, surveys, focus group meetings, and community workshops were organized with local communities and related stakeholders in the Ankasa conservation area at different times (Figure 2). At these meetings, issues to bring about good governance in the area for equitable, transparent and effective future REDD+ development and smooth potential benefit sharing were identified, analyzed and discussed The results of these discussions and interactions have been used to produce two important and major scientific paper writing on i) Tenure and carbon rights in local REDD + projects: Insights from community-based workshops in South-western Ghana , ii) Developing decision support system for optimizing benefits of agricultural land use in ACA under a REDD+ regime, Ghana. The first (i) paper was presented as a conference paper at the ROME 2015-SCIENCE SYMPOSIUM ON CLIMATE, jointly organized with the Italian Scientific Societies, from 19-20 November 2015 in Rome, Italy, at the FAO headquarters. This conference paper titled Tenure and carbon rights in local REDD + projects: Insights from community-based workshops in Ankasa Conservation Area, Ghana has been rewritten as a journal paper and submitted for publication.

Figure 2: Map of Ghana showing the study area in ACA: a) Focus group and b) questionnaire survey

The second paper (ii) has been worked on for an MSc thesis in Bio-economy and Natural Resources by a student at the CSIR-FORIG/University of Eastern Finland (CSIR-FORIG campus) programme. The title of this thesis is optimizing land-use under REDD+ regime: a decision support model for farmers in Ankasa Conservation Area (ACA), Ghana. Findings of these detailed studies provide the needed inputs for the best practice guidelines for forest governance schemes for the ACA and the lessons therefore are carried in these publications to the wider readership both local and international.

For instance, the key findings which have relevance for the good governance, management systems and benefit share development are i) agroforestry has been identified as the land-use option available for farmers to optimize benefit under the REDD+ implementation. This was produced from the students thesis. The thesis recommends that farmers in the ACA be sensitized on the significance of agroforestry and they should be supported by providing them with timber tree seedlings to plant in their farms to help address the deforestation and forest degradation and enhance carbon stocks and biodiversity. The key findings in the journal paper are that there need to be adequate education of local stakeholders and communities on REDD+ in ACA, the need for them to undertake land title registration; the need for national carbon rights definition and policy to be formulated and the need for communitys preferences and suggestions to be taken into account.

The tree inventory and registration was necessitated by the issue of tree tenure of these trees that the farmers planted on their farmlands. The tenure became all the more a critical issue because, most of the farmers who planted these trees were migrant farmers. As part of the activities to streamline the tree tenure, the tree inventory and registration exercise was carried out under this project (RED-

PD 026/09 Rev.1 (F)). The target farmers were those who planted or integrated the indigenous timber species on the farmlands with a minimum of fifty (50) standing trees. Plans were made to grow these trees at the beginning of the project. For instance, at the inception of the project, some indigenous timber tree species to be inter-planted in the farmlands (cocoa) of the target farmers and other land-use type were identified through effective participation of the project communities. A central nursery was established in one of the project communities and seedlings of indigenous timber species raised. These timber tree seedlings were distributed to the communities through the structures of the Community Resource Management Area (CREMA) to be planted on their farmlands.

To do the inventory and registration of timber trees on farmlands (Figure 3 4), the district forest manager in Tarkwa who is in charge of forest outside the Ankasa Park was contacted. Through these contacts the rules and regulations guiding the registration of trees planted on farmlands were reviewed for such information to be passed on to farmers. The steps for the registration of such trees were also recorded. To undertake the actual inventory and registration, a cooperation contract was developed and signed between the executing agency represented by the Director and the project team and the Forest Services Division (FSD) represented by the district forest manager that oversees the Ankasa Conservation Area (ACA). This has been necessary, as without it, this registration could not have been done. Even if the project team ignored the FSD team and went ahead, the outcome would not have been accepted or recognized by the FSD as being the case that the farmers actually planted the trees inventoried. Owning to this, the cooperation contract was drafted and all efforts were made to arrive at consensus with the FSD team before it was signed.

The sub activities that were undertaken inorder to register these farmers were i) mobilization and sensitization of target farmers engaged in the tree planting on farmlands under the ITTO REDD project- RED-PD 026/09-The target farmers refer to farmers in communities in a) Navrongo-Tweakor b) Aiyinase-Ayawora, c) Ghana-Nungua Cocoa Town, d) Fia, v) Ohiamadwene-Fiasoro and e) Amokwa CREMAs in the Ankasa conservation area; ii) Consult the traditional authority to seek her consent and advice on the registration exercise; iii) prepare a record of the trees on the various farmlands planted in the six CREMA communities-This provided details of the timber species planted, the names of landowners, farmers and number that did the planting; iv) Prepare a register of the farmers engaged in the tree planting on the farmlands-This highlighted the details of each farmer engaged in the tree planting and it included a form bearing the logo of FC of Ghana; v) Prepare a data collection schedule and collect information on opportunities, challenges remedial measures and lessons learnt for the planting of timber trees on farmlands in the Ankasa conservation by farmers.

Figure 3 4: Tree count and registration of farmers at Navrongo and Nyamebekyere communities in ACA

The significance of the tree inventory and registration was to secure the tree ownership for the farmers who planted the trees, as most of these farmers were migrants. The information on the inventory and registration has been prepared into the benefit share document titled Farmer tree inventory and registration in Ankasa Conservation Area, Ghana. This document has been duly signed by the FSD represented by the District Forest Manager of Tarkwa and the participating farmers who planted the trees on their farmlands. A copy of this document has been submitted to FSD of the Forestry Commission of Ghana. Each participating farmer has also been given a copy of this document-that is the portion of the document relating to the trees encountered on the concerned farmers land.

The information on opportunities, challenges remedial measures and lessons learnt for the planting of

timber trees on farmlands has also been analyzed and a technical report prepared following the 2009 format of ITTO manual for project monitoring, review, reporting and evaluation. The title of the technical report is Tree enumeration and factors affecting integration of trees on-farmlands for REDD policy response in south west Ghana. The main aim of this report was to contribute to the design and policy formulation to support tree planting on farmlands. A journal paper has been prepared from this information titled An analysis of farmers willingness to pay for tree integration on farmlands in Ankasa Conservation Area, Ghana.

The forgoing detailed assessment show that the pre-specified outcome indicator # 1 as presented in the project document has been fully satisfied through delivery of outputs one (1) and three (3). By implication, the specific objective has actually and fully been achieved. Following from this, the achievement of the specific objective has significantly contributed to the objectives of the REDDES programme, namely i) Contribute to the social and economic sustainability of forest-dependent communities; ii) Improved capacities to develop and implement feasible policy options and incentives mechanisms to promote environmental services through sustainable forest management; (iii) Improved livelihoods for forest dwellers and other stakeholders directly involved in the supply of environmental services through the sustainable management of tropical forests; (iv) Improved practices to promote and stimulate community involvement in the supply of environmental services from the sustainable management of tropical forests, and their wide dissemination.

Outcome indicator # 2: Financial value of environmental services estimated

The financial value of the environmental services in the project site (Ankasa Conservation Area) has been determined. This has been done through the implementation of the activities outlined under output 2 in the project document. These activities include (i) Identification of the ecosystem services provided by the conservation area; (ii) Determination of the financial value of these services; (iii) Validation of estimate of financial values of environmental services; and (iv) preparation of final reports with estimates.

An international consultant was hired to do this with the project team. Both biophysical and household survey data were collected in the study area (Figure 5) in order to do this. For the biophysical data collection, sample plots were laid (Figure 5) to collect the data, whilst questionnaire was used to collect the household data in the study area. One technical report titled Economic Valuation of Ecosystem Services of the Ankasa Forest Conservation Area in Wet Tropical Forest Zone of Ghana has been prepared. It followed the ITTO format of project technical report and detailed the problem addressed, the approaches used, the presentation of the data, the analysis and interpretation of the data, results and conclusion. A journal paper has been prepared on the technical report and published as follows: Mefin Tilahun, Lawrence Damnyag, Luke C.N. Anglaaere (2016) The Ankasa Forest Conservation Area of Ghana: ecosystem service values and on-site REDD+ opportunity cost. Forest Policy and Economics 73: 168-176.

This assessment shows that the pre-specified outcome indicator # 2 as presented in the project document has been fully satisfied through delivery of output two (2). By implication, the specific objective has actually and fully been achieved. Following from this, the achievement of the specific objective has significantly contributed to the objectives of the REDDES programme, namely i) enhance adaptation and resilience of tropical forests to negative effects of climate change and human-induced impacts with the objective of quantifying carbon stocks in different land use systems;

(ii) contribute to the social and economic sustainability and well-being of forest-dependent communities by increasing forest values through forest restoration and rehabilitation as well as payments for forest-based environmental services.

Figure 5: Location of the study area and plots locations by land uses.

Outcome indicator # 3: Participatory measurement, assessment, reporting and verification (MARV) methods

The purpose for this indicator was to develop participatory measurement, assessment, reporting, and verification (MARV) methods for forest carbon stocks under output 4 spelt out in the project document. The activities specified in the project documents that have been carried out to achieve this include i) participatory development of verifiable method for forest carbon estimation and monitoring (based on a combination of field surveys and monitoring through satellites images); ii) Determination of baseline carbon stocks; iii) Establishment of baseline of forest cover changes; iv) participatory estimation of emissions reduction and enhancement in sequestered carbon under REDD project scenario; v) Establishment of social baselines and institutions for monitoring REDD; vi) participatory development of reporting and verification methods.

For the participatory development of verifiable method for forest carbon estimation and monitoring and the participatory development of reporting and verification methods, three methodical tools/outputs were produced for use in reporting, verification and monitoring purposes. These include; i) Carbon Maps of the landscape based on results from Carbon Accounting, ii) Model/estimates of carbon for the study area, iii) Monitoring and reporting for carbon stock changes scheme for the Ankasa conservation area

To establish the baselines (carbon stocks and forest cover changes (Figure 6)), 20-year time consistent Landsat images were procured and used for estimating land use conversion and the carbon emission. Field measurement using sample plots were laid representatively all over the land in the project area and biophysical data collected and added to the information obtained from the landsat images to obtain the carbon stocks and forest cover changes. The sample plots established will be used as permanent plots for re-measurement and monitoring of the carbon stock in subsequent years in the study areas. A technical report has been produced on the baseline stock assessment for monitoring purposes. The title of the report is Forest carbon stocks assessment and monitoring in Ankasa conservation area.

Under the participatory development of reporting and verification methods, a community based forest monitoring model has been developed. A technical report on this has been produced. The title is community forest monitoring in REDD+ under MRV in Ankasa Conservation Area, Ghana. For this study, a team of community members were selected in accordance with agreed-upon criteria during community meetings. They were trained about the best practices of monitoring and reporting in 2015 at community meetings. During the community meetings, clear guidelines and standards about how monitoring and reporting should be done were established. These were harmonized across different localities so that the results are comparable at local, national and international levels. In addition, the types of data the communities are willing and able to supply were defined.

Figure 6: Established forest cover change map in Ankasa Conservation Area, Ghana

For the participatory monitoring activities, a check list of forest activities such as fire incidence, logging, farming, collection of fire wood and hunting trails were designed for communities to record and report on. In each area or community that the monitoring meeting and training was held, community members were guided to select a monitoring team that involve, a chairman (leader of the team) and three other members with at least one with the ability to read and write. This monitoring team led the monitoring in the community. Other community members were required to report any sighting of deforestation and forest degradation related activities to this monitoring team to record. The forms were distributed to the monitoring team members in each community that the training was conducted in May 2015. The data collection was done for two weeks following the training in June 2015. The data collection was done simultaneously in all the communities that the schedule forms were distributed. During this time, the monitoring team members and other members in the community report on the form daily, the deforestation and forest degradation related activities they sight in the landscape around their communities in the CREMA areas. The secretary to each of the monitoring team does the entry on the form. Enough of these forms were distributed such that they covered for the two weeks monitoring. In filling one form, the information is continued on a new form if the previous one was full. A total of 22 of the filled forms were collected from the various monitoring teams. The information recorded on the forms was entered in SPSS software and analyzed using descriptive statistics including frequency of sighting of DFD related activities and animals/special biological species. Two-way contingency table analysis was also conducted to evaluate whether statistical relationship exist between CREMAs/locations/communities and frequency of sighting of deforestation and forest degradation related activities in the study area.

The conclusions in the present study are that the CBM offers a tangible explanation for land cover change results obtained through scientific monitoring using remote sensing techniques. Such explanation is otherwise not available with only the remote sensing monitoring method. The results of CBM also raise awareness among community members about the level of DFD in their area and urge them to contribute to address the problem.

Under the establishment of social baselines and institutions for monitoring REDD, these institutions and arrangements for the monitoring REDD+ were evaluated. The method applied was desk study involving a literature review. Field visit was done to identify and evaluate these social baselines and institutions in the study area. The technical report has also been produced from this on Social baselines, institutions and arrangements for monitoring REDD + in Ankasa conservation area, Ghana

The most significant outcomes obtained under this output 4 included the following (i) Map of major land use classes for 3 time periods in Ankasa Conservation area; (ii) Change maps and change of area in size (ha); (iii) Report on the land use conversions in terms of the area content in a matrix form; (iv) Carbon Maps of the landscape based on results from Carbon Accounting Team; (v) Model/estimates of carbon for the study area; (vi) Monitoring and reporting for carbon stock changes scheme for the Ankasa conservation area; and (vii) Established social baseline and institutions for Monitoring REDD+ in ACA

The assessment that has been done as detailed in the preceding section shows that the pre-specified

outcome indicator # 3 as presented in the project document has been fully satisfied through delivery of output four (4). As a result, the specific objective has actually and fully been achieved. Following from this, the achievement of the specific objective has contributed to the objectives of the REDDES programme, namely i) enhance adaptation and resilience of tropical forests to negative effects of climate change and human-induced impacts with the objective of quantifying carbon stocks in different land use systems; (ii) Maintain and enhance climate change mitigation and other environmental services of tropical forests.

Outcome indicator # 4:Capacities of local communities built in management systems and MARV

Five capacity building programmes were developed and carried out to build the capacity of the local communities in the management systems and the MARV. These were i) seedlings production and planting on farmlands under output 3; ii) training on carbon stock assessment, iii) training on community based forest monitoring under output 4, iv) training on alternative livelihoods and v) education on REDD+ policy. To let community undertake the tree planting on the farmlands, a group of the community members were trained on the timber tree seedling production. This group was supplied with the seeds to produce the seedlings (Figure 7 8). The participating farmers were trained on how to plant these seedlings. The seedlings were lifted from the nursery and distributed to the individual farmers to send to their farms to plant.

Figure 7 8: Seedlings production in central community nursery in Ankasa Conservation Area, Ghana

Alternative livelihood supports were delivered to the participating farmers in the project. These included fish farming, beekeeping and livestock rearing. To enable target farmers operationalize these livelihood supports and benefit from them, their capacities were built. One of these was the sheep livelihood support programme. Participating farmers were trained on sheep rearing and the pens constructed and stocked with the sheep for them to rear (Figure 9 10).

Figure 9 10: Pen stocked with sheep for Ghana Nungua Cocao Town CREMA in Ankasa Conservation Area, Ghana

For the carbon stock assessment, communities were also trained to do that (Fig 11 12). The training was organised in the classroom setting where the basics were explained to them. They were then sent to the field where demonstrations were done and they were guided to do the measurements themselves.

Figure 11 12: capacity building in carbon stock assessment of local communities in Navrongo-Tweakor CREMA, Ankasa, Ghana

For the development of the participatory reporting and verification methods, participating communities were trained on the identification of deforestation and forest degradation related incidences in the landscape at community workshops (Fig 13 14). The groups of community members nominated to record these forest related disturbances were also trained on how to record these on a schedule that was designed and copies distributed to them.

Figure 13 14: Training on identification of deforestation related disturbances using the land cover

change map of ACA for CREMA members, Ghana

Capacity building on REDD and identification of stakeholders in the Ankasa Conservation area was also conducted for local communities in the project (figure 15  16). The purpose of this was to educate the communities on the importance of the emerging international forest policy (REDD) and its objective to reduce emissions from deforestation and forest degradation, enhance carbon stocks and conserve forest. They were also educated on the compensation package associated with REDD+ through the carbon offset market.

Figure 1516: eduction on REDD+ and stakeholder identification in Ankasa Conservation Area, Ghana

As demonstrated in the assessment detailed in the preceding section, the pre-specified outcome indicator # 4  as presented in the project document has been fully satisfied through delivery of output four (4), one (1) and three (3). From this assessment, the specific objective has actually and fully been achieved. Following from this, the achievement of the specific objective has contributed to the objectives of the REDDES programme, namely i) enhance adaptation and resilience of tropical forests to negative effects of climate change and human-induced impacts with the objective of quantifying carbon stocks in different land use systems; (ii) maintain and enhance climate change mitigation and other environmental services of tropical forests; iii) contribute to the social and economic sustainability of forest-dependent communities; iv) improve capacities to develop and implement feasible policy options and incentives mechanisms to promote environmental services through sustainable forest management; (v) improve livelihoods for forest dwellers and other stakeholders directly involved in the supply of environmental services through the sustainable management of tropical forests; (vi) improve practices to promote and stimulate community involvement in the supply of environmental services from the sustainable management of tropical forests, and their wide dissemination.

4.2 Existing situation at project completion vs pre-project situation

The tangible outcomes of the project are;

i) Techniques, strategies and governance lessons for engaging local communities to integrate trees on farmlands (cocoa) outside forest reserves have been developed. These have been achieved through capacity building of communities on alternative livelihood programmes; nursery establishment; tree planting on farmlands; facilitating the inventory and registering the trees planted and farmers involved; tree registrations document handed over to the communities with copies to the relevant authorities; and study of the process with recommendations formulated for improvement.

ii) Over 8,766 of the planted trees involving different species have been enumerated. Over 129 farmers consisting 84% male and 16% female who planted these trees were surveyed and the opportunities, silvicultural and governance challenges and remedial measures for addressing the challenges obtained and handed over to the relevant authorities including Forestry Commission of Ghana (Forest Services Division, Wildlife Division and REDD Secretariat of Ghana). These provide Lessons on mainstreaming REDD activities into SFM, because they will enhance forest carbon stocks and improve biodiversity, watershed conditions and other environmental services although it is conditional on the sustainability and management of the trees planted.

iii) The economic value and REDD opportunity cost of forest resources of the project area have been estimated. The causes for the deforestation and forest degradation in the project area have also been

identified. These have been done through detailed studies which have been published in two very high impact factor international journals. These papers have formulated key policy implications and recommendations to improve the REDD in the project area and in similar areas inside and outside the country. In addition to these, one other study completed on tenure and carbon rights in local REDD project provides lessons on forest resources governance and benefit sharing arrangement for REDD in the country. This study was presented as a conference paper in Rome 2015-Science Symposium on climate, 19-20 November, 2015. It contributed to the overall objective of the symposium which was to address the advances in Climate Sciences, Adaptation and Climate Impacts, Mitigation strategies.

iv) Methodologies on Measurement, Assessment, Reporting and Verification have been developed using data collected in the project site. These methods have been applied i) to produce the land cover change maps in the project area; ii) to produce baseline carbon stock in the project area; iii) to produce a technical report on community-based forest monitoring of REDD+ data collection, analysis and reporting in the project area. These provide technical lessons for the development of overall national REDD strategy for Ghana.

v) Management plan has been developed to add to what the Ankasa park management from the Wildlife Division already has. This plan is particularly targeted at the management of the CREMAs outside the Ankasa Park. The relevant stakeholders have also been identified through a detailed stakeholder analysis study done in the project area. The report is meant to enable the park management to draw on these relevant stakeholders to ensure the sustainable management of the area

4.3 Involvement of project beneficiaries

The primary beneficiaries of the project are the local communities in the CREMAs, the park management from the Wildlife Division and Forest Services Division of the Forestry Commission of Ghana. Their involvement is summarized as follows

The local communities participated in the implementation of the activities of the project. They were involved in all the capacity building and education programmes, seedlings productions, seedlings planting and maintaining planted trees, survey data collection by responding to questionnaire and participating in focus group discussions, monitoring deforestation and forest degradation related activities in the landscape in the project area. They were also involved in the project steering committee meetings and project monitoring missions undertaken by ITTO

Park management of the ACA was involved in almost all project activities implementation. These include the survey data collection, focus group discussion, distribution of seedlings to farmers, training and education of farmers on REDD and stakeholder identification, farmer tree inventory and farmer registration. The park management were also involved in project steering committee meetings

The FSD staff were involved in the project through the tree inventory and registration of farmers, documenting these registration and keeping safe to be used in future to ensure farmers get their share of the timber proceeds

4.4 Project sustainability after completion

The executing agency has worked very hard to realize all the activities specified in the project document. These have been done through detailed studies, stakeholder analysis, seedlings

production, distribution, planting and registration of the trees planted for the farmers, development of management plan, measurement, assessment, reporting and verification methodology development and capacity building of the local communities in the project area. These have been done in close collaboration with the relevant stakeholders in the country including the local communities, Forestry Commission of Ghana (Wildlife Division, Forest Services Division and REDD Secretariat), the Ministry of Food and Agriculture, District Authority and the administration of stood land authority.

To continue with outputs of the project,

i) the Park management of the Wildlife Division of the Forestry Commission of Ghana, will continue to work with members of CREMAs with the implementation of the management plan developed particularly for the local communities

ii) The district assembly/authority of project area is also to offer CREMAs with support both financial and logistics for their activities that include the project activities

iii) The FSD and the park management are also to continue to support the project farmers and other communities with the planting and maintenance of the trees on farmlands. This support is to be related to seeds and seedling acquisition by farmers for the planting including securing tenure security (registration for the farmers) and education on good silvicultural practices

iv) The community forest monitoring technique developed for the monitoring of DFD in the project area and the associated results of the community monitoring are to be taken up by national REDD+ secretariat of Ghana, the FSD and the park management. These would be used for the development and implementation of the emission reduction plan of Ghana

v) The agricultural extension officers of the MOFA are also to continue to offer support to the farmers relating to the sheep livelihood and agroforestry activities in the project area

vi) Continued publication and dissemination of the research results of the project is being done by the executing agency and its collaborators to ensure replications and scaling up of research to address DFD in and outside Ghana.

## Assessment and Analysis:

5.2 Project rationale and identification process

The Ankasa national park is the site where the activities of the project have been implemented. The cluster of communities within 7km to the boundary of the park has been organized into nine (9) community resources management areas (CREMAs). These CREMAs are distributed around the western, southern, eastern and northern parts of the park. The purpose of these CREMAs is to support the Ankasa park management to sustainably manage the park both inside and outside. The unstainable management of the park by these two stakeholders leading to higher deforestation and forest degradation, and increased CO2 emission led to the identification, development and implementation of this project. The identification of the project was done in detail. It involved stakeholders before and during the implementation of the project. The identification process coincided with the operation of CREMAs in the protected areas and the development of national REDD policy in the country. As a result, understanding on the issues to be tackled by the project was in-depth, while the issues addressed were relevant and consistent to the need of the local communities in the CREMAs, Wildlife Division of the Forestry Commission of Ghana and the national REDD secretariat.

5.2 Problem addressed, objectives and implementation strategy

## Assessment and Analysis:

The Ankasa national park, which is the study area of the project, has the highest biological diversity of any place in Ghana, with over 300 different plant species recorded in a single hectare. According to Birdlife International (2009), Ankasa is considered to be the 'hottest' forest in Ghana. The Ankasa national park contains one of the few remaining blocks of relatively untouched forest in the country. This, plus the faunal diversity of the site, makes the area one of the most important sites for conservation of forest biodiversity in Ghana. Animal life includes the elephant, bongo, chimpanzee, Diana monkey, and 263 species of birds. However due to encroachment of local communities for unsustainable shifting cultivation for both food and cash crops, the park is being over-exploited leading to a lot of deforestation and degradation. The impact of this is that there has been a reduced supply of forest products which the local communities depend. There have also been increased CO2 emissions, loss of biodiversity and reduction of water quality and supply and increased soil erosion.

Following from this, the key problem addressed was the unstainable conservation of the Ankasa National Park leading to deforestation and forest degradation and increased carbon emissions. The specific objective was to develop and implement participatory, good governance and management system for the Ankasa conservation area, methods for measurement, assessment reporting and verification (MARV) for forest carbon as well as estimation of the value of environmental services. The development objective was to contribute to sustainable management and conservation of Ankasa Conservation area to improve the provision of environmental services and reduce GHG emissions from deforestation and degradation as well as enhance carbon stocks in tropical forests.

The strategy applied in implementing the project was participatory and collaborative in nature with the following project elements

Output 1: Participatory management system developed and implemented

Identify management system of areas surrounding conservation area

Identify relevant local stakeholders

Undertake strategic analysis of the drivers of forest degradation and deforestation in the Conservation area

Participatory develop management system

Implement developed system

Evaluate and review management system

Output 2: Financial value of the environmental services provided by the conservation area determined

Identify the ecosystem services provided by the Conservation area

Determine the financial value of these services

Validate the estimates of the financial values

Prepare final report with estimates

Output 3: Governance and benefit sharing arrangements PES developed

Develop framework for good governance and benefit sharing for REDD

Develop best practice guidelines for forest governance

Undertake stakeholder consultation to validate best practice guidelines and framework for good governance and benefit sharing

Disseminate good practice schemes and lessons to stakeholder groups

Output 4: Participatory methods for measurement, assessment reporting and verification (MARV) of forest carbon developed and implemented

Develop verifiable method for forest carbon estimation and monitoring in a participative manner

Determine baseline carbon stocks

Establish baselines forest cover changes

Estimate emissions reduction and enhancement in sequestered carbon under REDD project scenario in a participatory manner

Establish social baselines and institutions for monitoring REDD

Develop reporting and verification methods in participatory manner

5.3 Critical differences between planned and actual project implementation

As indicated in section 3, no change has been made to the development objective, specific objective and the outputs. Most of the planned activities were unchanged. The only additional activity was inserted under output 3. The additional activity that leads to the modification was activity 3.5: Inventory and registration of timber trees planted by farmers on farmlands. The addition of this activity came as a request from the farmers in the project site. The request was discussed and endorsed at the project steering committee meeting. From the forgoing, the difference between the planned and actual project implementation was not significant. The little addition improved the projects outcomes and sustainability

5.4 Adequacy of time and project inputs

The project was implemented according to the planned schedule. The project duration was initially planned for 48 months. It started in April 2010 and ended in December 2015. The actual duration was extended for 9 months to enable the successful execution of the project activities, particularly the additional activity that had to do with the inventory and registering of farmers and their trees planted on the farmlands

The total expenditure of the project was US$ 656614. Out of this, US$101692 was the expended amount from the GOG contribution and US$554922 from the ITTO contribution. For the ITTO contribution, the amount was received in seven installments and spent accordingly on the execution of the projects activities. All payment of the installments was done timely and the amounts spent on the specified project activities.

5.5 External influences

The assumptions made concerning the implementation of the project were valid during the duration of project implementation. For instance, the aim of the project was to empower local communities to participate in the management and governance of the Ankasa National Park in order to achieve its prime aim of provision of environmental services. It was assumed that the major stakeholders the park management on one hand and the local communities on other hand would not cooperate to bring about the achievement of this objective because conflict regarding the use of the goods and services was anticipated to arise between these two major stakeholders that manage the Ankasa Park.

The measures of mitigation outlined in the project document were effective in minimizing this conflict in most cases during the duration of the project. The local communities undertook the activities of the project on the field, regarding attendance on capacity building training, application of skills and knowledge acquired in the sustainable management of the national park, particularly areas outside the park termed the CREMAs. The Ankasa Park Management on its part mobilized local communities

to undertake the project activities. For instance, the park management supported local communities with the distribution of seedlings for planting on their farmlands, assisted them to register these trees with the relevant authority and helped train and build their capacity in various areas including stakeholder analysis, identification of deforestation and forest degradation related incidences, and REDD architecture and payment for environmental services (PES). The two stakeholders work together to implement the management plan developed for the area.

5.6 Project beneficiaries

The primary beneficiaries were the local communities within the CREMA, the Ankasa Park Management from the Wildlife Division, and the Forestry Services Division. Each of these was actively involved in the project implementation.

The local communities did the field work relating to planting and maintaining of trees on their farmlands, upkeep of livelihood support programs, participation in capacity building trainings and application of these skills and knowledge in the sustainable management of the landscape in the project area.

The staff of the WID represented by the Ankasa Park management also contributed to the projects implementation. They mobilized local communities to implement project activities, participate in different studies of the project, e.g. socioeconomic and biophysical data collection, training workshops and steering committee meetings

The other beneficiaries included the traditional authority that supported the tree planting on their lands, the FSD that manages timber trees in and outside forest reserves in Ghana, the Ministry of Food and Agriculture represented by their extension staff on the field with the farmers. The District Assemblies (Local government authority) from the Administrative districts of the project area are in charge of the overall development of the districts, relating to construction of access roads to project sites among others. The National REDD Secretariat of the Forestry Commission of Ghana in charge of development of emission reductions plan and the national REDD architecture. It makes use of the results and findings developed from the project

5.7 Sustainability

The inventory and the registration of farmers and their trees planted on the farmlands that have been done under this project have raised the interest of farmers in this activity. A lot more farmers in and outside the project communities have shown interest in this exercise and are requesting for timber tree seedlings to plant. The request for the tree seedlings was made at the project internal evaluation meeting by farmers. The FSD, MOFA and the Wildlife Division represented by the Ankasa Park Management, are to fill this gap by supporting farmers with the tree seedlings to sustain this activity through the Forest Investment Programme (FIP) under the Forestry Commission of Ghana (FC).

In developing the methods for the Measurement, Assessment, Reporting and Verification (MARV) under this project, sample plots for biophysical data collections have been laid, baseline land cover change maps have been produced, the baseline carbon stocks of the project site have been produced, community monitoring schedule have been drawn and communities trained on monitoring deforestation and forest degradation related activities and pilot community-based forest monitoring data collected and report produced. These are important methods, technologies, strategies and

information obtained from the project that are relevant for monitoring deforestation and forest degradation, and carbon emission reduction activities in and outside the project sites. The national REDD secretariat supported by the Ankasa Park Management of the WID and FSD would make use of these in the development of emission reduction plans for Ghana. They will make use of these to monitor the deforestation and forest degradation, and the carbon stock in and outside the project area to validate the national carbon emission reductions strategies and designs

In order to consolidate the developed methodologies, technologies, strategies, livelihood support programs and research findings obtained from the project and sustain the tree planting interest among and outside the project farmers, a second phase of this project would be very useful in this direction. Whilst aiming to consolidate the activities of the first phase, the second phase project should aim at scaling up the activities, helping to address remaining problems in the study area including the land title registration, and supporting the development of national emission reduction plan including national carbon right policy. At the projects internal evaluation meeting that marked the close of the project, the local communities in the project made these requests. Among other things at this project internal evaluation meeting, they requested that they are supported to do their land title registration to harmonize the land acquisition process particularly for the agroforestry activities in the area. The local communities noted that this land title registration was necessary because land tenure has become a big issue in the main project district (Jomoro) and it is creating problems for the landowners, farmers and the trees grown on farmlands.

5.8 The institutions involved

The institutions involved in the project implementation were;

The local communities and their roles and responsibilities were the implementation of project activities on the field relating to agroforestry.

The staff of the WID represented by the Ankasa Park management also contributed in the project implementation. Their role and responsibilities were also appropriate and they performed them satisfactorily.

The other institutions involved in the project included the traditional authority that supported the tree planting on their lands, the FSD that manages timber trees in and outside forest reserves in Ghana, the Ministry of Food and Agriculture represented by their extension staff on the field with the farmers.

The District Assemblies (Local government authority) from the Administrative districts of the project area also had a role to play in terms of the overall development of the districts including project areas.

## Lessons Learned:

6.1 Project identification and design matters

The creation of Community Resource Management Areas (CREMAs) in protected areas, particularly in the Ankasa Conservation Area, which is the study site of the project, has been useful in addressing the conservation challenges in these protected areas. The project was timely initiated to help the local communities in these CREMAs and the Park management in their task of addressing the conservation challenges in this area.

The partnership between the local communities and the park management within the CREMA structure, apart from being a useful arrangement in ensuring the sustainable management of the ACA, was also a very helpful medium in the identification process, development and implementation of this project. Within the CREMA structure, the key problem of the project was thoroughly analyzed in

collaboration with these two main stakeholders. The main and sub causes of the problem to be addressed were identified. The effects of this problem were also identified including the impacts. Following from this, thorough identification of the activities of the project was done to coincide with the sub causes. The main outputs were identified to coincide with the main causes and the specific objective identified to coincide with the key problem. The specific objective was carefully identified to contribute to the development objective of the project. The project design was very sound because, there were sufficient interventions including the outputs and corresponding activities to address the problem. To ensure sustainability of the project after completion, a sustainability plan was designed earlier, and presented to the project stakeholders at the internal evaluation workshop. Areas for actions to be taken to ensure the sustainability were outlined and responsible stakeholders identified to take up these actions to ensure sustainability.

6.2 Operational matters

The executing agency of this project was the CSIR-Forestry Research Institute of Ghana (FORIG). The implementation of the project was participatory. The main collaborators were the local communities in the different CREMAs in the ACA, and the Wildlife Division of the Forestry Commission of Ghana represented by the Park Manager and the technical staff at the ACA. The academic institutions Kwame Nkrumah University of Science and Technology (KNUST), The Forest Service Division of the Forestry Commission of Ghana, ITTO secretariat, the traditional authority, the local government authority (District Assembly) and the Ministry of Food and Agriculture of the project districts all collaborated. Their active collaboration and participation in project implementation ensured the smooth operation of the project.

The roles and responsibilities of these collaborators were spelt out at the beginning of the implementation of each specific activity of the project. This avoided confusion in the project implementation. Project documentation was carefully done. Technical reports were written following the guidelines of ITTO and other journal papers thoroughly written and published in Journals with high international reputations.

Monitoring and evaluations have been held satisfactorily, within the PSC meetings, chaired by the Director of the Forestry Research Institute of Ghana and the project coordinator. Five to six of these PSC meetings have been held. These meetings have always been attended by members of the PSC to provide important guidance for the project operations

Working with local communities on field activities associated with their livelihood and environment is a special exercise that requires special attention and understanding of the needs of these communities to be successful. The field monitoring by ITTO and the executing agency contributed significantly to the successful implementation of the planned project activities. During those monitoring exercises, challenges associated with the implementation of the project were identified earlier and addressed, local communities encouraged to continue to work on the project and their needs related to the project were also identified and addressed. For instance, it was during these monitoring exercises that the activity on the inventory and registration of the farmers and the trees planted on the farmlands was identified and carried out.

The inputs of the project were timely transferred to the executing agency based on the submission of the yearly plan of operations and one sustainability plan to ITTO secretariat. The funds transfer which

was sufficient in quantity and quality was done in seven installments.

## Conclusions and Recommendations:

7.1 Conclusions

The partnership between the local communities and the Park Management within the CREMA structure that work for the sustainable management of the ACA was a very important arrangement used in the identification, development and implementation of this project.

The key problem of the project was thoroughly analyzed in collaboration with the stakeholders and the main and sub causes were related to the problem addressed.

The project design was very sound because, there were sufficient interventions including the outputs and corresponding activities to address the problem.

The project implementation was smoothly done largely because of the participatory strategy applied. The key sources of this smooth implementation were the cooperation between local communities and different collaborators, the dedicated project management team, the able PSC and the helpful and cooperative support from ITTO secretariat

The needs, concerns and suggestions of the local communities, who were the primary beneficiaries were duly considered at every stage of the projects implementation

The project was managed in full compliance with existing ITTO rules and procedures. Employment of project personnel, national and international consultants as well as procurement of capital items were made based largely on approval of ITTO.

The specific objective of the project has been fully achieved through delivery of all planned outputs and execution of the activities pertaining to individual outputs

The project results have been disseminated through the meetings of the PSC, project internal evaluation workshop, publications in international and domestic journals and presentations at international conferences.

7.2 Recommendations

The key problem to be addressed by a proposed project must be adequately analyzed in the best way that correctly identify relevant main-causes and sub-causes of the problem as the basis for defining relevant project elements and intervention.

In achieving the soundness of a project design, it should be closely linked with adequacy of problem analysis

Roles and responsibility of the stakeholders need to be identified and assigned prior to the implementation of each activity of the project. This helps to forestall any risk and confusion and brings about smooth implementation of the project

It is advisable to put together, a well dedicated project management team, ensure timely availability of inputs in terms of funds and establish PSC to provide good counsel to project management team

It is also advisable a project is implemented in a participatory manner. This will engage the stakeholders and help create ownership and increase support to the project during its implementation and after completion.

It is recommended a sustainability plan be drawn and discussed with the project stakeholders and partners. So that actions and programs to be taken to ensure sustainability of the project after completion are identified during these discussion sessions and the responsible institutions identified to make follow up on these actions and programs

## Conclusions and Recommendations:

Field monitoring by ITTO and the executing agency is required to ensure the successful implementation of the planned project activities. During those monitoring exercises, challenges associated with the implementation of the project need to be identified and addressed, local communities encouraged to continue to work on the project and their needs related to the project also identified and addressed.

A second phase of this project is recommended. Whilst aiming to consolidate the activities of the first phase, the second phase project should aim at scaling up the activities, helping to address remaining problems in the study area including the land title harmonization, and supporting the development of national emission reduction plan including national carbon right policy.

Responsible for the Report

Name: Lawrence Damnyag  Position held: Project Coordinator

Signed:

Date: July 2016

# Annexes

# Completion report

# ITTO project RED-PD 026/09 Rev.1 (F)

# Reducing emissions from deforestation and forest degradation through collaborative management with local communities

Host Government:

The Government of Ghana

Executing agency:

CSIR-Forestry Research Institute of Ghana

| | |
|---|---|
| Project number: | ITTO project RED-PD 026/09 Rev.1 (F) |
| Project title: | Reducing emissions from deforestation and forest degradation through collaborative management with local communities |
| Starting date: | April 2010 |
| Duration of project: | 48 months |
| Project cost: | Total US$ 760,408<br>ITTO US$658,716<br>Government of Ghana : US$101,692 |
| Report type: | Completion report |
| Project staff: | |
| Project Coordinator and Forest Economist | Lawrence Damnyag (PhD), e-mail:ldamnyag@yahoo.com |
| Agroforestry expert | Luke C.N. Anglaaere (PhD) |
| GIS and remote sensing expert | Mr. Francis Dwomoh/Yakubu Mohammed |
| Technician | Emmanuel Antwi Bawuah |
| Technician | Francis Tease |
| Technician | Jonathan Dabo |
| Executing agency: | CSIR-Forestry Research Institute of Ghana,<br>University, P.O. Box 63, KNUST-Kumasi, Ghana<br>Tel:+233-03220-60122<br>Fax: +233-03220-60121<br>Email: director@csir-forig.org.gh |
| Place and date of issue: | Kumasi, July 2016 |

Disclaimer:

The views expressed in this report are those of the authors and do not necessarily reflect the views of ITTO or the Government of Ghana. The materials contained here are based on the authors' knowledge of the subject and how they can contribute to the sustainable management of the Ankasa Conservation Area and similar project sites in and outside Ghana

**Acknowledgement**

We are thankful to the Donors through ITTO for providing the financial support for execution of this project. Staff of ITTO through the Executive Director is thanked for working to bring this project to a successful end. Mr. MASUPA Kambale of the ITTO is particularly thanked for the field monitoring and guidance in the implementation of this project. The local communities have particularly noted the usefulness of the field monitoring as one exercise that boosted their morals and urged them on during the implementation of the project. The collaborators of this project particularly the Wildlife Division of the Forestry Commission represented by Mr. Cletus Balangtaa and his technical staff at the Ankasa Park are thanked for their efforts, cooperation and contribution in the execution of the project. We would like to acknowledge the contribution of Dr. Dominic Blay to the development and implementation of this project. He passed away during the last lap of the project's implementation and could not live to see and contribute to the writing of this completion report as the coordinator.

**List of abbreviations and acronyms**

| | |
|---|---|
| ACA | Ankasa Conservation Area |
| CBM | Community Based Monitoring |
| $CO_2$ | Carbon dioxide |
| CREMA | Community Resource Management Area |
| CSIR | Council for Scientific and Industrial Research |
| FCPF | Forest Carbon Partnership Facility |
| FIP | Forest Investment Programme |
| FORIG | Forestry Research Institute of Ghana |
| FSD | Forest Services Division |
| GHG | Green House Gas |
| GIS | Geographic Information System |
| GOG | Government of Ghana |
| INDC | Intended Nationally Determined Contribution |
| ITTO | International Tropical Timber Organization |
| MARV | Measurement, Assessment, Reporting and Verification |
| MOFA | Ministry of Food and Agriculture |
| NTFP | Non-Timber Forest Product |
| PSC | Project Steering Committee |
| REDD | Reducing Emissions from Deforestation and Forest Degradation |
| SFM | Sustainable Forest Management |
| SPSS | Statistical Package for Social Scientist |
| WID | Wildlife Division |

## Contents

**Executive summary**

The Ankasa conservation area which is the study area of the project is surrounded by a number of communities. By virtue of proximity to this area, communities depend on it for their livelihood.

This project originated from a study made on flora, fauna and habitat assessment of the community Resource Management Areas (CREMAs) surrounding the Ankasa Conservation Area.The key problem addressed was the unsustainable conservation of the Ankasa National Park that leads to deforestation and forest degradation and increased carbon emissions in the area.

The development objective of the project was to contribute to sustainable management and conservation of Ankasa Conservation Area to improve the provision of environmental services and reduce GHG emissions from deforestation and degradation as well as enhance carbon stocks.

The specific objective was to develop and implement participatory, good governance and management system for the Ankasa conservation area, methods for measurement, assessment reporting and verification (MARV) for forest carbon as well as estimation of the value of environmental services.

The strategies used in the project's implementation include i) Participatory management of the Conservation Area: ii) Enhancement of biodiversity and carbon stocks, as well as reduction of emissions iii) Awareness and knowledge on REDD at local and regional level; iv) Community participation in forest conservation, monitoring of illegal logging and forest encroachment; iv) Governance and benefit sharing arrangements for REDD development, and REDD concept mainstreamed within SFM activities; v) Verifiable method for carbon accounting and monitoring development; vi) Baseline emissions and potential carbon credit under REDD project scenario determination.

One activity was added during the project's implementation. This was done at the project steering committee meeting with approval from ITTO. The planned specific objective, outputs and associated activities did not change and have all been completed within schedule but with extension of additional 9 months with no extra budget from ITTO.

Techniques, strategies and governance lessons for engaging local communities to integrate trees on farmlands (cocoa) outside forest reserves have been developed; economic value and REDD opportunity cost of forest resources of the project area have been estimated; and methodologies on measurement, assessment, reporting and verification have been developed using data collected in the project site. These have provided better understanding of DFD and $CO_2$ emissions in the study area. These strategies and methods also provide measures to help address the DFD and improve environmental conditions in the study area before the project implementation.

The primary beneficiaries including the local communities and the park management have been involved in the development of the strategies, methods and measures. In this way their capacities have been built and it would be easier for them to continue with project interventions with some support from the other stakeholders because they own these strategies and methods.

The inventory and the registration of farmers and their trees planted on the farmlands that have been done under this project have raised the interest of farmers in this activity. A lot more farmers in and outside the project communities have shown interest in this exercise and are requesting for timber tree seedlings to plant. This will facilitate the reduction of DFD, and enhance carbon stocks in the study area.

In developing the methods for the Measurement, Assessment, Reporting and Verification (MARV) under this project, sample plots for biophysical data collections have been laid, baseline land cover change maps have been produced, the baseline carbon stocks of the project site have been produced, community monitoring schedule have been drawn and communities trained on monitoring DFD related activities and pilot community-based forest monitoring data collected and report produced. These are important information obtained from the project that is relevant for monitoring DFD, and carbon emission reduction activities in and outside the project sites.

The partnership between the local communities and the park management within the CREMA structure was also a very helpful medium that assisted the identification process, development and implementation of this project. Within the CREMA structure, the key problem of the project was thoroughly analyzed in collaboration with the key stakeholders. This enabled project design to be very sound because, there were sufficient interventions including the outputs and corresponding activities to address the problem.

The implementation of the project was participatory. The active collaboration and participation of the partners and stakeholders of project ensured its smooth operation. Further, the field monitoring by ITTO and the executing agency contributed significantly to the successful implementation of the planned project activities.

The key problem to be addressed by a proposed project must be adequately analyzed in the best way that correctly identifies relevant main-causes and sub-causes of the problem as the basis for defining relevant project elements and interventions. Further, to achieve the soundness of a project design, it should be closely linked with adequacy of problem analysis

Roles and responsibility of the stakeholders need to be identified and assigned prior to the implementation of each activity of the project. This helps to forestall any risk and confusion and bring about smooth implementation of the project

It is advisable to put together, a well dedicated project management team, ensure timely availability of inputs in terms of funds and establish PSC to provide good counsel to project management team. Further, a project is to be implemented in a participatory manner. This will engage the stakeholders and help create ownership and increase support to the project during its implementation and after completion.

It is recommended that a sustainability plan be drawn and discussed with the project stakeholders and partners. This ensures that actions and programs to be taken to ensure sustainability of the project after completion are identified at these discussion sessions and the responsible institutions identified to make follow up on these actions and programs.

Field monitoring by ITTO and the executing agency is required to ensure the successful implementation of the planned project activities. During these monitoring exercises, challenges associated with the implementation of the project need to be identified and addressed, primary beneficiaries (e.g. local communities) encouraged to continue to work on the project and their needs related to the project also identified and addressed.

## 1. Project identification

### 1.1 Context

The mainstay of the Jomoro District, which is the main study district of the project, is subsistence farming and petty commerce with coconut farming dominating. Land for farming in the district is acquired mainly through the share cropping system. The economy of this district is mixed, consisting of large traditional agricultural sector made up of mostly small-scale peasant farmers.

The Ankasa Conservation Area which is the study area of the project is surrounded by a number of communities. By virtue of proximity to this area the communities depend on it for their livelihood. Ankasa Resource Reserve and the contiguous Nini-Suhien National Park that comprise the ACA as the project site are Wildlife Protected Areas located in the wet evergreen forest area of the South-Western Region of Ghana.The Ankasa Conversation Area is about 365 kilometers west of Accra near the border with Côte d'Ivoire. The park is approximately 500 square kilometers, and consists largely of tropical evergreen rainforest. The study area is the wettest part of the country with average annual rainfall more than 1732mm.

This project is relevant to the National Forest and Wildlife Policy (2012) which has among its objectives, the management of the existing forest estate for sustainability of timber and non-timber resources, expansion of the nation's forest cover for increased yields of domestic and industrial products, rehabilitation of denuded lands, protection of water catchments and stream banks and enhancement of the natural environment.

Further, this project contributes to national and regional programs including: i) the Forest investment programme (FIP); ii) the National Forest Plantation Development Programme; iii) Two Concession Agreements approved and signed for implementation with two private investors, namely Eco-lodges Ghana Limited and Black Star Eco-City Limited, for ecotourism investment in Mole, Kakum and Ankasa Conservation Areas; iv) Japanese Government grant of US$7.8 million to the Government of Ghana under the Forest Preservation Programme (FPP) for capacity building in Geographical Information System (GIS) that will enable Ghana access benefits from Reducing Emission, Degradation and Deforestation (REDD+) and other emerging financial mechanisms; v) Ghana REDD+ Readiness Preparatory Proposal (R-PP) which outlines the process by which the Government of Ghana will develop its national REDD+ strategy and to adopt interventions or options to address drivers of DFD in the country; and v) Ghana's Intended Nationally Determined Contribution (INDC)

### 1.2 Origin and problem

This project originated from a study made on floral, fauna and habitat assessment of the community Resource Management Areas (CREMAs) surrounding the Ankasa Conservation Area. During this study the local communities acknowledged that although the Park was of very much relevant, they were not involved in the management of the area. They also complained that the park doesn't help them with their livelihood thus they undertake illegal activities to support their livelihood. It was agreed that there was some vegetation change which they thought was due to the change in the weather patterns but were not aware of climate change. During the debriefing session at the end of the study, it was proposed that the research team look at how to get communities involved in the management and also to improve their livelihood. Therefore, when the call for proposal on ITTO's thematic programme on Reducing Deforestation and Forest Degradation and Enhancing Environmental Services in Tropical Forests (REDDES), was made, this proposal was developed and discussed with the local communities who gave their approval.

The Ankasa conservation area is the project site for this ITTO project. The forest has the most biological diversity of any in Ghana, with over 300 different plant species recorded in a single hectare. Ankasa is considered to be the 'hottest' forest in Ghana; it contains one of the few remaining blocks of relatively untouched forest in the country. This, in addition to the faunal diversity of the site, makes the area one of

the most important sites for conservation of forest biodiversity in Ghana. However, due to encroachment of the park by local communities for unsustainable shifting cultivation for food and cash crops as well as illegal logging in and around the park, the park is being over-exploited leading to a lot of DFD. The impact of this is that there is reduced supply of forest products which the local communities depend on. There are also increased $CO_2$ emissions, loss of biodiversity and reduced water quality and supply, increased soil erosion. All these have resulted in the poor conservation of this area leading to continued deforestation and degradation.

These effects aggravate the poverty of already poor people in the area, deteriorate livelihoods and lead to displacement of people to urban centers such as Takoradi, Accra and other places. It leads to conflicts among the different villages around the park over the forest resources which they depend on for their livelihoods. Following from this, it is imperative that management of the Ankasa Conservation Area (park) aimed to conserve biodiversity, provide ecosystem services, including reducing emissions and enhancing carbon stocks in order to mitigate climate change as well as maintain the livelihood of the local communities. However these aims are not being achieved because of i) Inadequate involvement of local communities in the planning & management of the conservation area; ii) lack of information on the financial worth of ecosystem services provided by the conservation area; iii) lack of good governance and benefit sharing arrangements and PES; and iv) local communities do not have the capacity for monitoring REDD & lack of standard methodologies for local communities' participation in monitoring REDD.

## 2. Project objectives and implementation strategy

### 2.1 Rationale

Due to encroachment of the ACA by local communities for unsustainable shifting cultivation for food and cash crops as well as illegal logging in and around the park, the park is being over-exploited leading to a lot of deforestation and degradation. Recent studies by CARE international of the park indicates that there has been significant reduction in number of plant species including NTFP producing plants as compared to about five years ago. This increases the vulnerability of local communities to climate change as well as loss of economic development opportunities for local populations living in and around forest areas. All these have resulted in the poor conservation of this area leading to the continued deforestation and degradation and increased carbon emissions.

It is therefore essential that management of the conservation area (park) is aimed at conserving biodiversity, providing the ecosystem services, including reducing emissions and enhancing carbon stocks in order to mitigate climate change as well as maintaining the livelihood of the local communities. However these aims are not being achieved. This project therefore aimed at ameliorating these conditions through participatory management and good governance so that provision of goods and environmental services by the Ankasa Conservation Area is maintained and enhanced, thereby preventing and reducing deforestation and degradation and improving livelihoods of the local communities. The interventions of this ITTO project are intended to address these challenges and support this conservation area to perform its function of reducing emissions from deforestation and degradation and enhancement of carbon stocks.

### 2.2 Development objective

The development objective is to contribute to sustainable management and conservation of Ankasa Conservation area to improve the provision of environmental services and reduce GHG emissions from deforestation and degradation as well as enhance carbon stocks in tropical forests.

### 2.3Specific objective

The specific objective is to develop and implement participatory, good governance and management system for the Ankasa conservation area, methods for measurement, assessment reporting and verification (MARV) for forest carbon as well as estimation of the value of environmental services

**2.3 Implementation strategy**

The strategies used in the project's implementation under the technical and scientific aspects include the following

i) Participatory management of the Conservation area: Community Resource Management Areas have been formed as part of the management of the Conservation area. However the committees responsible for these CREMAs lacked the capacities for management for conservation, including the restoration and rehabilitation of the degraded areas. They were also not motivated because they lacked resources for the management. Thus the project built the capacities of the committees for management and monitoring of the resource base as well as for restoration and rehabilitation. It provided resources needed for management including the provision of alternative livelihoods.

ii) Enhancement of biodiversity and carbon stocks, as well as reduction of emissions: In order to achieve the above objective, regular monitoring of the resource base with collaboration of the local communities was established. Thus the local communities were trained in the collection of all relevant data on biodiversity, carbon stocks and emissions. To facilitate monitoring, community based forest monitoring unit has been established under the CREMA structure

iii) Awareness and knowledge on REDD at local and regional level developed: Approaches here involved organization of workshops at the local and regional levels. Information delivery through community radio broadcast was employed. Brief education materials on REDD in simple and easy to read languages (English and vernacular) were presented to stakeholders at the various workshops and community meetings

iv) Community participation in forest conservation, monitoring of illegal logging and forest encroachment improved: Approaches included stakeholder consultation at various levels through workshops and community interactions. The CREMAs were strengthened through training, provision of logistics and incentives to improve their role in forest conservation, monitoring of deforestation and forest degradation related activities in the landscape

v) Governance and benefit sharing arrangements for REDD developed, and REDD concept mainstreamed within SFM activities. Local level governance structures were identified and for strengthening. Multi-stakeholder dialogues were used to promote policy harmonization as well as integration of local level initiatives in national strategies. Equitable benefit sharing arrangements as well as responsibilities were identified for development through stakeholder consultations. The capacity of the local communities on activities that contribute to SFM was enhanced and measures taken to mainstream these activities in their land use practices. Local level practices on SFM and good governance were identified and documented and lessons leant to serve as inputs in formulating the guidelines.

vi) Verifiable method for carbon accounting and monitoring developed: In order to establish a verifiable methodology for carbon monitoring and accounting, the approach involved the most up-to-date, but cost effective GIS and remote sensing based REDD monitoring methodologies. Field measurements were made using standard, but rigorously applied, forest sampling methods to assess forest biomass/carbon stocks. Recommended allometric equations suitable for the project area were used to estimate biomass stocks. Without compromising on scientifically approved standards, the project adopted measures that made local communities to play active role in carbon measurement and monitoring. Participatory GIS tools were employed to build and enhance the capacity of the local communities in forest resource and carbon mapping. This fostered transparency, helped increase benefits to the local people and also reduce the transaction costs associated with carbon measurement and monitoring.

vii) Baseline emissions and potential carbon credit under REDD project scenario determined: The project explored baseline approaches that reflect the local (national) circumstances. The project used approaches based on GIS modelling and remote sensing multi-resolution methods for mapping and qualitative analysis of baseline scenarios, estimation of emissions and enhancement of carbon stocks. GIS models that incorporate biophysical factors as well as socio-economic spatial information were explored. Monitoring of forest cover change was done using satellite remote sensing for determining

baseline deforestation rates against which future rates of change can be based. Adequate validation and accuracy assessments were carried out to determine the levels of uncertainties contained in the estimates. All these approaches were meant to provide improved spatially explicit information on the location of carbon stocks.

### 2.4 Assumptions and risks

The project had the objective of empowering local communities to participate in the management and governance of the National Park to achieve its prime aim of conservation and provision of environmental services. Thus major stakeholders in this regards are the local communities and the Officials of Wildlife Division who are currently managing the Park. The project assumed there may be conflict between officials of Wildlife division as the administrators and the local communities concerning the utilization of goods and services in the study area. The project assumed that if this conflict is not minimized it could demotivate the local communities and as such prevent them from undertaking the project activities. This had been identified as one significant risk of the project. To minimize this risk, the following actions were organized i) determination of potential risks and actions to mitigate these through participatory consultation with all stakeholders; ii) development of conflict resolution mechanism between the stakeholders; iii) empowerment of local communities in the implementation of the mechanism; iv) enhancement community forest enterprise around the conservation area to promote alternative livelihoods to local communities; v) Scaling up and dissemination of good lessons learnt in the implementation of project to the wider community in the Ellembelle and Jomoro Districts within which Ankasa National Park is located, as well as throughout the country.

## 3. Project Performance (Project elements planned and implemented)

### 3.1 Planned verses realized project elements

One activity was added during the project implementation-Activity 3.5 (Table 1). This was done at the project steering committee meeting with approval from ITTO. The planned specific objective, outputs and associated activities did not change as in Table 1. These activities have all been completed within schedule but with extension of additional 9 months with no extra budget from ITTO (Table 1).

Table 1: Realization of project elements based on YPO1, YPO2, and YPO3, YPO4, YPO 5 (6 months extension September 2015) and YPO (3 Months extension December 2015)

| Description of output/activities | Realization | Remarks |
|---|---|---|
| Objective:<br><br>Development objective:<br><br>to contribute to sustainable management and conservation of *Ankasa* Conservation area to improve the provision of environmental services and reduce GHG emissions from deforestation and degradation as well enhance carbon stocks in tropical forests<br><br>Specific objective:<br><br>to develop and implement participatory, good governance and management system for the Ankasa conservation area, methods for measurement, assessment reporting and verification (MARV) for forest carbon as well as estimation of the value of environmental services | | |

| | | |
|---|---|---|
| Output 1<br>Participatory management system developed and implemented | | |
| 1.1 identification of management system of areas surrounding conservation area | 100% | |
| 1.2 identification of relevant local stakeholders | 100% | |
| 1.4 strategic analysis of the drivers of forest degradation and deforestation | 100% | |
| 1.5 participatory development of management system | 100% | |
| 1.6 Implementation of developed system | 100% | |
| Output 2<br>Financial value of the environmental services provided by the conservation area determined | | |
| 2.1 identification of the ecosystem services provided by the conservation area | 100% | |
| 2.2 Determination of the financial value of these services | 100% | |
| 2.3 Validation of the estimates of the financial values | 100% | |
| 2.4 Preparation of final report with estimates | 100% | |
| | | |
| Output 3<br>Good governance and benefit sharing arrangements for PES developed | | |
| 3.1 Determine framework for good governance and benefit sharing for REDD | 100% | |
| 3.2 Development of best practice guidelines for forest governance | 100% | |
| 3.3 Stakeholder consultation to validate best practice guidelines | 100% | |
| 3.4 Dissemination of good practice schemes and lessons to stakeholder groups | 100% | |
| 3.5 Inventory and registration of trees planted by farmers | 100% | Additional activity |
| Output 4<br>Participatory methods for measurement, assessment, reporting and verification (MARV) of forest carbon developed and implemented | | |
| 4.1 participatory development of verifiable method for forest carbon estimation and monitoring developed | 100% | |
| 4.2 Determination of baseline carbon stocks | 100% | |
| 4.3 Establishment of baselines of forest cover changes | 100% | |
| 4.4 Participatory estimation of emissions reduction and enhancement in sequestered carbon under REDD project scenario | 100% | |

| | | |
|---|---|---|
| 4.5 Participatory development of reporting and verification methods | 100% | |
| 4.6 Establishment of social baselines and institutions for monitoring REDD | 100% | |

**3.2 Project duration**

The project commenced in April 2010. The planned duration was 48 months while the realized duration was 57 months.

**3.3 Project budget**

The total budget for the project is US$760,408.00. Out of this, ITTO contributed US$ 658,716.00 (Table 2) and the Government of Ghana (GOG) contributed US$101,692.00 (Table 2) for the purpose of the project implementation. Of the ITTO contribution, US$554,922 was realized and applied in the project implementation. The remaining amount of US$ 103,794 was used by ITTO for i) ITTO monitoring and review (US$40,000); ii) ITTO mid-term and expert evaluation (US$15000); and iii) ITTO programme support cost (8%) (US$48,794). The realized amount from the ITTO contribution for the project implementation was released in seven installments. The first installment of US$169,992.00 was received on 20th April 2010, the second ($59,996.00) on 4th March 2011; the third ($79,996.00) on 9th Dec 2011; the fourth ($65,990.00) on 13th February 2013; the fifth ($50,000.00) on 18th September 2013; the sixth ($90,000.00) on 9 December 2014. The seventh and the last installment of US$38,922.34 was received on 6 November 2015. This amount was received after the submission of the sustainability plan of the project, after its completion, to ITTO by the executing agency.

Table 2: Financial situation of the project (ITTO and EA contributions in US$)

| | | Component | Original Amount ITTO | Original amount EA |
|---|---|---|---|---|
| **I.** | **Funds managed by Executing Agency:** | | | |
| 10. | Project Personnel | | | |
| | 11 | National Experts (long term) | **$122,700.00** | **$19200.00** |
| | | 11.1 Project Coordinator | $33,600.00 | $9600.00 |
| | | 11.2 Agro forester | $10,000.00 | |
| | | 11.3 Forester | $18,000.00 | |
| | | 11.4 GIS/Remote Sensing Expert | $16,000.00 | |
| | | 11.5 Silviculturist | $10,500.00 | |
| | | 11.6 Socio-economists | $13,750.00 | |
| | | 11.7 Forest Technicians | $11,250.00 | |
| | | 11.8 Administrator | $9,600.00 | $9600.00 |
| | 12 | Other Personnel | **$94,550.00** | |
| | | 12.1 Driver | $14,400.00 | |
| | | 12.2 Secretary | $14,400.00 | |
| | | 12.3 Incentives to communities | $65,750.00 | |
| | 13 | National Consultant(s) | **$5,000.00** | |
| | | 13.1 Consultant on ecosystem services | $5,000.00 | |

| | | | | |
|---|---|---|---|---|
| | 14 | International Consultant(s) | **$10,000.00** | |
| | | 14.1 GIS/RS & Carbon Accounting | $10,000.00 | |
| | 19 | Component Total: | **$232,250.00** | **$19200.00** |
| 20. | Sub-Contract | | $0.00 | |
| | 21 | Sub-contract | | |
| | 22 | Sub-contract | | |
| | 29 | Component Total | **$0.00** | |
| 30. | Travel | | | |
| | 31 | Daily Subsistence Allowance | **$67,900.00** | |
| | | 31.1 National Expert(s)/Consultant(s) | $63,900.00 | |
| | | 31.2 International Consultant(s) | $4,000.00 | |
| | 32 | International Travel | **$22,000.00** | |
| | | 32.1 National Expert(s)/Consultant(s) | $18,000.00 | |
| | | 32.2 International Consultant(s) | $4,000.00 | |
| | 33 | Local Transport Costs | **$0.00** | |
| | | 33.1 National Experts/Consultant(s) | $0.00 | |
| | | 33.2 International Consultant(s) | $0.00 | |
| | 39 | Component Total: | **$89,900.00** | |
| 40. | Capital Items | | **$40,000.00** | **$12800.00** |
| | 41 | Premises | $0.00 | $8000 |
| | 42 | Land | $0.00 | $4800.00 |
| | 43 | Vehicle(s) | $40,000.00 | |
| | 44 | Capital Items Equipment | **$80,300.00** | |
| | | 44.1 Computer Equipment (Computers, printers, etc) | $14,000.00 | |
| | | 44.2 Forestry Equipment | $13,300.00 | |
| | | 44.3 Plotter | $10,000.00 | |
| | | 44.4 Softwares (ArcGIS, Erdas Imagine, etc.) | $33,000.00 | |
| | | 44.5 Ipas (with GPS+ArcPad Software | $10,000.00 | |
| | 49 | Component Total: | **$120,300.00** | **$12800.00** |
| 50. | Consumable Items | | **$78,872.00** | **$6000.00** |
| | 51 | Raw materials | $16,800.00 | $2000.00 |
| | 52 | Spares (Including vehicle maintenance) | $20,872.00 | |
| | 53 | Fuel & Utilities | $31,200.00 | |
| | 54 | Office supplies | $4,000.00 | $4000.00 |
| | 55 | Media, Publication and Education | $6,000.00 | |
| | 59 | Component Total: | **$78,872.00** | **$6000.00** |
| 60. | Miscellaneous | | **$33,600.00** | **$4000.00** |
| | 61 | Sundry | $20,800.00 | $0.00 |
| | 62 | Audit Costs | $4,800.00 | $0.00 |
| | 63 | Contingencies/steering committee | $8,000.00 | $4000.00 |
| | 69 | Component Total: | **$33,600.00** | **$4000.00** |
| 70. | National Management Costs | | **$0.00** | **$59692.00** |

| | | | |
|---|---|---|---|
| | 71. Executing Agency Management Costs | | $59692.00 |
| | 72. Focal Point Monitoring | | - |
| | 79. Component Total | **$0.00** | **$59692.00** |
| | **Sub-Total** | **$554,922.00** | **$101692** |
| 80. | Project Monitoring & Administration | **$103,794.00** | |
| | 81. ITTO Monitoring and Review | $40,000.00 | - |
| | 82. ITTO Mid-term and Ex-post Evaluation | $15,000.00 | - |
| | 83. ITTO Programme Support Costs (8%) | $48,794.00 | - |
| | 89. Component Total | **$103,794.00** | **-** |
| 90. | Refund of Pre-Project Costs (Pre-Project Budget) | | - |
| | **Sub-Total** | **$103,794.00** | **-** |
| 100. | **GrandTotal** | **$658,716.00** | **$101692.00** |

## 4. Project outcome, target beneficiaries involvement

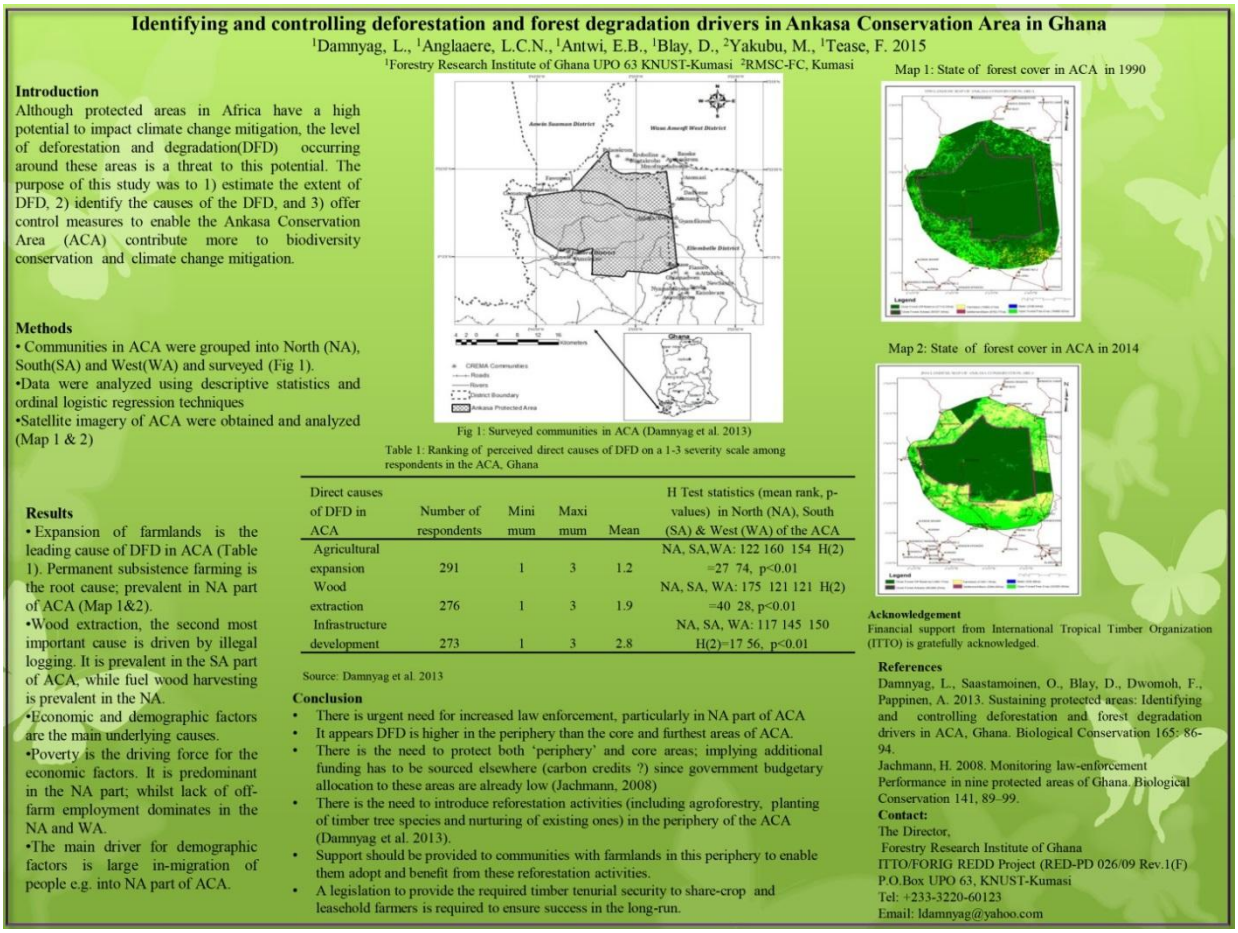
### 4.1 Specific objective achieved

The achievement of the specific objective has been assessed following the outcome indicators specified in project document as

**Outcome indicator # 1: Participatory management system and good governance**

For the development of the participatory management plan, the following activities specified in the project document under output 1 were undertaken; i) Identification of management system of areas surrounding conservation area; ii) Identification of relevant local stakeholders; iii) Strategic analysis of the drivers of forest degradation and deforestation in the Conservation area; iv) participatory development of management system; v) Implementation of developed system; vi) evaluation and review of management system.

The stakeholder analysis has been done and a technical report produced on **stakeholder analysis in Ankasa Conservation area**. In this report, the most influential groups of stakeholders that are key in the sustainable management of the conservation area have been identified. The report concludes that there is the need to empower or increase the power base of the highly ranked stakeholders (i.e. farmers) with high concern, but lower power for this conservation area. The strategic analysis of the drivers of forest degradation and deforestation in the conservation area has also been done. From this activity, one poster (Figure 1) and one journal article published in Biological Conservation have been produced.



**Identifying and controlling deforestation and forest degradation drivers in Ankasa Conservation Area in Ghana**

[1]Damnyag, L., [1]Anglaaere, L.C.N., [1]Antwi, E.B., [1]Blay, D., [2]Yakubu, M., [1]Tease, F. 2015

[1]Forestry Research Institute of Ghana UPO 63 KNUST-Kumasi [2]RMSC-FC, Kumasi

**Introduction**

Although protected areas in Africa have a high potential to impact climate change mitigation, the level of deforestation and degradation(DFD) occurring around these areas is a threat to this potential. The purpose of this study was to 1) estimate the extent of DFD, 2) identify the causes of the DFD, and 3) offer control measures to enable the Ankasa Conservation Area (ACA) contribute more to biodiversity conservation and climate change mitigation.

**Methods**

- Communities in ACA were grouped into North (NA), South(SA) and West(WA) and surveyed (Fig 1).
- Data were analyzed using descriptive statistics and ordinal logistic regression techniques
- Satellite imagery of ACA were obtained and analyzed (Map 1 & 2)

Fig 1: Surveyed communities in ACA (Damnyag et al. 2013)

Map 1: State of forest cover in ACA in 1990

Map 2: State of forest cover in ACA in 2014

Table 1: Ranking of perceived direct causes of DFD on a 1-3 severity scale among respondents in the ACA, Ghana

| Direct causes of DFD in ACA | Number of respondents | Mini mum | Maxi mum | Mean | H Test statistics (mean rank, p-values) in North (NA), South (SA) & West (WA) of the ACA |
|---|---|---|---|---|---|
| Agricultural expansion | 291 | 1 | 3 | 1.2 | NA, SA,WA: 122 160 154 H(2) =27 74, p<0.01 |
| Wood extraction | 276 | 1 | 3 | 1.9 | NA, SA, WA: 175 121 121 H(2) =40 28, p<0.01 |
| Infrastructure development | 273 | 1 | 3 | 2.8 | NA, SA, WA: 117 145 150 H(2)=17 56, p<0.01 |

Source: Damnyag et al. 2013

**Results**

- Expansion of farmlands is the leading cause of DFD in ACA (Table 1). Permanent subsistence farming is the root cause; prevalent in NA part of ACA (Map 1&2).
- Wood extraction, the second most important cause is driven by illegal logging. It is prevalent in the SA part of ACA, while fuel wood harvesting is prevalent in the NA.
- Economic and demographic factors are the main underlying causes.
- Poverty is the driving force for the economic factors. It is predominant in the NA part; whilst lack of off-farm employment dominates in the NA and WA.
- The main driver for demographic factors is large in-migration of people e.g. into NA part of ACA.

**Conclusion**

- There is urgent need for increased law enforcement, particularly in NA part of ACA
- It appears DFD is higher in the periphery than the core and furthest areas of ACA.
- There is the need to protect both 'periphery' and core areas; implying additional funding has to be sourced elsewhere (carbon credits ?) since government budgetary allocation to these areas are already low (Jachmann, 2008)
- There is the need to introduce reforestation activities (including agroforestry, planting of timber tree species and nurturing of existing ones) in the periphery of the ACA (Damnyag et al. 2013).
- Support should be provided to communities with farmlands in this periphery to enable them adopt and benefit from these reforestation activities.
- A legislation to provide the required timber tenurial security to share-crop and leasehold farmers is required to ensure success in the long-run.

**Acknowledgement**

Financial support from International Tropical Timber Organization (ITTO) is gratefully acknowledged.

**References**

Damnyag, L., Saastamoinen, O., Blay, D., Dwomoh, F., Pappinen, A. 2013. Sustaining protected areas: Identifying and controlling deforestation and forest degradation drivers in ACA, Ghana. Biological Conservation 165: 86-94.

Jachmann, H. 2008. Monitoring law-enforcement Performance in nine protected areas of Ghana. Biological Conservation 141, 89–99.

**Contact:**

The Director,
Forestry Research Institute of Ghana
ITTO/FORIG REDD Project (RED-PD 026/09 Rev.1(F)
P.O.Box UPO 63, KNUST-Kumasi
Tel: +233-3220-60123
Email: ldamnyag@yahoo.com

Figure 1: Poster produced from activity iii under output 1 of the project

The journal article is cited as **Damnyag, L., Saastamoinen, O., Blay, D., Dwomoh, K.F., Anglaaere, N.L., Pappinen, A. 2013. Sustaining protected areas: identifying and controlling deforestation and forest degradation drivers in the Ankasa Conservation Area, Ghana. Biological Conservation 165: 86-94.** This paper received very wide viewing worldwide, particularly in the first year after publication.

The management plan has been developed for the Ankasa Conservation Area. It was written based on the collaborative Wildlife Policy (2000) and in collaboration with the park management, and the local communities in the Ankasa Conservation Area within six of the nine different Community Resource Management Areas (CREMAs) in the ACA. A cluster of communities within seven Kilometers around the boundary of the Ankasa Park constitutes a CREMA. The CREMAs work with the park management to sustain the resources in and around the park. This management plan set out the objectives for the CREMAs, provided the actions necessary to achieve them, and introduced the framework for decision making by the executive committee members of the CREMAs and other stakeholders. The management plan has been handed over to the park management and the CREMAs leaders to continue with its implementation after the project's completion

Good governance and benefit share arrangements have been developed for PES (REDD) for the stakeholders and CREMA members in the project area. Activities specified under output 3 in the project document that have been carried out enabled the development of the good governance and benefit share arrangements for PES (REDD). These activities include (i) determine framework for good governance and benefit sharing for REDD, ii) development of best practice guidelines for forest governance, iii)

stakeholder consultation to validate best practice guidelines; iv) dissemination of good governance schemes and lessons to stakeholder groups; (v) Inventory and registration of timber trees planted by farmers on farmlands

To determine the framework for good governance and benefit sharing for REDD, surveys, focus group meetings, and community workshops were organized with local communities and related stakeholders in the Ankasa conservation area at different times (Figure 2). At these meetings, issues to bring about good governance in the area for equitable, transparent and effective future REDD+ development and smooth potential benefit sharing were identified, analyzed and discussed The results of these discussions and interactions have been used to produce two important and major scientific paper writing on **i) Tenure and 'carbon rights' in local REDD + projects: Insights from community-based workshops in South-western Ghana** , ii) Developing decision support system for optimizing benefits of agricultural land use in ACA under a REDD+ regime, Ghana. The first (i) paper was presented as a conference paper at the ROME 2015-SCIENCE SYMPOSIUM ON CLIMATE, jointly organized with the Italian Scientific Societies, from 19-20 November 2015 in Rome, Italy, at the FAO headquarters. This conference paper titled **'Tenure and 'carbon rights' in local REDD + projects: Insights from community-based workshops in Ankasa Conservation Area, Ghana'** has been rewritten as a journal paper and submitted for publication.

Figure 2: Map of Ghana showing the study area in ACA: a) Focus group and b) questionnaire survey

The second paper (ii) has been worked on for an MSc thesis in Bio-economy and Natural Resources by a student at the CSIR-FORIG/University of Eastern Finland (CSIR-FORIG campus) programme. The title of this thesis is '**optimizing land-use under REDD+ regime: a decision support model for farmers in Ankasa Conservation Area (ACA), Ghana'**. Findings of these detailed studies provide the needed inputs for the best practice guidelines for forest governance schemes for the ACA and the lessons therefore are carried in these publications to the wider readership both local and international.

For instance, the key findings which have relevance for the good governance, management systems and benefit share development are i) agroforestry has been identified as the land-use option available for farmers to optimize benefit under the REDD+ implementation. This was produced from the student's thesis. The thesis recommends that farmers in the ACA be sensitized on the significance of agroforestry and they should be supported by providing them with timber tree seedlings to plant in their farms to help address the deforestation and forest degradation and enhance carbon stocks and biodiversity. The key findings in the journal paper are that there need to be adequate education of local stakeholders and communities on REDD+ in ACA, the need for them to undertake land title registration; the need for national carbon rights definition and policy to be formulated and the need for community's preferences and suggestions to be taken into account.

The tree inventory and registration was necessitated by the issue of tree tenure of these trees that the farmers planted on their farmlands. The tenure became all the more a critical issue because, most of the farmers who planted these trees were migrant farmers. As part of the activities to streamline the tree tenure, the tree inventory and registration exercise was carried out under this project (RED-PD 026/09 Rev.1 (F)). The target farmers were those who planted or integrated the indigenous timber species on the farmlands with a minimum of fifty (50) standing trees. Plans were made to grow these trees at the beginning of the project. For instance, at the inception of the project, some indigenous timber tree species to be inter-planted in the farmlands (cocoa) of the target farmers and other land-use type were identified through effective participation of the project communities. A central nursery was established in one of the project communities and seedlings of indigenous timber species raised. These timber tree seedlings were distributed to the communities through the structures of the Community Resource Management Area (CREMA) to be planted on their farmlands.

To do the inventory and registration of timber trees on farmlands (Figure 3 &4), the district forest manager in Tarkwa who is in charge of forest outside the Ankasa Park was contacted. Through these contacts the rules and regulations guiding the registration of trees planted on farmlands were reviewed for such information to be passed on to farmers. The steps for the registration of such trees were also recorded. To undertake the actual inventory and registration, a cooperation contract was developed and signed between the executing agency represented by the Director and the project team and the Forest Services Division (FSD) represented by the district forest manager that oversees the Ankasa Conservation Area (ACA). This has been necessary, as without it, this registration could not have been done. Even if the project team ignored the FSD team and went ahead, the outcome would not have been accepted or recognized by the FSD as being the case that the farmers actually planted the trees inventoried. Owning to this, the cooperation contract was drafted and all efforts were made to arrive at consensus with the FSD team before it was signed.

The sub activities that were undertaken inorder to register these farmers were i) mobilization and sensitization of target farmers engaged in the tree planting on farmlands under the ITTO REDD project-RED-PD 026/09-The target farmers refer to farmers in communities in a) Navrongo-Tweakor b) Aiyinase-Ayawora, c) Ghana-Nungua Cocoa Town, d) Fia, v) Ohiamadwene-Fiasoro and e) Amokwa CREMAs in the Ankasa conservation area; ii) Consult the traditional authority to seek her consent and advice on the registration exercise; iii) prepare a record of the trees on the various farmlands planted in the six CREMA communities-This provided details of the timber species planted, the names of landowners, farmers and number that did the planting; iv) Prepare a register of the farmers engaged in the tree planting on the farmlands-This highlighted the details of each farmer engaged in the tree planting and it included a form bearing the logo of FC of Ghana; v) Prepare a data collection schedule and collect information on

opportunities, challenges remedial measures and lessons learnt for the planting of timber trees on farmlands in the Ankasa conservation by farmers.

Figure 3 & 4: Tree count and registration of farmers at Navrongo and Nyamebekyere communities in ACA

The significance of the tree inventory and registration was to secure the tree ownership for the farmers who planted the trees, as most of these farmers were migrants. The information on the inventory and registration has been prepared into the benefit share document titled '**Farmer tree inventory and registration in Ankasa Conservation Area, Ghana**'. This document has been duly signed by the FSD represented by the District Forest Manager of Tarkwa and the participating farmers who planted the trees on their farmlands. A copy of this document has been submitted to FSD of the Forestry Commission of Ghana. Each participating farmer has also been given a copy of this document-that is the portion of the document relating to the trees encountered on the concerned farmer's land.

The information on opportunities, challenges remedial measures and lessons learnt for the planting of timber trees on farmlands has also been analyzed and a technical report prepared following the 2009 format of ITTO manual for project monitoring, review, reporting and evaluation. The title of the technical report is '**Tree enumeration and factors affecting integration of trees on-farmlands for REDD policy response in south west Ghana'.** The main aim of this report was to contribute to the design and policy formulation to support tree planting on farmlands. A journal paper has been prepared from this information titled '**An analysis of farmer's willingness to pay for tree integration on farmlands in Ankasa Conservation Area, Ghana'.**

The forgoing detailed assessment show that the pre-specified outcome indicator # 1 as presented in the project document has been fully satisfied through delivery of outputs one (1) and three (3). By implication, the specific objective has actually and fully been achieved. Following from this, the achievement of the specific objective has significantly contributed to the objectives of the REDDES programme, namely i) Contribute to the social and economic sustainability of forest-dependent communities; ii) Improved capacities to develop and implement feasible policy options and incentives mechanisms to promote environmental services through sustainable forest management; (iii) Improved livelihoods for forest dwellers and other stakeholders directly involved in the supply of environmental services through the sustainable management of tropical forests; (iv) Improved practices to promote and stimulate community involvement in the supply of environmental services from the sustainable management of tropical forests, and their wide dissemination.

**Outcome indicator # 2: Financial value of environmental services estimated**

The financial value of the environmental services in the project site (Ankasa Conservation Area) has been determined. This has been done through the implementation of the activities outlined under output 2 in

the project document. These activities include (i) Identification of the ecosystem services provided by the conservation area; (ii) Determination of the financial value of these services; (iii) Validation of estimate of financial values of environmental services; and (iv) preparation of final reports with estimates.

An international consultant was hired to do this with the project team. Both biophysical and household survey data were collected in the study area (Figure 5) in order to do this. For the biophysical data collection, sample plots were laid (Figure 5) to collect the data, whilst questionnaire was used to collect the household data in the study area. One technical report titled **'Economic Valuation of Ecosystem Services of the Ankasa Forest Conservation Area in Wet Tropical Forest Zone of Ghana**' has been prepared. It followed the ITTO format of project technical report and detailed the problem addressed, the approaches used, the presentation of the data, the analysis and interpretation of the data, results and conclusion. A journal paper has been prepared on the technical report and published as follows: Mefin Tilahun, Lawrence Damnyag, Luke C.N. Anglaaere (2016) **'The Ankasa Forest Conservation Area of Ghana: ecosystem service values and on-site REDD+ opportunity cost'**. Forest Policy and Economics 73: 168-176.

This assessment shows that the pre-specified outcome indicator # 2 as presented in the project document has been fully satisfied through delivery of output two (2). By implication, the specific objective has actually and fully been achieved. Following from this, the achievement of the specific objective has significantly contributed to the objectives of the REDDES programme, namely i) enhance adaptation and resilience of tropical forests to negative effects of climate change and human-induced impacts with the objective of quantifying carbon stocks in different land use systems; (ii) contribute to the social and economic sustainability and well-being of forest-dependent communities by increasing forest values through forest restoration and rehabilitation as well as payments for forest-based environmental services.

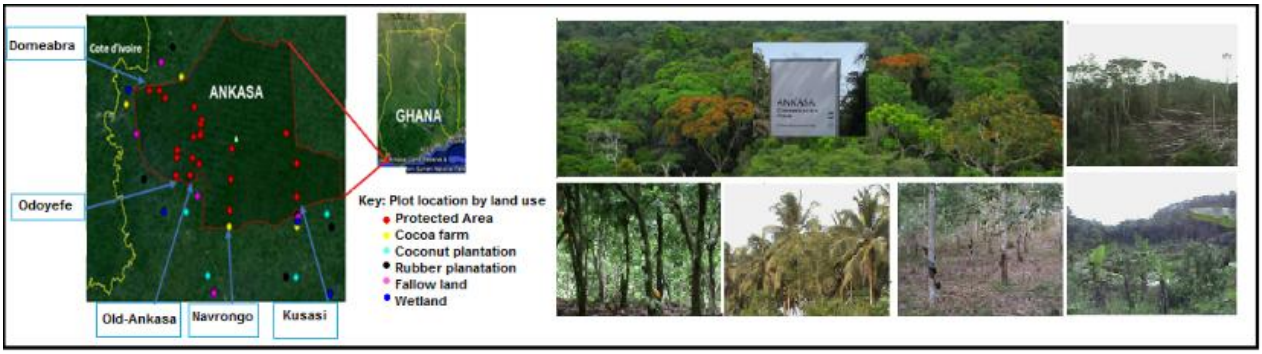



Figure 5: Location of the study area and plots locations by land uses.

**Outcome indicator # 3: Participatory measurement, assessment, reporting and verification (MARV) methods**

The purpose for this indicator was to develop participatory measurement, assessment, reporting, and verification (MARV) methods for forest carbon stocks under output 4 spelt out in the project document. The activities specified in the project documents that have been carried out to achieve this include i) participatory development of verifiable method for forest carbon estimation and monitoring (based on a combination of field surveys and monitoring through satellites images); ii) Determination of baseline carbon stocks; iii) Establishment of baseline of forest cover changes; iv) participatory estimation of emissions reduction and enhancement in sequestered carbon under REDD project scenario; v) Establishment of social baselines and institutions for monitoring REDD; vi) participatory development of reporting and verification methods.

For the participatory development of verifiable method for forest carbon estimation and monitoring and the participatory development of reporting and verification methods, three methodical tools/outputs were

produced for use in reporting, verification and monitoring purposes. These include; i) Carbon Maps of the landscape based on results from Carbon Accounting, ii) Model/estimates of carbon for the study area, iii) Monitoring and reporting for carbon stock changes scheme for the Ankasa conservation area

To establish the baselines (carbon stocks and forest cover changes (Figure 6)), 20-year time consistent Landsat images were procured and used for estimating land use conversion and the carbon emission. Field measurement using sample plots were laid representatively all over the land in the project area and biophysical data collected and added to the information obtained from the landsat images to obtain the carbon stocks and forest cover changes. The sample plots established will be used as permanent plots for re-measurement and monitoring of the carbon stock in subsequent years in the study areas. A technical report has been produced on the baseline stock assessment for monitoring purposes. The title of the report is **Forest carbon stocks assessment and monitoring in Ankasa conservation area.**

Under the participatory development of reporting and verification methods, a community based forest monitoring model has been developed. A technical report on this has been produced. The title is **community forest monitoring in REDD+ under MRV in Ankasa Conservation Area, Ghana.** For this study, a team of community members were selected in accordance with agreed-upon criteria during community meetings. They were trained about the best practices of monitoring and reporting in 2015 at community meetings. During the community meetings, clear guidelines and standards about how monitoring and reporting should be done were established. These were harmonized across different localities so that the results are comparable at local, national and international levels. In addition, the types of data the communities are willing and able to supply were defined.

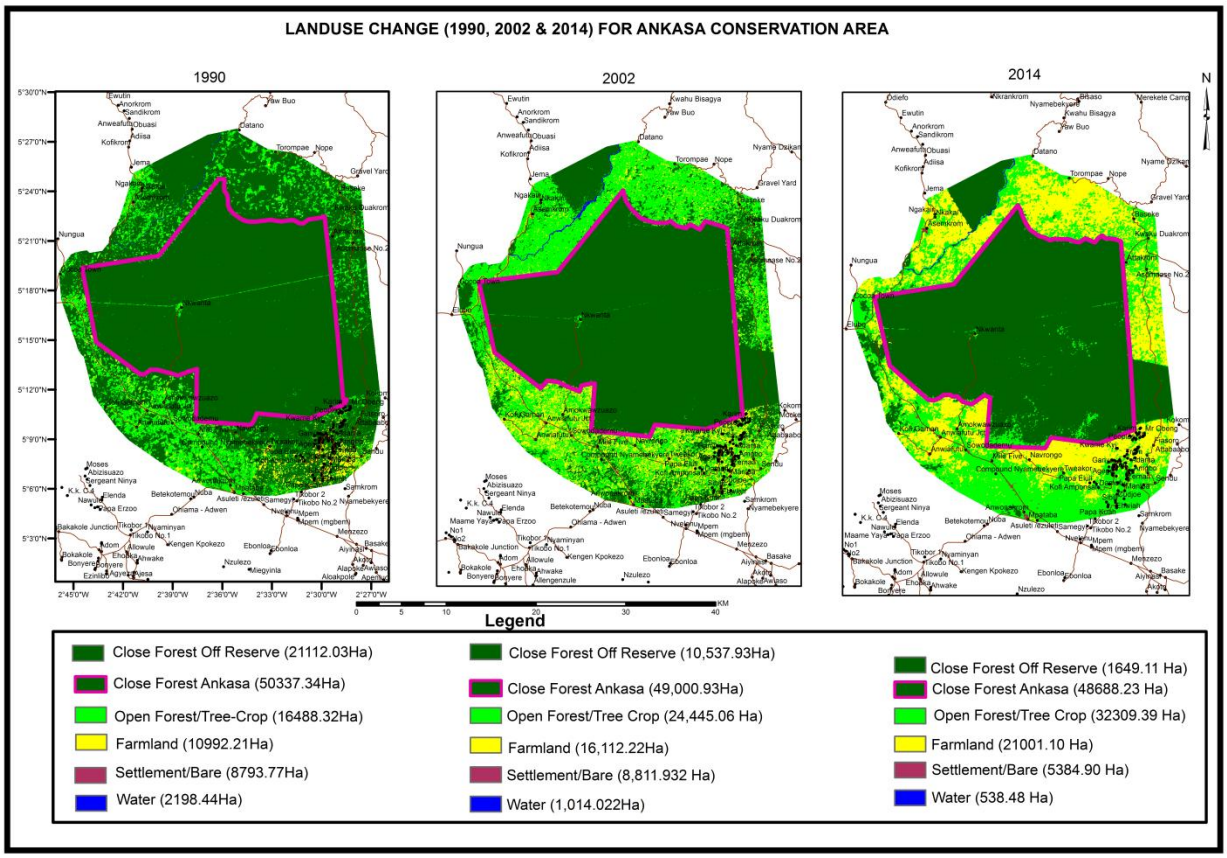



Figure 6: Established forest cover change map in Ankasa Conservation Area, Ghana

For the participatory monitoring activities, a check list of forest activities such as fire incidence, logging, farming, collection of fire wood and hunting trails were designed for communities to record and report on. In each area or community that the monitoring meeting and training was held, community members were guided to select a monitoring team that involve, a chairman (leader of the team) and three other members with at least one with the ability to read and write. This monitoring team led the monitoring in the community. Other community members were required to report any sighting of deforestation and forest degradation related activities to this monitoring team to record. The forms were distributed to the monitoring team members in each community that the training was conducted in May 2015. The data collection was done for two weeks following the training in June 2015. The data collection was done simultaneously in all the communities that the schedule forms were distributed. During this time, the monitoring team members and other members in the community report on the form daily, the deforestation and forest degradation related activities they sight in the landscape around their communities in the CREMA areas. The secretary to each of the monitoring team does the entry on the form. Enough of these forms were distributed such that they covered for the two weeks monitoring. In filling one form, the information is continued on a new form if the previous one was full. A total of 22 of the filled forms were collected from the various monitoring teams. The information recorded on the forms was entered in SPSS software and analyzed using descriptive statistics including frequency of sighting of DFD related activities and animals/special biological species. Two-way contingency table analysis was also conducted to evaluate whether statistical relationship exist between CREMAs/locations/communities and frequency of sighting of deforestation and forest degradation related activities in the study area.

The conclusions in the present study are that the CBM offers a tangible explanation for land cover change results obtained through scientific monitoring using remote sensing techniques. Such explanation is otherwise not available with only the remote sensing monitoring method. The results of CBM also raise awareness among community members about the level of DFD in their area and urge them to contribute to address the problem.

Under the establishment of social baselines and institutions for monitoring REDD, these institutions and arrangements for the monitoring REDD+ were evaluated. The method applied was desk study involving a literature review. Field visit was done to identify and evaluate these social baselines and institutions in the study area. The technical report has also been produced from this on **Social baselines, institutions and arrangements for monitoring REDD + in Ankasa conservation area, Ghana**

The most significant outcomes obtained under this output 4 included the following (i) Map of major land use classes for 3 time periods in Ankasa Conservation area; (ii) Change maps and change of area in size (ha); (iii) Report on the land use conversions in terms of the area content in a matrix form; (iv) Carbon Maps of the landscape based on results from Carbon Accounting Team; (v) Model/estimates of carbon for the study area; (vi) Monitoring and reporting for carbon stock changes scheme for the Ankasa conservation area; and (vii) Established social baseline and institutions for Monitoring REDD+ in ACA

The assessment that has been done as detailed in the preceding section shows that the pre-specified outcome indicator # 3 as presented in the project document has been fully satisfied through delivery of output four (4). As a result, the specific objective has actually and fully been achieved. Following from this, the achievement of the specific objective has contributed to the objectives of the REDDES programme, namely i) enhance adaptation and resilience of tropical forests to negative effects of climate change and human-induced impacts with the objective of quantifying carbon stocks in different land use systems; (ii) Maintain and enhance climate change mitigation and other environmental services of tropical forests.

**Outcome indicator # 4:Capacities of local communities built in management systems and MARV**

Five capacity building programmes were developed and carried out to build the capacity of the local communities in the management systems and the MARV. These were i) seedlings production and planting on farmlands under output 3; ii) training on carbon stock assessment, iii) training on community

based forest monitoring under output 4, iv) training on alternative livelihoods and v) education on REDD+ policy. To let community undertake the tree planting on the farmlands, a group of the community members were trained on the timber tree seedling production. This group was supplied with the seeds to produce the seedlings (Figure 7 & 8). The participating farmers were trained on how to plant these seedlings. The seedlings were lifted from the nursery and distributed to the individual farmers to send to their farms to plant.


Figure 7& 8: Seedlings production in central community nursery in Ankasa Conservation Area, Ghana

Alternative livelihood supports were delivered to the participating farmers in the project. These included fish farming, beekeeping and livestock rearing. To enable target farmers operationalize these livelihood supports and benefit from them, their capacities were built. One of these was the sheep livelihood support programme. Participating farmers were trained on sheep rearing and the pens constructed and stocked with the sheep for them to rear (Figure 9 & 10).


Figure 9 & 10: Pen stocked with sheep for Ghana Nungua Cocao Town CREMA in Ankasa Conservation Area, Ghana

For the carbon stock assessment, communities were also trained to do that (Fig 11 & 12). The training was organised in the classroom setting where the basics were explained to them. They were then sent to the field where demonstrations were done and they were guided to do the measurements themselves.

Figure 11 & 12: capacity building in carbon stock assessment of local communities in Navrongo-Tweakor CREMA, Ankasa, Ghana

For the development of the participatory reporting and verification methods, participating communities were trained on the identification of deforestation and forest degradation related incidences in the landscape at community workshops (Fig 13 & 14). The groups of community members nominated to record these forest related disturbances were also trained on how to record these on a schedule that was designed and copies distributed to them.

Figure 13 & 14: Training on identification of deforestation related disturbances using the land cover change map of ACA for CREMA members, Ghana

Capacity building on REDD and identification of stakeholders in the Ankasa Conservation area was also conducted for local communities in the project (figure 15 & 16). The purpose of this was to educate the communities on the importance of the emerging international forest policy (REDD) and its objective to reduce emissions from deforestation and forest degradation, enhance carbon stocks and conserve forest. They were also educated on the compensation package associated with REDD+ through the carbon offset market.

Figure 15&16: eduction on REDD+ and stakeholder identification in Ankasa Conservation Area, Ghana

As demonstrated in the assessment detailed in the preceding section, the pre-specified outcome indicator # 4 as presented in the project document has been fully satisfied through delivery of output four (4), one (1) and three (3). From this assessment, the specific objective has actually and fully been achieved. Following from this, the achievement of the specific objective has contributed to the objectives of the REDDES programme, namely i) enhance adaptation and resilience of tropical forests to negative effects of climate change and human-induced impacts with the objective of quantifying carbon stocks in different land use systems; (ii) maintain and enhance climate change mitigation and other environmental services of tropical forests; iii) contribute to the social and economic sustainability of forest-dependent communities; iv) improve capacities to develop and implement feasible policy options and incentives mechanisms to promote environmental services through sustainable forest management; (v) improve livelihoods for forest dwellers and other stakeholders directly involved in the supply of environmental services through the sustainable management of tropical forests; (vi) improve practices to promote and stimulate community involvement in the supply of environmental services from the sustainable management of tropical forests, and their wide dissemination.

### 4.2 Existing situation at project completion vs pre-project situation

The tangible outcomes of the project are;

i) Techniques, strategies and governance lessons for engaging local communities to integrate trees on farmlands (cocoa) outside forest reserves have been developed. These have been achieved through capacity building of communities on alternative livelihood programmes; nursery establishment; tree planting on farmlands; facilitating the inventory and registering the trees planted and farmers involved; tree registrations document handed over to the communities with copies to the relevant authorities; and study of the process with recommendations formulated for improvement.

ii) Over 8,766 of the planted trees involving different species have been enumerated. Over 129 farmers consisting 84% male and 16% female who planted these trees were surveyed and the opportunities, silvicultural and governance challenges and remedial measures for addressing the challenges obtained and handed over to the relevant authorities including Forestry Commission of Ghana (Forest Services Division, Wildlife Division and REDD Secretariat of Ghana). These provide Lessons on mainstreaming REDD activities into SFM, because they will enhance forest carbon stocks and improve biodiversity, watershed

conditions and other environmental services although it is conditional on the sustainability and management of the trees planted.

iii) The economic value and REDD opportunity cost of forest resources of the project area have been estimated. The causes for the deforestation and forest degradation in the project area have also been identified. These have been done through detailed studies which have been published in two very high impact factor international journals. These papers have formulated key policy implications and recommendations to improve the REDD in the project area and in similar areas inside and outside the country. In addition to these, one other study completed on tenure and carbon rights in local REDD project provides lessons on forest resources governance and benefit sharing arrangement for REDD in the country. This study was presented as a conference paper in Rome 2015-Science Symposium on climate, 19-20 November, 2015. It contributed to the overall objective of the symposium which was to address the advances in Climate Sciences, Adaptation and Climate Impacts, Mitigation strategies.

iv) Methodologies on Measurement, Assessment, Reporting and Verification have been developed using data collected in the project site. These methods have been applied i) to produce the land cover change maps in the project area; ii) to produce baseline carbon stock in the project area; iii) to produce a technical report on community-based forest monitoring of REDD+ data collection, analysis and reporting in the project area. These provide technical lessons for the development of overall national REDD strategy for Ghana.

v) Management plan has been developed to add to what the Ankasa park management from the Wildlife Division already has. This plan is particularly targeted at the management of the CREMAs outside the Ankasa Park. The relevant stakeholders have also been identified through a detailed stakeholder analysis study done in the project area. The report is meant to enable the park management to draw on these relevant stakeholders to ensure the sustainable management of the area

### 4.3 Involvement of project beneficiaries

The primary beneficiaries of the project are the local communities in the CREMAs, the park management from the Wildlife Division and Forest Services Division of the Forestry Commission of Ghana. Their involvement is summarized as follows

- The local communities participated in the implementation of the activities of the project. They were involved in all the capacity building and education programmes, seedlings productions, seedlings planting and maintaining planted trees, survey data collection by responding to questionnaire and participating in focus group discussions, monitoring deforestation and forest degradation related activities in the landscape in the project area. They were also involved in the project steering committee meetings and project monitoring missions undertaken by ITTO
- Park management of the ACA was involved in almost all project activities implementation. These include the survey data collection, focus group discussion, distribution of seedlings to farmers, training and education of farmers on REDD and stakeholder identification, farmer tree inventory and farmer registration. The park management were also involved in project steering committee meetings

- The FSD staff were involved in the project through the tree inventory and registration of farmers, documenting these registration and keeping safe to be used in future to ensure farmers get their share of the timber proceeds

### 4.4 Project sustainability after completion

The executing agency has worked very hard to realize all the activities specified in the project document. These have been done through detailed studies, stakeholder analysis, seedlings production, distribution, planting and registration of the trees planted for the farmers, development of management plan, measurement, assessment, reporting and verification methodology development and capacity building of the local communities in the project area. These have been done in close collaboration with the relevant stakeholders in the country including the local communities, Forestry Commission of Ghana (Wildlife Division, Forest Services Division and REDD Secretariat), the Ministry of Food and Agriculture, District Authority and the administration of stood land authority.

To continue with outputs of the project,

i) the Park management of the Wildlife Division of the Forestry Commission of Ghana, will continue to work with members of CREMAs with the implementation of the management plan developed particularly for the local communities
ii) The district assembly/authority of project area is also to offer CREMAs with support both financial and logistics for their activities that include the project activities
iii) The FSD and the park management are also to continue to support the project farmers and other communities with the planting and maintenance of the trees on farmlands. This support is to be related to seeds and seedling acquisition by farmers for the planting including securing tenure security (registration for the farmers) and education on good silvicultural practices
iv) The community forest monitoring technique developed for the monitoring of DFD in the project area and the associated results of the community monitoring are to be taken up by national REDD+ secretariat of Ghana, the FSD and the park management. These would be used for the development and implementation of the emission reduction plan of Ghana
v) The agricultural extension officers of the MOFA are also to continue to offer support to the farmers relating to the sheep livelihood and agroforestry activities in the project area
vi) Continued publication and dissemination of the research results of the project is being done by the executing agency and its collaborators to ensure replications and scaling up of research to address DFD in and outside Ghana.

## 5. Assessment and analysis

### 5.2 Project rationale and identification process

The Ankasa national park is the site where the activities of the project have been implemented. The cluster of communities within 7km to the boundary of the park has been organized into nine (9) community resources management areas (CREMAs). These CREMAs are distributed around the western, southern, eastern and northern parts of the park. The purpose of these CREMAs is to support the Ankasa park management to sustainably manage the park both inside and outside. The unstainable management of the park by these two stakeholders leading to higher deforestation and forest degradation, and increased $CO_2$ emission led to the identification, development and implementation of this project. The identification of the project was done in detail. It involved stakeholders before and during the implementation of the project. The identification process coincided with the operation of CREMAs in the protected areas and the development of national REDD policy in the country. As a result, understanding on the issues to be tackled by the project was in-depth, while the issues addressed were

relevant and consistent to the need of the local communities in the CREMAs, Wildlife Division of the Forestry Commission of Ghana and the national REDD secretariat.

**5.2 Problem addressed, objectives and implementation strategy**

The Ankasa national park, which is the study area of the project, has the highest biological diversity of any place in Ghana, with over 300 different plant species recorded in a single hectare. According to Birdlife International (2009), Ankasa is considered to be the 'hottest' forest in Ghana. The Ankasa national park contains one of the few remaining blocks of relatively untouched forest in the country. This, plus the faunal diversity of the site, makes the area one of the most important sites for conservation of forest biodiversity in Ghana. Animal life includes the elephant, bongo, chimpanzee, Diana monkey, and 263 species of birds. However due to encroachment of local communities for unsustainable shifting cultivation for both food and cash crops, the park is being over-exploited leading to a lot of deforestation and degradation. The impact of this is that there has been a reduced supply of forest products which the local communities depend. There have also been increased $CO_2$ emissions, loss of biodiversity and reduction of water quality and supply and increased soil erosion.

Following from this, the key problem addressed was the unstainable conservation of the Ankasa National Park leading to deforestation and forest degradation and increased carbon emissions. The specific objective was to develop and implement participatory, good governance and management system for the Ankasa conservation area, methods for measurement, assessment reporting and verification (MARV) for forest carbon as well as estimation of the value of environmental services. The development objective was to contribute to sustainable management and conservation of Ankasa Conservation area to improve the provision of environmental services and reduce GHG emissions from deforestation and degradation as well as enhance carbon stocks in tropical forests.

The strategy applied in implementing the project was participatory and collaborative in nature with the following project elements

**Output 1:** Participatory management system developed and implemented

- Identify management system of areas surrounding conservation area
- Identify relevant local stakeholders
- Undertake strategic analysis of the drivers of forest degradation and deforestation in the Conservation area
- Participatory develop management system
- Implement developed system
- Evaluate and review management system

**Output 2:** Financial value of the environmental services provided by the conservation area determined

- Identify the ecosystem services provided by the Conservation area
- Determine the financial value of these services
- Validate the estimates of the financial values
- Prepare final report with estimates

**Output 3:** Governance and benefit sharing arrangements PES developed

- Develop framework for good governance and benefit sharing for REDD
- Develop best practice guidelines for forest governance
- Undertake stakeholder consultation to validate best practice guidelines and framework for good governance and benefit sharing
- Disseminate good practice schemes and lessons to stakeholder groups

**Output 4:** Participatory methods for measurement, assessment reporting and verification (MARV) of forest carbon developed and implemented

- Develop verifiable method for forest carbon estimation and monitoring in a participative manner
- Determine baseline carbon stocks
- Establish baselines forest cover changes
- Estimate emissions reduction and enhancement in sequestered carbon under REDD project scenario in a participatory manner
- Establish social baselines and institutions for monitoring REDD

- Develop reporting and verification methods in participatory manner

**5.3 Critical differences between planned and actual project implementation**
As indicated in section 3, no change has been made to the development objective, specific objective and the outputs. Most of the planned activities were unchanged. The only additional activity was inserted under output 3. The additional activity that leads to the modification was activity 3.5: Inventory and registration of timber trees planted by farmers on farmlands. The addition of this activity came as a request from the farmers in the project site. The request was discussed and endorsed at the project steering committee meeting. From the forgoing, the difference between the planned and actual project implementation was not significant. The little addition improved the project's outcomes and sustainability

**5.4 Adequacy of time and project inputs**
The project was implemented according to the planned schedule. The project duration was initially planned for 48 months. It started in April 2010 and ended in December 2015. The actual duration was extended for 9 months to enable the successful execution of the project activities, particularly the additional activity that had to do with the inventory and registering of farmers and their trees planted on the farmlands

The total expenditure of the project was US$ 656614. Out of this, US$101692 was the expended amount from the GOG contribution and US$554922 from the ITTO contribution. For the ITTO contribution, the amount was received in seven installments and spent accordingly on the execution of the project's activities. All payment of the installments was done timely and the amounts spent on the specified project activities.

**5.5 External influences**
The assumptions made concerning the implementation of the project were valid during the duration of project implementation. For instance, the aim of the project was to empower local communities to participate in the management and governance of the Ankasa National Park in order to achieve its prime aim of provision of environmental services. It was assumed that the major stakeholders – the park management on one hand and the local communities on other hand – would not cooperate to bring about the achievement of this objective because conflict regarding the use of the goods and services was anticipated to arise between these two major stakeholders that manage the Ankasa Park.

The measures of mitigation outlined in the project document were effective in minimizing this conflict in most cases during the duration of the project. The local communities undertook the activities of the project on the field, regarding attendance on capacity building training, application of skills and knowledge acquired in the sustainable management of the national park, particularly areas outside the park termed the CREMAs. The Ankasa Park Management on its part mobilized local communities to undertake the project activities. For instance, the park management supported local communities with the distribution of seedlings for planting on their farmlands, assisted them to register these trees with the relevant authority and helped train and build their capacity in various areas including stakeholder analysis, identification of deforestation and forest degradation related incidences, and REDD architecture and payment for environmental services (PES). The two stakeholders work together to implement the management plan developed for the area.

**5.6 Project beneficiaries**
The primary beneficiaries were the local communities within the CREMA, the Ankasa Park Management from the Wildlife Division, and the Forestry Services Division. Each of these was actively involved in the project implementation.

The local communities did the field work relating to planting and maintaining of trees on their farmlands, upkeep of livelihood support programs, participation in capacity building trainings and application of these skills and knowledge in the sustainable management of the landscape in the project area.

The staff of the WID represented by the Ankasa Park management also contributed to the project's implementation. They mobilized local communities to implement project activities, participate in different studies of the project, e.g. socioeconomic and biophysical data collection, training workshops and steering committee meetings

The other beneficiaries included the traditional authority that supported the tree planting on their lands, the FSD that manages timber trees in and outside forest reserves in Ghana, the Ministry of Food and Agriculture represented by their extension staff on the field with the farmers. The District Assemblies (Local government authority) from the Administrative districts of the project area are in charge of the overall development of the districts, relating to construction of access roads to project sites among others. The National REDD Secretariat of the Forestry Commission of Ghana in charge of development of emission reductions plan and the national REDD architecture. It makes use of the results and findings developed from the project

**5.7 Sustainability**

The inventory and the registration of farmers and their trees planted on the farmlands that have been done under this project have raised the interest of farmers in this activity. A lot more farmers in and outside the project communities have shown interest in this exercise and are requesting for timber tree seedlings to plant. The request for the tree seedlings was made at the project internal evaluation meeting by farmers. The FSD, MOFA and the Wildlife Division represented by the Ankasa Park Management, are to fill this gap by supporting farmers with the tree seedlings to sustain this activity through the Forest Investment Programme (FIP) under the Forestry Commission of Ghana (FC).

In developing the methods for the Measurement, Assessment, Reporting and Verification (MARV) under this project, sample plots for biophysical data collections have been laid, baseline land cover change maps have been produced, the baseline carbon stocks of the project site have been produced, community monitoring schedule have been drawn and communities trained on monitoring deforestation and forest degradation related activities and pilot community-based forest monitoring data collected and report produced. These are important methods, technologies, strategies and information obtained from the project that are relevant for monitoring deforestation and forest degradation, and carbon emission reduction activities in and outside the project sites. The national REDD secretariat supported by the Ankasa Park Management of the WID and FSD would make use of these in the development of emission reduction plans for Ghana. They will make use of these to monitor the deforestation and forest degradation, and the carbon stock in and outside the project area to validate the national carbon emission reductions strategies and designs

In order to consolidate the developed methodologies, technologies, strategies, livelihood support programs and research findings obtained from the project and sustain the tree planting interest among and outside the project farmers, a second phase of this project would be very useful in this direction. Whilst aiming to consolidate the activities of the first phase, the second phase project should aim at scaling up the activities, helping to address remaining problems in the study area including the land title registration, and supporting the development of national emission reduction plan including national carbon right policy. At the project's internal evaluation meeting that marked the close of the project, the local communities in the project made these requests. Among other things at this project internal evaluation meeting, they requested that they are supported to do their land title registration to harmonize the land acquisition process particularly for the agroforestry activities in the area. The local communities noted that this land title registration was necessary because land tenure has become a big issue in the main project district (Jomoro) and it is creating problems for the landowners, farmers and the trees grown on farmlands.

### 5.8 The institutions involved

The institutions involved in the project implementation were;

The local communities and their roles and responsibilities were the implementation of project activities on the field relating to agroforestry.

The staff of the WID represented by the Ankasa Park management also contributed in the project implementation. Their role and responsibilities were also appropriate and they performed them satisfactorily.

The other institutions involved in the project included the traditional authority that supported the tree planting on their lands, the FSD that manages timber trees in and outside forest reserves in Ghana, the Ministry of Food and Agriculture represented by their extension staff on the field with the farmers.

The District Assemblies (Local government authority) from the Administrative districts of the project area also had a role to play in terms of the overall development of the districts including project areas.

## 6. Lessons learned

### 6.1 Project identification and design matters

The creation of Community Resource Management Areas (CREMAs) in protected areas, particularly in the Ankasa Conservation Area, which is the study site of the project, has been useful in addressing the conservation challenges in these protected areas. The project was timely initiated to help the local communities in these CREMAs and the Park management in their task of addressing the conservation challenges in this area.

The partnership between the local communities and the park management within the CREMA structure, apart from being a useful arrangement in ensuring the sustainable management of the ACA, was also a very helpful medium in the identification process, development and implementation of this project. Within the CREMA structure, the key problem of the project was thoroughly analyzed in collaboration with these two main stakeholders. The main and sub causes of the problem to be addressed were identified. The effects of this problem were also identified including the impacts. Following from this, thorough identification of the activities of the project was done to coincide with the sub causes. The main outputs were identified to coincide with the main causes and the specific objective identified to coincide with the key problem. The specific objective was carefully identified to contribute to the development objective of the project. The project design was very sound because, there were sufficient interventions including the outputs and corresponding activities to address the problem. To ensure sustainability of the project after completion, a sustainability plan was designed earlier, and presented to the project stakeholders at the internal evaluation workshop. Areas for actions to be taken to ensure the sustainability were outlined and responsible stakeholders identified to take up these actions to ensure sustainability.

### 6.2 Operational matters

The executing agency of this project was the CSIR-Forestry Research Institute of Ghana (FORIG). The implementation of the project was participatory. The main collaborators were the local communities in the different CREMAs in the ACA, and the Wildlife Division of the Forestry Commission of Ghana represented by the Park Manager and the technical staff at the ACA. The academic institutions – Kwame Nkrumah University of Science and Technology (KNUST), The Forest Service Division of the Forestry Commission of Ghana, ITTO secretariat, the traditional authority, the local government authority (District Assembly) and the Ministry of Food and Agriculture of the project districts all collaborated. Their active collaboration and participation in project implementation ensured the smooth operation of the project.

The roles and responsibilities of these collaborators were spelt out at the beginning of the implementation of each specific activity of the project. This avoided confusion in the project implementation. Project documentation was carefully done. Technical reports were written following the guidelines of ITTO and other journal papers thoroughly written and published in Journals with high international reputations.

Monitoring and evaluations have been held satisfactorily, within the PSC meetings, chaired by the Director of the Forestry Research Institute of Ghana and the project coordinator. Five to six of these PSC meetings have been held. These meetings have always been attended by members of the PSC to provide important guidance for the project operations

Working with local communities on field activities associated with their livelihood and environment is a special exercise that requires special attention and understanding of the needs of these communities to be successful. The field monitoring by ITTO and the executing agency contributed significantly to the successful implementation of the planned project activities. During those monitoring exercises, challenges associated with the implementation of the project were identified earlier and addressed, local communities encouraged to continue to work on the project and their needs related to the project were also identified and addressed. For instance, it was during these monitoring exercises that the activity on the inventory and registration of the farmers and the trees planted on the farmlands was identified and carried out.

The inputs of the project were timely transferred to the executing agency based on the submission of the yearly plan of operations and one sustainability plan to ITTO secretariat. The funds transfer which was sufficient in quantity and quality was done in seven installments.

## 7. Conclusions and recommendations

7.1 Conclusions

- The partnership between the local communities and the Park Management within the CREMA structure that work for the sustainable management of the ACA was a very important arrangement used in the identification, development and implementation of this project.
- The key problem of the project was thoroughly analyzed in collaboration with the stakeholders and the main and sub causes were related to the problem addressed.
- The project design was very sound because, there were sufficient interventions including the outputs and corresponding activities to address the problem.
- The project implementation was smoothly done largely because of the participatory strategy applied. The key sources of this smooth implementation were the cooperation between local communities and different collaborators, the dedicated project management team, the able PSC and the helpful and cooperative support from ITTO secretariat
- The needs, concerns and suggestions of the local communities, who were the primary beneficiaries were duly considered at every stage of the project's implementation
- The project was managed in full compliance with existing ITTO rules and procedures. Employment of project personnel, national and international consultants as well as procurement of capital items were made based largely on approval of ITTO.
- The specific objective of the project has been fully achieved through delivery of all planned outputs and execution of the activities pertaining to individual outputs
- The project results have been disseminated through the meetings of the PSC, project internal evaluation workshop, publications in international and domestic journals and presentations at international conferences.

### 7.2 Recommendations

- The key problem to be addressed by a proposed project must be adequately analyzed in the best way that correctly identify relevant main-causes and sub-causes of the problem as the basis for defining relevant project elements and intervention.
- In achieving the soundness of a project design, it should be closely linked with adequacy of problem analysis

- Roles and responsibility of the stakeholders need to be identified and assigned prior to the implementation of each activity of the project. This helps to forestall any risk and confusion and brings about smooth implementation of the project
- It is advisable to put together, a well dedicated project management team, ensure timely availability of inputs in terms of funds and establish PSC to provide good counsel to project management team
- It is also advisable a project is implemented in a participatory manner. This will engage the stakeholders and help create ownership and increase support to the project during its implementation and after completion.
- It is recommended a sustainability plan be drawn and discussed with the project stakeholders and partners. So that actions and programs to be taken to ensure sustainability of the project after completion are identified during these discussion sessions and the responsible institutions identified to make follow up on these actions and programs
- Field monitoring by ITTO and the executing agency is required to ensure the successful implementation of the planned project activities. During those monitoring exercises, challenges associated with the implementation of the project need to be identified and addressed, local communities encouraged to continue to work on the project and their needs related to the project also identified and addressed.
- A second phase of this project is recommended. Whilst aiming to consolidate the activities of the first phase, the second phase project should aim at scaling up the activities, helping to address remaining problems in the study area including the land title harmonization, and supporting the development of national emission reduction plan including national carbon right policy.

**Responsible for the Report**

Name: Lawrence Damnyag Position held: Project Coordinator

Signed:

Date: July 2016

Technical reports

The following technical reports have been attached separately from this report. The remaining technical reports have been uploaded in the POLMS in earlier reporting of project's progress reports

1. Community-based forest monitoring in REDD+ under MRV in Ankasa Conservation Area, Ghana
2. Farmer's willingness to pay for timber tree species integration on farmlands in Ankasa Conservation Area, Ghana
3. Farmer tree inventory and registration in Ankasa Conservation Area, Ghana

Annex 1: Project financial statement

Project No. **RED-PD 026/09 Rev.1 (F)** Period ending on 31st August 2016

Project Title: **Reducing Emissions from Deforestation and Forest Degradation through Collaborative Management with local communities**

| Component | Original Amount (A) | Modified Approved Amount | Expenditures To-date | | | Unexpended Amount E=A-D |
|---|---|---|---|---|---|---|
| | | | Accrued (B) | Expended ( C ) | Total D=B+C | |
| National Experts (long term) | **$122,700.00** | **$7.15** | **$0.00** | **$122,690.43** | **$122,690.43** | **$16.72** |
| *11.1 Project Cordinator* | $33,600.00 | | | $33,600.00 | $33,600.00 | $0.00 |
| *11.2 Agroforester* | $10,000.00 | | | $10,000.00 | $10,000.00 | $0.00 |
| *11.3 Forester* | $18,000.00 | | | $18,000.00 | $18,000.00 | $0.00 |
| *11.4 GIS/Remote Sensing Expert* | $16,000.00 | | | $15,983.28 | $15,983.28 | $16.72 |
| *11.5 Silviculturist* | $10,500.00 | | | $10,500.00 | $10,500.00 | $0.00 |
| *11.6 Socio-economists* | $13,750.00 | | | $13,750.00 | $13,750.00 | $0.00 |
| *11.7 Forest Technicians* | $11,250.00 | | | $11,250.00 | $11,250.00 | $0.00 |
| *11.8 Administrator* | $9,600.00 | $7.15 | | $9,607.15 | $9,607.15 | $0.00 |
| Other Personnel | **$94,550.00** | **$353.58** | **$360.73** | **$94,424.27** | **$94,785.00** | **$118.58** |
| *12.1 Driver* | $14,400.00 | $288.02 | | $14,688.02 | $14,688.02 | $0.00 |
| *12.2 Secretary* | $14,400.00 | $65.56 | | $14,465.56 | $14,465.56 | $0.00 |
| *12.3 Incentives to communities* | $65,750.00 | | $360.73 | $65,270.70 | $65,631.43 | $118.57 |
| National Consultant(s) | **$5,000.00** | | | **$4,999.88** | **$4,999.88** | **$0.12** |
| *13.1 Consultant on ecosystem services* | $5,000.00 | | | $4,999.88 | $4,999.88 | $0.12 |
| International Consultant(s) | **$10,000.00** | | | **$10,000.00** | **$10,000.00** | **($0.00)** |

| | | | | | | |
|---|---|---|---|---|---|---|
| *14.1 GIS/RS & Carbon Accounting* | $10,000.00 | | | $10,000.00 | $10,000.00 | ($0.00) |
| Component Total: | **$232,250.00** | **$360.73** | **$360.73** | **$232,114.58** | **$232,475.31** | **$135.42** |
| | | | | | $0.00 | $0.00 |
| | | | | | $0.00 | $0.00 |
| | $0.00 | | | | $0.00 | $0.00 |
| Sub-contract | | | | | $0.00 | $0.00 |
| Sub-contract | | | | | $0.00 | $0.00 |
| Component Total | **$0.00** | | **$0.00** | **$0.00** | **$0.00** | **$0.00** |
| | | | | | | |
| Daily Subsistence Allowance | **$67,900.00** | **$3,514.02** | | **$71,446.08** | **$71,446.08** | **($32.06)** |
| *31.1 National Expert(s)/Consultant(s)* | $63,900.00 | $3,514.02 | | $67,446.08 | $67,446.08 | ($32.06) |
| *31.2 International Consultant(s)* | $4,000.00 | | | $4,000.00 | $4,000.00 | ($0.00) |
| International Travel | **$22,000.00** | | | **$21,999.97** | **$21,999.97** | **$0.03** |
| *32.1 National Expert(s)/Consultant(s)* | $18,000.00 | | | $17,999.97 | $17,999.97 | $0.03 |
| *32.2 International Consultant(s)* | $4,000.00 | | | $4,000.00 | $4,000.00 | ($0.00) |
| Local Transport Costs | **$0.00** | | | **$0.00** | **$0.00** | **$0.00** |
| 33.1 National Experts/Consultant(s) | $0.00 | | | $0.00 | $0.00 | $0.00 |
| 33.2 International Consultant(s) | $0.00 | | | $0.00 | $0.00 | $0.00 |
| Component Total: | **$89,900.00** | **$3,514.02** | **$0.00** | **$93,446.05** | **$93,446.05** | **($32.03)** |
| | | | | | | |
| | **$40,000.00** | **$35,000.00** | **$5,000.00** | **$35,000.00** | **$40,000.00** | **$0.00** |
| Premises | $0.00 | | | $0.00 | $0.00 | $0.00 |
| Land | $0.00 | | | $0.00 | $0.00 | $0.00 |
| Vehicle(s) | $40,000.00 | $35,000.00 | $5,000.00 | $35,000.00 | $40,000.00 | $0.00 |
| Capital Items Equipment | **$80,300.00** | | **$3,514.02** | **$76,785.98** | **$80,300.00** | **($0.00)** |

| | | | | | | |
|---|---|---|---|---|---|---|
| *44.1 Computer Equipment (Computers, printers, etc)* | $14,000.00 | | $61.32 | $13,938.68 | $14,000.00 | ($0.00) |
| *44.2 Forestry Equipment* | $13,300.00 | | $325.24 | $12,974.76 | $13,300.00 | $0.00 |
| *44.3 Plotter* | $10,000.00 | | $43.70 | $9,956.30 | $10,000.00 | $0.00 |
| *44.4 Softwares (ArcGIS, Erdas Imagine, etc.)* | $33,000.00 | | | $33,000.00 | $33,000.00 | $0.00 |
| *44.5 Ipas (with GPS+ArcPad Software* | $10,000.00 | | $3,083.76 | $6,916.24 | $10,000.00 | $0.00 |
| Component Total: | **$120,300.00** | | **$8,514.02** | **$111,785.98** | **$120,300.00** | **($0.00)** |
| | **$80,872.00** | | **($5,000.00)** | **$85,857.99** | $80,857.99 | **$14.01** |
| Raw materials | $18,800.00 | | | $18,790.44 | $18,790.44 | $9.56 |
| Spares (Including vehicle maintenance) | $20,872.00 | $0.00 | | $20,872.64 | $20,872.64 | ($0.64) |
| Fuel & Utilities | $31,200.00 | | | $31,197.97 | $31,197.97 | $2.03 |
| Office supplies | $4,000.00 | | | $4,000.00 | $4,000.00 | $0.00 |
| Media, Publication and Education | $6,000.00 | | ($5,000.00) | $10,996.94 | $5,996.94 | $3.06 |
| Component Total: | **$80,872.00** | | **($5,000.00)** | **$85,857.99** | **$80,857.99** | **$14.01** |
| | **$33,600.00** | | | **$33,592.58** | **$33,592.58** | **$7.42** |
| Sundry | $20,800.00 | | | $20,796.93 | $20,796.93 | $3.07 |
| Audit Costs | $4,800.00 | | | $4,800.00 | $4,800.00 | $0.00 |
| Steering Committee | $8,000.00 | | | $7,995.65 | $7,995.65 | $4.35 |
| Component Total: | **$33,600.00** | | **$0.00** | **$33,592.58** | **$33,592.58** | **$7.42** |
| | | | | | $0.00 | |
| | **$59,692.00** | | | **$0.00** | **$0.00** | **$59,692.00** |
| | $59,692.00 | | | $0.00 | $0.00 | $59,692.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | $0.00 | $0.00 | $0.00 |
| | **$59,692.00** | | | **$0.00** | $0.00<br>**$0.00** | **$59,692.00** |
| **Sub-Total** | **$616,614.00** | | | **$556,797.19** | **$556,797.19** | **$59,816.81** |
| | **$103,794.00** | | | **$0.00** | $0.00 | **$103,794.00** |
| | $40,000.00 | | | $0.00 | $0.00 | $40,000.00 |
| | $15,000.00 | | | $0.00 | $0.00 | $15,000.00 |
| | $48,794.00 | | | $0.00 | $0.00 | $48,794.00 |
| | **$103,794.00** | | | **$0.00** | $0.00 | **$103,794.00** |
| | | | | | $0.00 | $0.00 |
| **Sub-Total** | **$103,794.00** | | | **$0.00** | **$0.00** | **$103,794.00** |
| **GrandTotal** | **$720,408.00** | | **$3,874.75** | **$556,797.19** | **$556,797.19** | **$163,610.81** |

Annex 2: Cash flow statement

| Project No. **RED-PD 026/09 Rev.1 (F)** Project Title: **Reducing Emissions from Deforestation and Forest Degradation through Collaborative Management** | | | Period ending on 31st August 2016 | | |
|---|---|---|---|---|---|
| Component | Reference | Date | Amount | | |
| | | | in US$ | Local Currency | |
| **A. Funds received from ITTO:** | | | | | |
| 1. First instalment | | 20th April 2010 | $169,992.00 | 239,348.74 | |
| 2. Second Instalment | | 4th March 2011 | $59,996.00 | 88,494.10 | |
| 3. Third instalment | | 9th Dec 2011 | $79,996.00 | 124,713.76 | |
| 4. Fourth instalment | | 13th Feb 2013 | $65,990.00 | 125,381.00 | |
| 5 Fifth instalment | | 18th Sept 2013 | $50,000.00 | 101,750.00 | |
| 6 Sixth Instalment | | 9th Dec 2014 | $90,000.00 | 270,000.00 | |
| 7 Seventh Instalment | | 5th Nov 2015 | $38,912.00 | 136,192.00 | |
| **Total Funds Received (A):** | | | **$554,886.00** | **1,085,879.60** | |
| **B. Expenditures by Executing Agency:** | | | | | |
| 10. Project Personnel | | | | | |
| 11. National Experts (Long Term) | | | **$122,690.43** | **212,131.75** | |
| *11.1 Project Cordinator* | | | $33,600.00 | 67,242.60 | |
| *11.2 Agroforester* | | | $10,000.00 | 15,540.35 | |
| *11.3 Forester* | | | $18,000.00 | 29,558.63 | |
| *11.4 GIS/Remote Sensing Expert* | | | $15,983.28 | 24,672.22 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | *11.5 Silviculturist* | | | $10,500.00 | 16,596.82 |
| | | *11.6 Socio-economists* | | | $13,750.00 | 21,990.25 |
| | | *11.7 Forest technicians* | | | $11,250.00 | 21,069.51 |
| | | *11.8 Administrator* | | | $9,607.15 | 15,461.38 |
| | 12. | *Other Personnel* | | | **$94,424.27** | **$178,399.21** |
| | | *12.1 Driver* | | | $14,688.02 | 22,626.55 |
| | | *12.2 Secretary* | | | 14,465.56 | 26,793.84 |
| | | *12.3 Incentives to Communities* | | | $65,270.70 | 128,978.82 |
| | 13. | National Consultant(s) | | | **$4,999.88** | **$10,898.44** |
| | | *13.1 Consultant on ecosystem services* | | | $4,999.88 | 10,898.44 |
| | 14. | International Consultant(s) | | | **$10,000.00** | **20,180.20** |
| | | *14.1 GIS/RS & Carbon Accounting* | | | $10,000.00 | 20,180.20 |
| | 19. | Component Total: | | | **$232,114.58** | **$421,609.60** |
| | 20. | Sub-contracts | | | $0.00 | 0.00 |
| | | *21. Sub-contract* | | | $0.00 | 0.00 |
| | | 22. Sub-contract | | | $0.00 | 0.00 |
| | 29. | Component Total | | | **$0.00** | **0.00** |
| 30. | Travel | | | | | |
| | 31. Daily Subsistence Allowance | | | | **$71,446.08** | **153,333.78** |
| | | *31.1 National Expert(s)/Consultant(s)* | | | $67,446.08 | 145,622.31 |
| | | *31.2 International Consultant(s)* | | | $4,000.00 | 7,711.47 |
| | 32. International Travel | | | | **$21,999.97** | **55,319.59** |
| | | *32.1 National Expert(s)* | | | $17,999.97 | 45,620.19 |
| | | *32.2 International Consultant(s)* | | | $4,000.00 | 9,699.40 |
| | 33. Local Transport Costs | | | | **$0.00** | **0.00** |

| | | | | | |
|---|---|---|---|---|---|
| | *33.1 National Expert(s)/Consultant(s)* | | | $0.00 | 0.00 |
| | *33.2 International Consultant(s)* | | | $0.00 | 0.00 |
| | 39. Component Total: | | | **$93,446.05** | **208,653.37** |
| 40. | Capital Items | | | **$35,000.00** | **49,280.00** |
| | 41. Premises | | | $0.00 | |
| | 42. Land | | | $0.00 | |
| | 43. Vehicle(s) | | | $35,000.00 | 49,280.00 |
| | 44. Capital Equipment | | | **$76,785.98** | **156,712.63** |
| | *44.1 Computer Equipment (Computers,* | | | $0.00 | 0.00 |
| | *printer, scanner, etc)* | | | $13,938.68 | 25,666.00 |
| | *44.2 Forestry Equipment* | | | $12,974.76 | 18,393.86 |
| | *44.3 Plotter* | | | $9,956.30 | 32,147.00 |
| | *44.4 Softwares (ArcGIS, Erdas Imagine etc)* | | | $33,000.00 | 57,503.77 |
| | *44.5 Ipas (with GPS+ArcPad Software)* | | | $6,916.24 | 23,002.00 |
| | 49. Component Total: | | | **$111,785.98** | **205,992.63** |
| 50. | Consumable Items | | | **$85,857.99** | **194,591.34** |
| | 51. Raw Materials | | | $18,790.44 | 43,528.27 |
| | 52. Spares (including vehicle maintenance) | | | $20,872.64 | 36,786.42 |
| | 53. Fuel & Utilities | | | $31,197.97 | 69,967.17 |
| | 54. Office Supplies. | | | $4,000.00 | 7,282.74 |
| | 55. Media, Publication and Education | | | $10,996.94 | 37,026.75 |

| | | | | |
|---|---|---|---|---|
| 59. Component Total: | | | **$85,857.99** | **194,591.34** |
| 60. Miscellaneous | | | **$33,592.58** | **88,749.32** |
| 61. Sundry | | | $20,796.93 | 49,196.52 |
| 63. Audit Costs | | | $4,800.00 | 9,820.20 |
| 64. Steering Committee | | | $7,995.65 | 29,732.60 |
| 69. Component Total: | | | **$33,592.58** | **88,749.32** |
| 70. National Management Costs | | | | |
| 71. Executing Agency Management Costs | | | | |
| 72. Focal Point Monitoring | | | | |
| 79. Component Total | | | | |
| Total Expenditures To-date (B): | | | **$556,797.19** | **1,119,596.25** |
| **Remaining Balance of Funds (A-B):** | | | **($1,911.19)** | **(33,716.65)** |