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National Forest Monitoring and Assessment of Tanzania (NAFORMA)- GCP/GLO/194/MUL

Mid-Term **Evaluation Report**

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Acronyms

ANPC	Assistant National Project Coordinator
APO	Associate Professional Officer
ARU	Ardhi University
BG	Budget Guidelines
CBD	Convention of Biological Diversity
CCIAM	Climate Change Impacts, Adaptation and Mitigation
CIDA	Canadian International Development Agency
COFO	Committee on Forestry
COP	Conference of Parties
CTA	Chief Technical Adviser
DFNR	Department Forestry and Non-renewable Resources, Zanzibar
DFO	District Forest Officer
DRM	Directorate of Resources Management
DSA	Daily Subsistence Allowance
ET	Evaluation Team
EUR	Euro (European Union currency)
FAO	Food and Agriculture Organization of the United Nations
FAO-FIN	FAO Finland Forestry Programme
FBD	Forest and Beekeeping Division
FCPF	Forest Carbon Partnership Facility
FCT	Forest Carbon Tracking
FRA	Forest Resources Assessment
GEO	Group on Earth Observations
GoF	Government of Finland
GoT	Government of Tanzania
GPS	Global Positioning System
HIV	Human Immuno Deficiency Virus
HR	High Resolution
ICT	Information and Communication Technology
IPCC	Intergovernmental Panel on Climate Change
JAST	Joint Assistance Strategy for Tanzania
LiDAR	Light Detection and Ranging
LULC	Land Use / Land Cover
MANR	Ministry of Agriculture and Natural Resources, Zanzibar
MAR	Monitoring, Assessment and Reporting
MDGs	Millennium Development Goals
Metla	Finnish Forest Research Institute
MNRT	Ministry of Natural Resources and Tourism
MoU	Memorandum of Understanding

MRV	Monitoring, Reporting and Verification
MTE	Mid Term Evaluation
MTEF	Medium Term Expenditure Framework
NAFOBEDA	National Forest and Beekeeping Database
NAFORMA	National Forest Monitoring and Assessment of Tanzania
NBKP	National Beekeeping Programme
NCCSC	National Climate Change Steering Committee
NCMC	National Carbon Monitoring Centre
NFA	National Forest Assessment
NFMA	National Forest Monitoring Assessment
NFP	National Forest Programme
NGOs	Non Governmental Organisations
NMTPF	National Medium-Term Priority Framework
NPC	National Project Coordinator
NSGRP	National Strategy for Growth and Reduction of Poverty
NTFP	Non Timber Forest Product
PBP	Performance Based Payment
PIU	Project Implementation Unit
PSC	Project Support Costs
PTU	Project Technical Unit
REDD+	Reducing Emissions from Deforestation and forest Degradation
RNE	Royal Norwegian Embassy
SADC	Southern African Development Community
SC	Steering Committee
SFM	Sustainable Forest Management
Sida	Swedish International Development Cooperation Agency
SMOLE	Sustainable Management of Land and Environment II
SNU	Sub National Unit
SUA	Sokoine University of Agriculture
SWAp	Sector Wide Approach
TaTEDO	Tanzania Traditional Energy Development and Environment Organisation
TCO	Tanzania Country Office
TFCMP	Tanzania Forest Conservation and Management Project
TFS	Tanzania Forest Service
TMA	Tanzania Meteorological Agency
TOF	Trees on Farm
ToR	Terms of Reference
TPR	Tri-Partite Reviews
TWG	Technical Working Group
TZS	Tanzania Shilling
UDSM	University of Dar es Salaam

UMB	Norwegian University of Life Sciences
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
WWF	World Wide Fund for Nature
ZWBS	Zanzibar Woody Biomass Survey

Executive Summary

In July 2008, the Government of Finland (GoF) and the FAO signed "*Agreement between the Government of Finland and the Food and Agriculture Organization of the United Nations"* for the "Strengthening Forest Resources Management and Enhancing its Contribution to Sustainable Development, Land use and Livelihoods-National Forestry Resources Monitoring and Assessment (NAFORMA) in the United Republic of Tanzania" where the GoF pledged to deliver up to USD 3,017,157. The Government of Tanzania (GoT) as counterpart contribution has committed USD 794,200 for the same three- year period in addition to contributing staff, office accommodation, computers, vehicles and inventory and mapping equipment.

After the original formulation of the project in 2007, international attention began to focus on Reducing Emissions from Deforestation and forest Degradation (REDD+) and Sustainable Forest Management (SFM) with an accompanied Monitoring, Reporting and Verification (MRV) process as a strategy to help address climate change. These initiatives were seen as having the potential for increasing funding for the forestry sector in developing countries by tapping into carbon markets.

At a Technical Workshop on 1.07.2009, stakeholders recommended revising the project's document to include REDD+, and SFM attributes and to use the concept of MRV as a means to address climate change concerns. The contributions to the project by the GoF nearly doubled with an amendment to the original agreement by USD 2,896,642 and the duration of the project extended by 8 months, in addition to the original 36 months.

The Project Document called for Tri-Partite Reviews to provide in-depth project evaluation half way through the project period and again towards the end of the project. Food and Agriculture Organization (FAO) no longer employs tripartite Mid Term Reviews, the current term review has been renamed Mid Term Evaluation (MTE). The independent Evaluation Team (ET) was directed to review the policy/institutional linkages, to assess the optimal use of NAFORMA data (biophysical, socio-economic and governance) to support SFM, REDD+ and MRV initiatives as well as to provide recommendations for how to ensure sustainability of NAFORMA. The MTE mission was performed from May 9 through May 21, 2011 in Tanzania.

The ET found that the project is relevant, conceptually sound, and well executed. The judgement of the ET is that the project is on the right path in order to contribute to the macro level goal described as "Benefits of sound forest resources management realized and mainstreamed in national economy and policies, facilitating sustainable development of rural livelihoods and meeting the MDG's" at the logical framework of the Project Document.

The organizational structure and key staff are in place to take advantage of the consultants and advisors for building the capacity within the GoT for sustained success. However, there is a risk that the NAFORMA project is collecting scientifically credible data without necessary impact to policy development and management direction. It is evident that there is a need for an analytical unit to serve strategic decision-making.

There is a pressing need to discuss and make strategic decisions on analytical unit, data sharing and data use as well as institutionalisation and the post-project sustainability. These discussions and decisions require the active participation of the Steering Committee (SC). The SC must take a more active role in the guidance of the project to ensure the long-term success and desired impacts to the Tanzanian forestry sector.

The ET found that some of the Forest and Beekeeping Division (FBD) staff have multiple roles outside of the project and that this hinders project performance. Personnel should be tasked less to other duties to ensure that capacity building of the staff takes place while National Consultants are still in the project. Also discussions with stakeholders showed that the Technical Working Group (TWG) REDD+ members were not actively attending Project Technical Unit (PTU) meetings where most of the project planning and problem solving takes place. The TWG REDD+ members have multiple roles within the government creating competition for their time. The SC and the Director of the FBD should revisit and clarify the roles, responsibilities, and commitments of the TWG REDD+ members to NAFORMA. The relationship with the REDD+ Task Force is seen as important now and will become increasingly crucial as the Task Force is replaced by the National Climate Change Steering Committee (NCCSC) and as the National Carbon Monitoring Centre (NCMC) is formed.

There is need for coordination of NAFORMA activities in relation to other parallel initiatives so that gaps and overlaps are avoided. NAFORMA must develop closer ties with Norwegian funded projects such as World Wide Fund for Nature (WWF) to maximize the utility of both projects to support REDD+. The available FAO-FIN technical support and backstopping should be utilised for land cover change mapping.

Individual capacity building has taken place to some degree but the project remains heavily dependent on international and National Consultants, and the CTA to provide substantial technical leadership in the project planning, implementation and reporting. These post-project sustainability issues should be addressed in a written exit strategy document that is approved by the SC to ensure a smooth transfer of technical expertise.

The ET believes that the Tanzania Forest Service (TFS) is the most feasible option to carry on NAFORMA post-project roles and functions. Once the NCMC is operational, there should be a person who is directly responsible for the interaction between NAFORMA and NCMC to ensure that the needs of the NCCSC are met. The FBD/TFS should develop partnership agreements and contracts with academic institutions, Non Governmental Organisations (NGOs), and private sector to formalise linkages and synergies as well as to execute outsourced tasks. One example of collaboration is with the Climate Change Impacts, Adaptation and Mitigation programme (CCIAM) coordinated by the Sokoine University of Agriculture (SUA) to produce biomass estimation models for carbon monitoring. Before detailed data is available simple equations and IPCC default parameter values can be used.

The budget shortfall should be addressed by reviewing whether the field crews size can be further reduced as NAFORMA moves into areas that are more roaded and easier to survey. If needed, seek funds first from GoT and then from other organizations that

have a stake in the project's success**.** Follow the performance of field data collection and carefully monitor expenditures to avoid future budget deficits.

The FAO-FIN Forestry Programme should begin discussions with GoT for a second phase of support for NAFORMA within the FAO-FIN Tanzania Component 2. Post-project NAFORMA discussions should include organisational structure, function carried by TFS/functions outsourced, budget, synergies and collaboration with other institutions and partners.

Post-project financial arrangement among GoT, GoF, and FAO-FIN should begin now to transition from primarily a development partner funded project to a GoT funded project. A financial plan for the next three-years needs to be developed using the Medium Term Expenditure Framework. The discussions on annual work plan and budget budgeting process for the next year should start in October when Budget Guidelines (BG) are prepared with periodic discussions continuing up to March 15 when budget submissions are due.

In general, it is important to maintain a dialogue between users and producers of information to ensure that data collection will remain demand-driven. The synergies with other projects that are trying to link reference data (field plots) with remotely sensed data should be encouraged and strengthened.

The NAFORMA project is heavily dependent on International and National Consultants. Database development has been done entirely by FAO-FIN at FAO HQ in Rome. Data entry at FBD has been delayed due to database development with some basic functions not working properly. Urgent action on Database development is needed. The continuity of post-project FAO technical support should be clarified.

Field data quality needs improvement although the quality varies by type of survey. There is a good system of QA for the biophysical field data though there are some data quality problems and the data quality for the socioeconomic and the local governance is low. Training must emphasize understanding of the question and the importance of filling the form completely or documenting why the data is missing. The training must also include testing for comprehension.

The field data has been stored on individual computers with no regular back-up off site. This poses a grave risk to the approximately USD 400,000 invested in the data already entered. It is critically important that a back-up plan be implemented including the storage of the back-up medium off-site to safeguard the data in case of a building failure such as a fire.

A data sharing policy and protocols should be created for sharing biophysical information and processing requests for interview data. The ET strongly advises that the raw interview data must not be distributed outside of the project to protect the confidentiality of the individuals although summary information should not have these restrictions. Notwithstanding the data sharing policy, the data should be made accessible, preferable through web interface.

The analysed NAFORMA data should be linked the National Forest and Beekeeping Database (NAFOBEDA). NAFOBEDA was developed to be the main method to monitor the impact of management activities on forests at both national and local

government levels, but routine procedures have not been followed and the database has largely remained inactive. An external study should be carried out to get more detailed information about NAFOBEDA functions and a way forward.

1 Introduction

1.1 Evaluation background

The objective of the Mid Term Evaluation (MTE) is to benefit the National Forest Monitoring and Assessment (NAFORMA) project in Tanzania by providing the necessary guidance and direction for the sustainable, successful and timely completion of the project work. By securing the project's continued progress, the MTE should also help the various partner institutions and eventually the nation of Tanzania when the data and reports from NAFORMA are utilized in promoting sustainable forest management (SFM).

The Project Document called for Tri-Partite Reviews (TPR) to provide in-depth project evaluation half way through the project period and again towards the end of the project. Food and Agriculture Organization (FAO) no longer employs tripartite Mid Term Reviews, the current term review has been renamed Mid Term Evaluation (MTE). An independent Evaluation Team (ET) has been appointed and directed to review the policy/institutional linkages, to assess the optimal use of NAFORMA data (biophysical, socio-economic and governance), including relations to Reducing Emissions from Deforestation and forest Degradation (REDD+) Monitoring, Reporting and Verification (MRV) needs as well as to provide recommendations for how to ensure sustainability of NAFORMA.

The MTE mission was performed from May 9 through May 21, 2011 in Tanzania. The amended itinerary can be found in Annex III. The first draft was due May 31, 2011 for review by GoT, GoF and FAO for comments and the final report within 5 days upon receipt of the comments.

The Project Document was compiled in 2007, the Project Agreement was signed in 2008 and the revised Project Document and the Project Agreement signed in late 2010. The GoF, originally committed EUR 1,929,593 to the project over the initial three-year period and committed an additional EUR 2,000,000 in the end of 2010 due to the substantial expansion of NAFORMA´s scope. The GoT as counterpart contribution has committed USD 794,200 for the same three-year period. GoT also contributes staff, office accommodation, computers, 8 vehicles and some inventory and mapping equipment.

FAO provides the logistical framework and technical support for developing methodologies and tools, and procurements.

1.2 Methodology of the evaluation

The MTE conducted a structured evaluation of relevance, efficiency, effectiveness, impact and sustainability of the NAFORMA activities. NAFORMA efforts to mainstream gender and Human Immune Deficiency Virus (HIV) awareness were also evaluated. The team specifically evaluated the project in these five main areas:

1) Project progress with respect to expected outcomes,

2) Project organisational setup, key person functions, and work plans of the Technical Working Groups (TWGs) with a view to sustainability in the post project period,
3) Project budget and assess sufficiency of remaining funds to reach targets,
4) Project synergies with related activities, and
5) Progress in securing institutional memory and building national capacity with special emphasis on continuity in the post project phase.

The detailed Terms of Reference (ToR) are shown in Annex II. In addition, the ET reviewed 32 project documents (Annex V) plus numerous others from related projects and FAO reports. The ET met with 49 people (Annex III) and interviewed many of these as key individuals to provide a better understanding of the project performance, relationship to external organisations and to solicit improvements. The ET conducted a field visit to a permanent sample cluster to observe a field crew implementing the protocols of the field manual to the biophysical survey. As part of the review, the ET also visited the data entry and remote sensing facilities.

2 Context of intervention

2.1 National context

In 1998, the Government approved the National Forest Policy which is currently being updated. The overall goal of the 1998 policy is to enhance the contribution of the forest sector to the sustainable development of Tanzania and the conservation and management of her natural resources for the benefit of present and future generations. This policy focuses in four areas:

- Forest land management,
- Forest-based industries and products,
- Ecosystem conservation and management, and
- Institutions and human resources.

The objectives of the forest sector on the basis of the overall goal are as follows:

1) Ensure sustainable supply of forest products and services by maintaining sufficient forest area under effective management,
2) Increase employment and foreign exchange earnings through sustainable forest-based industrial development and trade,
3) Ensure ecosystem stability through conservation of forest biodiversity, water catchments and soil fertility, and
4) Enhance national capacity to manage and develop the forest sector in collaboration with other stakeholders.

Challenges to accomplishing these objectives are the facts that about 38% of the Tanzania's 886,000 km^2 total land area is covered by forests and woodlands. These forests are however faced with deforestation and degradation at a rate of 403,000 ha per annum between 1990 and 2010 (FAO 2010), which results from heavy pressure from agricultural expansion, livestock grazing, wild fires, over-exploitation and

unsustainable utilisation of wood resources and other human activities mainly in the general lands.

The National Forest Programme in Tanzania 2001 - 2010 (NFP) was written in November 2001 as an instrument for implementing the National Forest Policy which was approved in 1998. The NFP has identified inadequate data on available forest resources for utilisation and forest biodiversity as key issues. The report also identified inadequate analysis, interpretation and dissemination of the data as other shortcomings. Key strategies to address these issues call for conducting forest inventories, establish new, cost-effective ways to conduct and prepare forest reconnaissance inventories, and biological surveys.

The NAFORMA project was created to address the issues raised in the NFP and is within Forestry and Beekeeping (FBD) Division of the Ministry of Natural Resources and Tourism (MNRT). The other technical divisions of the MNRT are Wildlife, Fisheries, Tourism and Antiquities. In the future NAFORMA will be placed at the Tanzania Forest Service (TFS), which has been established to take over some of the operational roles and functions of FBD.

2.2 Origins of the Project

The FBD of the MNRT has earlier conducted different management and reconnaissance forest inventories and land use management classifications (See Table 1).

Table 1: Previous major forest inventories

Year	Type of Inventory	Coverage	Support
1971 – 73	Reconnaissance	Kilimanjaro, Tanga, Kilombero, Tabora and Mtwara	CIDA
1975 – 77	Industrial by Jaakko Pöyry	Do	GoF
1996	Reconnaissance	Singida, Arusha and Dodoma	Sida
1999	NFP	Tanzania	FBD
1998	Management	Kiteto (SULEDO)	Sida – ORGUT/FORCONSULT
1996-2000	Reconnaissance	Selected Catchment forests	NORAD/FBD/FORCONSULT
2005	Reconnaissance	Eleven districts	World Bank/FBD/FORCONSULT
2003	Management	Babati (Duru Haitemba)	Sida ORGUT

Year	Type of Inventory	Coverage	Support
2007	Sandalwood	10 Districts	FBD/FORCONSULT

These inventories were focused on either certain areas of the country or had very specific objectives. A general awareness began to emerge that these inventories, while successful in meeting their immediate needs, were not adequate in meeting the national strategic needs for SFM. This awareness began with the National Forest Policy report of March 1998 and the subsequent NFP in Tanzania 2001-2010.

In July 2008, the GoF and the FAO signed "*Agreement between the Government of Finland and the Food and Agriculture Organization of the United Nations"* for the "Strengthening Forest Resources Management and Enhancing its Contribution to Sustainable Development, Land use and Livelihoods-National Forestry Resources Monitoring and Assessment in the United Republic of Tanzania" where the GoF pledged to deliver up to USD 3,017,157. After the original formulation of the project in 2007 the 13th Conference of Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC) in Bali in 2007 brought forests and trees to the centre of the international climate change agenda. There are high expectations from REDD+ for reducing emissions in ongoing UNFCCC COP negotiations. REDD+, and carbon markets in general, are perceived as having significant potential for increasing funding for the forestry sector in developing countries. However, the perspective of a REDD mechanism is also highlighting the need for more accurate information on forest resources and for appropriate methods for achieving SFM in these countries.

Additionally, REDD-related initiatives, such as UN-REDD, the Forest Carbon Partnership Facility (FCPF) and Forest Investment Programme (FIP) by the World Bank, and the voluntary carbon trade market and private financing in REDD will require commonly agreed and reliable MRV-systems. In this environment with increased REDD+ MRV needs and in accordance with the recommendations from stakeholder consultations (see, Information Needs and Inventory Design, Proceedings from the NAFORMA Technical Workshop 2, 30.6-1.07.2009) – it was decided to revise NAFORMA's approach.

Due to these additional needs, the contribution of the GoF nearly doubled with an amendment to the original agreement by USD 2,896,642 and the duration of the project extended by 8 months, in addition to the original 36 months.

Although the NAFORMA has been bilaterally funded by GoF it has been under the management of FAO Finland Forestry Programme (FAO FIN), which has provided the technical assistance for the development of the methodology and backstopping support. The FAO FIN Programme aims at strengthening the FAO resources and capacity in methodological and tool development at the HQ in Rome and in the five participating countries, including Tanzania.

2.3 Finland's comparative advantage

Finland's active role in global forestry development is based on the fact that the forest sector has an exceptionally high importance in the national economy. The forest cover in Finland is more extensive than in any other European country, a total of 23 million ha representing 76% of the land area. Finland's national well-being is based on the sustainable use of forests and other natural resources, a high level of science and technology, good governance and strong democracy, as stated in the Finnish Development Policy Guidelines for Forest Sector.

The development of forest resources in Finland is monitored in the National Forest Inventory (NFI) maintained by the Finnish Forest Research Institute (Metla). The NFI generates annually updated information on the state of Finland's forests. The first systematic inventory of forests was conducted in 1921–1924. It was among the first inventories in the world based on statistical sampling. Since then NFIs have been made regularly in 5-10 years cycles. According to the latest forest statistics based on the 10th NFI the forest area has remained almost unchanged over the last 50 years whereas the volume of growing stock has increased by more than 40%.

Finland has a long history in the forestry sector development cooperation in Tanzania. In the last ten years, the assistance has included the support to the forest policy development as well as the preparation and implementation of the NFP (2001-2010). Globally, Finland has played a crucial role in the establishment of the UNFF and the Collaborative Partnership on Forests (CPF). Finland has inherent comparative advantage in providing support for SFM, specifically in Tanzania as Finland's longest standing partner in development cooperation since 1962.

3 Assessment of project concept and relevance

3.1 Project Theory

3.1.1 Introduction

NAFORMA has adopted result-based management to help ensure a clear connection between actions and results. This conceptual approach (logical framework, Annex IV)), views 'impact' as the final step in a linear 'chain' of results that are undertaken to achieve the project's over-all goal. The logical framework suggests that an intervention's inputs lead to activities, which generate outputs, and then outcomes and which ultimately lead to impacts. Definitions for these terms are below:

> *Goal:* The higher-order objective to which a development intervention is intended to contribute.
>
> *Inputs:* The financial, human and material resources used for the development intervention.
>
> *Activity:* Actions taken or work performed through which inputs, such as funds, technical assistance and other types of resources are mobilised to produce specific outputs.

Outputs: The products, capital goods and services which result from a development intervention.

Outcomes: The likely or achieved short-term and medium-term effects of an intervention's outputs.

Impacts: Positive and negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended[1].

The basic question is whether the sequence of activities has clear underlying logic or 'theory of change' explicit, not over-ambitious and based on a solid understanding of resource needs. Impact can be defined in various ways, but it is most important to clarify its meaning in ways that are specific to particular interventions or contexts, and that enable practical implementation of an effective assessment[2].

3.1.2 Project review

The project document has a goal of "to assist FBD in developing sustainable forest management in Tanzania" followed by four development objectives on page 4 of the project document while on page 26 there is a listing of five project impacts, many of them identical or nearly so to the development objectives listed on page 4. Furthermore, in the Logical Framework in Appendix 3, there is only one impact and it is defined as:

"Benefits of sound forest resources management realized and mainstreamed in national economy and policies, facilitating sustainable development of rural livelihoods and meeting the MDG's".

There appears to be confusion between goals, objectives and impacts as well as a failure to update the Logical Framework when the project was amended to include REDD+ MRV initiatives.

The 'impact' defined above appears to be the goal for the project prior to its amendment. Note that it does not address REDD+ MRV issues. The goal for the current project is unclear having been replaced by several impact statements. These are:

1) contribute to the sustainable natural resources management and utilisation through improved, efficient and cost effective forestry-related activities,
2) facilitate the sustainable development of the country,
3) facilitate improved REDD+ readiness,
4) improve the productivity of the rural livelihood, and
5) mainstream the benefits of better forest resources management in national economies and policies for better involvement of women, alleviation of poverty and meeting the MDGs.

[1] Source OECD-DAC, 2010 (http://www.oecd.org/dataoecd/29/21/2754804.pdf)
[2] ALNAP 8th review of Humanitarian Action Chapter 2 (http://www.alnap.org/pool/files/8rhach2.pdf)

Although they are labelled as 'impacts', numbers 1), 2), 4) and 5) seem to be goals more appropriate for a national level plan such as the United Nations Development Assistance Plan for Tanzania. As impacts, they are overly ambitious in the sense that they are many other sequences of activities that play an important role in having an effect that are beyond the scope of this project. Consequently, the logical bridge between the immediate project centric objectives and the desired impacts are weak. There is too much of a gap between the outputs from the project and the impact objectives. For these reasons, it is better to assess the specific objectives of the project and whether they are consistent with contributing to impacts in the long-term. The specific objectives can be found in Section 3.2.

Several of the objectives in Section 3.2 include governance as part of REDD+ and MRV. Although the UNFCCC has yet to decide on the formal requirements for social and environmental safeguards, NAFORMA has reviewed their original socioeconomic survey against three widely used forest governance reports (Anderson et al. 2010) and has included seven additional questions so that the survey now addresses 80% of the unique questions from the three governance reports. This approach seems reasonable to the ET.

The linkages from the socioeconomic survey to the REDD+ MRV are by their very nature, less clear. The relationship between practices and local governance as obtained by the socioeconomic surveys and the biophysical measurements while innovative, are not as strong as the biological relationships especially when influences external to the two-kilometre radius circle are present. A basic assumption with the socioeconomic survey is that the people within the two- kilometre radius circle are responsible for any human impacts recorded on the plot. Even with the inclusion of questions that attempt to separate the presences of influences external to the circle from those within the circle, there is a confounding effect between the two since the quantification of each influence is not possible. Hence, the linkages between activities to outputs to objectives for REDD+ impact goals should be seen as an evolutionary process that will change as better linkages between the questions and the impact goals are developed.

The degree of innovation found in this project is significant. Below are the major areas of innovation:

- Sample design. The use of auxiliary data such as estimated times for the major portion of the field procedures, existing map layers, double sampling for stratification to estimate the area and a form of optimal allocation to distribute the plots across the strata,
- Instituting a sample-based approach to socioeconomic questionnaires, and
- The ability to model the relationship between the results from the socioeconomic questionnaire and the biophysical survey.

NAFORMA has significant applications to other tropical countries to being one of the first countries that is trying to adopt the biological and the socioeconomic data to support the REDD+ MRV. It is also testing a different sample design than the standard forest inventory design previously supported by FAO. Due to these innovations,

NAFORMA will be a rich source of information to other countries as the basis for further development of REDD+ techniques and statistical efficiencies.

The NAFORMA approach includes systematic data on TOF, identification of forest products and services derived from sample areas, property rights and policies associated with such products and services, as well as the socioeconomic and institutional characteristics of forest use and users. One of the potential advantages of the National Forest Monitoring Assessment (NFMA) approach, according to Tomppo and Andersson (FAO 2008a), is that the inclusion of data on the human use of the forest resources surveyed allows national forest policy analysts and decision makers develop knowledge about the factors that affect the changing forest condition in a country, something that traditional NFIs could not deliver. Such knowledge makes it possible to monitor the effects of previous policy efforts and to develop alternative policy instruments that are more effective in achieving the national forest policy goals.

3.2 Project objectives and logical framework

The project logical framework (Annex IV p. 49 of the Project Document revised in November 2010) indicates that the project goal as: "*Benefits of sound forest resources management realized and mainstreamed in national economy and policies, facilitating sustainable development of rural livelihoods and meeting the MDG's*." The goal is normally one and the mention of 4 and 5 project goals in the same Project Document (p. 4 and p. 26) should be taken as a conception mistake. Project progress reports have been using 4 goals. The goal is macro level and a sole project cannot pretend to achieve it, but only hopes to contribute to it.

Further, the project logical framework has one outcome: "*Capacity of FBD to manage forest resources with a landscape and livelihoods focus strengthened. Policy dialogue at national level, particularly when addressing the broader development agenda, is better informed about forest resources, their management and uses. Mainstreaming of forestry facilitated*". The ET considers the project outcome relevant to contribute to the project goal and is achievable within the project period.

According to the Project Document revised in November 2010, NAFORMA has the following seven specific objectives:

1) Establish a broad consensus at the national level on the process and approach to NAFORMA in Tanzania, taking into account national users information requirements for planning and sustainable management of the forestry resources and the country's obligation of reporting to the international processes,
2) Strengthen the capability of the FBD to collect, analyze, update and manage the needed information on forests and trees under National Forest and Beekeeping Database (NAFOBEDA),
3) Develop a national database/dataset on forests and trees compatible with NAFOBEDA and other forestry related information systems,
4) Prepare national maps of forests and land uses based on harmonized classification and forest related definitions, with compatible storage and retrieval under NAFOBEDA,

5) Undertake a national assessment of the forest and TOF resources with the aim to create an information base according to national (NAFOBEDA) and international requirements and to set up a long term monitoring system of the resources,
6) Define long term monitoring programme of the forestry resources, design specific and management oriented inventory in priority areas and formulate projects, and
7) Develop tools and methods for integration of REDD+ MRV to NFMA methodology.

The original project document formulated in 2007 had only six specific objectives. After project approval, monitoring carbon has gained greater priority in the context of reducing greenhouse gas emissions from REDD+. This resulted in addition of objective 7 following recommendations of a stakeholder workshop held mid 2009. In addition, it was agreed that the inventory data should provide data that can be useful at Sub National Unit (SNU)-level i.e. district level, where most of the development activities take place. Overall, the ET considers the specific objectives relevant and contribute to achieving the project outcome. The decision to have the inventory data useful at district level or lower levels is also considered by the ET as appropriate, as the availability of inventory data at that level would improve district forestry development programmes.

The project has a total of 12 outputs for the 7 objectives. The ET considers all the project outputs appropriate to achieving the project objectives. At the time of MTE, some of the outputs have already been achieved. There a total of 35 activities being done to produce specific outputs. All the activities are considered by the ET as appropriate and at the time of MTE, several of these have already been implemented. The inputs (financial, human and material resources) were well planned in the Project Document. Change of project methodology after initial project approval has made it necessary to revise some of the inputs as detailed in various parts of this reports. The ET concurs with the revisions so that the expected outputs can be achieved. Assessment of the indicators by the ET shows that they are relevant and appropriate. The assumptions and risks are valid.

3.3 Project design

A Chief Technical Adviser (CTA) appointed by FAO provides technical assistance and support to FBD in areas of capacity building, institutional strengthening, planning and implementation of the NAFORMA project. The CTA is supported by National Consultants in Inventory, Mapping and more recently Database Management. There are ToR for all the various positions indicated above.

3.3.1 Institutional set-up

The project is within the FBD of the MNRT. The FBD has the overall responsibility while FAO provides technical backstopping and management support to ensure a high standard of implementation and to facilitate interactions with related international development partners and organisations.

The FAO has been contracted to facilitate the implementation of the project due to its international knowledge and experience in forestry resources assessment and

development (NFMA programme). It provides national and international consultants for capacity building, forest assessment, remote sensing and mapping, information system development and data processing, quality assessment (QA) system and soil carbon monitoring etc. FAO administers the technical assistance and provides operational and technical backstopping services from its offices in Dar es Salaam (FAO Representative Office to Tanzania), Accra (Regional Office) and Rome (FAO Headquarters).

FAO has sufficient knowledge, more than 60 years of experience, global leadership, and institutional networks to provide support to countries to strengthen their capacity and improve their forest resource management. Furthermore, countries through their recommendations in various sessions of the Committee on Forestry (COFO) and FAO Council continue to mandate FAO to do so. For example, COFO 2007 requested FAO, in collaboration with Members and partner organisations, to continue to support national monitoring, assessment and reporting on forests, including their social, economic and environmental benefits. The Committee urged Members, FAO and other partners to enhance international collaboration in this field, taking into account national specificities. This would help to bridge the gap between knowledge and policy and would improve SFM. It would also help to achieve the four Global Objectives on Forests agreed by the United Nations Forum on Forests (UNFF) at its Sixth Session, and to mainstream forestry within efforts to eradicate extreme poverty and hunger, achieve sustainable water and land use, mitigate climate change and to achieve the Millennium Development Goals (MDGs).

In order to respond to the growing needs of information about forest resources and carbon stocks at country and global levels GoF is funding the programme “Sustainable Forest Management in a Changing Climate” GCP/GLO/194/MUL which is integrated within the FAO Forestry Department’s operational framework. The programme is supporting five pilot countries to build their national capacity to monitor and assess forest resources for national decision making processes. By supporting GCP/GLO/194/MUL in Tanzania, FAO FIN is also supporting Goal 4: Ensuring Food and Nutrition Security, Environmental Sustainability and Climate Change Adaptation and Mitigation and strategy viii “Enhancing SFM for improved governance, livelihoods, forest conditions, resilience of forest ecosystems and trees” in the Tanzanian’s National Strategy for Growth and Reduction of Poverty II (NSGRP or MKUKUTA II in Kiswahili).

The NAFORMA project receives the benefit of FAO FIN resources and capacity in methodological and tool development at the HQ and as does other participating countries. The FAO FIN Programme is developing new methodologies using cutting edge technology, especially in remote sensing and data analysis, having a special emphasis on cost efficiency. The support of GoF is especially targeted within the new Strategic Framework for FAO to the strengthening the information base for SFM, which was defined in by the Conference Committee in November 2008 for one of the areas where extra-budgetary resources was needed.

FAO partners with United Nations Environment Programme (UNEP) and United Nations Development Programme (UNDP) in the joint UN-REDD Tanzania Programme which is executed alongside NAFORMA and therefore is able to ensure synergies between NAFORMA and UN-REDD activities.

The NFP stated that the existing Steering Committee (SC) to have wider guidance of stakeholders, will be broadened to include representation from more stakeholders for cross sectoral linkages. This is seen as important as NFP moves into the implementation stage. A multidisciplinary SC was created to provide this oversight for all the projects under the NFP and it should meet periodically every three months or more frequently when needed. The composition of this committee is listed below:

- MNRT,
- Vice President's Office –Environment,
- Prime Minister's Office - Regional Administration and Local Government,
- Ministry of Water and Livestock Development,
- Ministry of Agriculture, Food Security and Cooperatives,
- Ministry of Finance and Planning,
- Local and International Community,
- Civil Society Organisations,
- Teaching and Research Institutions,
- Non Governmental Organisations (NGOs),
- Other Government Institutions e.g. Tanzania Investment Centre, Survey and Mapping Division and National Land Use planning Commission,
- Private Sector,
- Development Partners (Finland, Norway, Denmark, Belgium, UNDP), and
- FAO.

The SC is composed of wide range of stakeholders including development partners (donors and FAO). Under the Trustee Agreement, the progress of the project will be reviewed and scrutinized, its achievements assessed against the planned outputs, its work plan for the next periods analysed, the actions to take in case of constraints identified and responsibilities assigned. The SC will also work to insure broad awareness about the project and will act to foster the sharing of generated knowledge. The importance of having a SC that crosscuts different sectors is essential for the project's success by disseminating the information generated to all relevant institutions.

It is Government policy that all interventions/projects under the NFP should be included in a Sector Wide Approach (SWAp) to encourage coordination across projects. The concept of SWAp is also included in the recently published *United Nations Development Assistance Plan* (UNDAP) for the period July 2011- June 2015. There is little evidence that the GoT has implemented a SWAp in forestry even though such a plan would be of significant help to coordinate and avoid duplication of efforts across projects. It is a missed opportunity that a SWAp does not exist and it is logical that the SC would be responsible for its development and implementation.

The data generated and the analysis produced from NAFORMA will help policy makers in several ways by:

- Helping define government policy in the area of knowledge generation, management and dissemination,
- Assisting FBD in developing SFM,
- Producing forest monitoring and assessment reports and remote sensing studies at the national, regional and international levels,
- Producing NFA data for making a National Forest Policy review and analysis and to know the policy impacts, and
- Mainstreaming the involvement of women.

All of these points support the NFP vision of "the NFP process in Tanzania is to reduce poverty and increase economic growth by managing forests sustainably without compromising environmental and cultural values."

The paragraphs above are edited versions from the Trust Fund Agreement between the GoT and FAO. The findings of ET are that the SC has met two or three times since the inception of the project. This is clearly less than the "periodically every three months or more frequently when needed". The judgment of the ET is that the objectives to have the SC review achievements against performance, provide guidance, and disseminate the accomplishments of NAFORMA are sound. The ET believes that although more frequent meetings have not been realized, NAFORMA has met with the SC whenever the Project Management has requested a meeting (personal communication CTA).

While the project has excellent support from international technical advisors, there is no apparent unit or units that will do the analysis necessary to help achieve these goals in the long term. Plans are underway for FAO HQ to provide analytical support to the project in the short term. This assistance is essential to show the stakeholders the potential uses for the data but the needs for FBD to support SFM planning and assess policy impacts at the regional and national level requires a flexible approach with knowledgeable people in the area of biometrics. This need for an analytical unit is separate from those of the NCMC. It is assumed that the NCMC will possess the technical expertise to analyze NAFORMA data for their own purposes.

This role could be contracted to external party but the need for the expertise will be continuous. There are several options to consider: establishing a long term relationship with a contractor to provide these services; develop a small analytical unit within the FBD; or establish a small unit within FBD but have formal arrangements with SUA and FAO FIN to act as consultants as the need arises. Although any of these options could work, the ET favours the last option as being the most robust to changing analytical methodologies and technological advances. The establishment of the unit would require outside expertise such as those provided through FAO FIN.

Without discussions with SC on the organizational structure, composition and location of the analytical unit, the project is running the risk of collecting scientifically credible data, providing summary reports but not influencing management direction. To be clear, the ET is not advocating that NAFORMA accept these roles but for the long term success of achieving the desired impacts, the FBD and the SC need to take up this issue now.

3.3.2 Management arrangements

The national focal point for the project is the National Project Coordinator (NPC) who is appointed by the Director of FBD and is responsible for the overall planning, managing, coordinating and supervising the project activities. An Assistant National Project Coordinator (ANPC) reports to the NPC and has the daily management responsibility of the fieldwork component of NAFORMA. The NPC is the head of PTU assisted by the ANPC. Each Technical Working Group (TWG) is headed by a forest officer who is supported by a national consultant and international technical advisors from FAO-FIN. The TWG heads each lead a number of technicians whose tasks are data collection, data entry and satellite mapping.

There is a fourth Technical Working Group of REDD+ compliance that is associated with the project but reports to the REDD Manager within the MNRT. This fourth TWG was added as a result of initial stakeholder workshop and information needs assessment in 2009 and the 13th COP of the UNFCCC in 2007. This conference brought sustainable forestry development to the centre of the international development agenda and with it, high expectations for REDD+ in development countries.

There is a Project Technical Unit (PTU) committee composed of the NPC, ANPC, managers of the TWG and their national or international consultant counterparts. The PTU's primary purpose is to highlight issues for resolution and to coordinate work flow to achieve project objectives. It is within the PTU where team work is fostered.

The technical assistance offered by FAO-FIN forestry programme has been timely, well qualified and effective. The NAFORMA staff is very appreciative of the high quality of assistance offered by the FAO technical advisors. FAO Rome has made regular backstopping visits to assess progress and with NAFORMA management determine the skills needed by the technical advisors.

With the exceptions of the relationship between the SC and the project and the apparent lack of a long-term plan for an analytical unit, the ET has found the organizational structure sound and does not need changing.

3.3.3 Approach and methodology

According to the Project Document the overall strategy of the project is to work in collaboration between FAO, the FBD and the Development Partners (donors) and organisations, to develop, promote and implement management tools to bridge the gap between knowledge generation and policy processes with emphasis on inter-sectoral coordination with all donors engaged in support of other forestry activities in Tanzania. The project strategy plans to make use of information exchange between various projects and sectors, to ensure technology transfer and to build national capacity.

The project aims to be fully integrated into the existing planning and management processes to ensure that FAO can best assist the GoT in meeting its priorities in forestry, including:

1) meeting the MDGs targets,
2) integrating forestry issues within the larger context of sustainable development,

3) contributing towards Strengthening Monitoring, Assessment and Reporting (MAR) on SFM,
4) harmonizing the methods and techniques of forestry resources assessment in Tanzania as well as the information framework, and
5) strengthening FBD to enable it to carry out future updating of NAFORMA, promote modern techniques and integrated approaches, support exchange and sharing of information and expertise, insure transfer of technologies, provide training when required, develop national norms of forest inventory, assessment and monitoring while insuring coherence between global, regional, sub-regional and the underlying country priorities.

The original NFMA design is based on latitudes and longitude where each plot is placed on the intersection of the chosen arc. This produced a systematic design across the landscape with provisions for stratification based on known strata areas. The primary sampling unit is a square tract of 1 x 1 kilometre. Each sampling unit contains a cluster of four permanent, rectangular, half-hectare sample plots that are 20 x 250 metres, placed in perpendicular orientations. Smaller sub-units are delineated within each plot: three sets of subplots, three measurement points and three fallen deadwood transect lines. No provisions beyond the broad stratification are made to optimize the design.

The design described below does take into account several key factors to produce a stratified cluster design where each cluster contains a number of plots such that a cluster can reasonably be completed within one day. The number of plots in a cluster is constant within a stratum but varies depending on factors such as accessibility and estimated volume.

There are three basic methodologies employed to collect and analyze the data to achieve the specific objectives described in section 3.2. A synthesis of the approach taken by NAFORMA for the biophysical is found in Annex I. A discussion and comments on the three methods are described below.

Biophysical:

The inventory design uses the best available information and substitutes data from elsewhere when information from Tanzanian data were not available. It has a sound theoretical foundation and can be tailored to other countries preferably when data similar to Hunting vegetation map and layers for elevation, river and roads are available. These ancillary data sources improve the efficiency of the design and without the road layer, the creation of an efficient design is in doubt.

To develop a sample design, the statistician must accept a number of assumptions. A diligent statistician chooses assumptions that will not bias the results if these assumptions prove to be incorrect. All of the assumptions in this design are based on the best available information and will result in unbiased estimates even if some of these assumptions prove to be not completely correct. As an innovative aspect of this design, the field data collection forms have provisions to collect actually times when the crews left the vehicle, arrived at the plot, left the plot and when they arrived back at their vehicle. This time data along with actual distances travelled from the vehicle to the cluster can evaluate the assumptions in the design and can be used in other similar

tropical countries. This is just one set of assumptions that can be checked, others such as developing equations to predict volume from field plots in Tanzania and satellite imagery is another.

A critical evaluation of the biophysical data collected between May and September 2010 was done by a consultant (Shemwetta 2010) in order to identify any possible adjustments.

The following types of errors were identified in the submitted data:

- Missing data – blanks. Empty data cells indicate an omission of a required data,
- Text data in numerical field,
- Mixture of text with numbers e.g. bole height = 6 m,
- Wrong entry – e.g., time on plot number field,
- Inconsistency e.g., true/false or Yes/no; decimal points,
- Unusual tree form where there is a mismatch between dbh and tree height,
- Misleading: e.g. termed at inaccessible plot but with recorded observations; record of time hh:mm:sec instead of plot number,
- Unknown code; e.g. 200 for a vegetation type,
- Odd (unrealistic) entries e.g. tree length of 86 m, 94 m,
- Others such as more than one decimal point, or start time at 03:00.

For mitigating the most common sources of errors, the Consultant gave the following recommendations:

- Field and Database recorders should be aware of the intended use of the data,
- All fields and all data cells, as designed in the field manual, must be filled,
- Accuracy in measurements and observation should be of utmost importance,
- Recording in the field should be guarded against wrong entries. “Repeater” or “echo” culture should be the norm,
- Field data should be entered into the database as soon as possible to accommodate correction of errors in good time,
- The Database should be smart enough to query or reject unusual entry,
- There should be in-built mechanisms for data authentication (counter-checks) within the data collection and data entry procedures,
- The there should be a mechanism for Datasets to be able to link together. For example the vegetation type code should be filled in ALL forms,
- The database could be improved to start generating some preliminary results such as species list,
- The QA team is a crucial component and has a major role to play in minimizing errors at all stages of data collection and entry.

The ET concurs with the conclusion of the Consultant that more attention to data quality during field data collection and tightening of data entry activities is key for NAFORMA project to realize its objectives. The ET was informed that the Consultant recommendations were discussed in a workshop involving all field and data entry crews, and that they are being implemented.

Socioeconomic:

The *Field Manual for Socioeconomic Survey (M05-2010)* states that the survey is designed to be collected in conjunction with the biophysical survey to strengthen the explanatory power and policy relevance of the data. Another objective is to produce an unbiased sample of the population of interest by linking it to the biophysical sample design. Data is collected on all permanent plots and one-third of the temporary plots selected by the field team management. Using a combination of high-resolution imagery and key informants, the four households nearest to the centre of a two-kilometre radius circle that includes all of the biophysical field plots are selected for interviews and an additional three households that are the next closest to the centre are also identified as backup households in the event that one or more of the original four households cannot be interviewed. As part of the interviewing process the key informants are asked a series of questions including the number of households that are within the two kilometre radius circle.

It is recognised that linking the socioeconomic with the biophysical survey offers the potential for relating physical measurements with societal values and governance concerning the resources and that this linkage is innovative and rare in the forestry resource realm. As such, the socioeconomic survey should be seen as a testing grounds for the construction of interview questions and sample design.

A review of the consultant's report Jussi Ylhäisi *and* Stephan P. Kingazi *(*December, 2010) found a number of short-comings in the survey design and the implementation of the protocols. In discussions with NAFORMA's staff, many of the implementation concerns are being addressed through better training of the interviewers beginning this past spring. We concur that many of these issues can be resolved or minimized by better training. There are however other concerns that cannot be addressed through training. These are listed below with recommendations:

1) Identify households to be interviewed as either the closest four or following the recommendation of key informants holds potential bias especially if key informants are used as the basis for selecting households. Theoretically, households should be chosen at random with known probability of inclusion from a list of households within the 2 kilometre circle,
2) The protocols request an estimate of the number of households with the circle from the key informants. While this method does provide an estimate of variance of the key informants ability to estimate households, there are no reference data to which to calibrate their estimates,
3) Non-response. Much of the non-response should be addressed by better training. True non-response should be noted in the analytical report. There are procedures to reduce non-response but they usually require repeated attempts to reach the households as well as using statistical modeling or imputation techniques to 'fill' in the values but filling in the values must be accompanied by a set of assumptions on the nature of the non-response,
4) Down-stream. While it is clear that distant communities can have a significant impact on the local resource consumptions, there are questions that attempt to identify these external sources. Again, the key is for the interviewers to have

an excellent grasp of the questions in order to convey this information to the interviewer. The inclusion of questions that attempt identify the presence of external parties could be used to isolate those plots with down-streaming effect. It should be kept in mind that without quantifying separately the impacts of inhabitants within the 2-kilometre radius circle from those outside of the circle would compromise any analysis trying to relate local governance to the biophysical measurements,

5) NAFORMA recognizes that national governance issues are not addressed with this survey and this should be kept in mind with any interpretation of the results, and
6) Quantifying the downstream effects may best be accomplished by surveying major charcoal distributors and sawmill operators. This statement should not be interpreted as a recommendation that NAFORMA collect this information but rather a statement of a design deficiency for tracking carbon flow.

These concerns should be addressed either during the post-NAFORMA stage or concurrently if the approach is to be used in other countries.

To address concerns one and two, it is recommended that some type of high resolution imagery over all plots be used to count the dwellings and be the bases for household selection. It is recognised that this is a substantial additional costs but there are opportunities to partner with other projects, as is already occurring in Tanzania, to spread the costs. This high-resolution imagery could also be used as reference data for the Landsat TM images if the costs are too high for complete coverage of the high-resolution imagery. Concern three is best addressed by better training. The remaining non-response should be carefully evaluated for the primary reason(s) for the non-response. The solution may be to adjust the field protocols to allow for limited repeated visits, no repeat visits but use a statistical imputation technique if the reason for the non-response is determined to be purely random, or a combination of repeat visits and statistical modelling. It is doubtful if a pure quantification of the biophysical effects can be measured due to local versus down-stream influences. A more feasible approach is to assume that the interviewees are aware of the general magnitude of the down-stream effects to their local resources. To help distinguish the impacts between the internal and external factors, is to have the survey include a question to compare the effects of the external players as being ‘less than’, ‘about the same as’ or ‘more than’ the effects of the local inhabitants. The last concern may need to be taken up by the NCCSC whether and if a more complete accounting of carbon flow is necessary and how best to collect this data.

Mapping:

The mapping section is fully functional, has necessary satellite imagery on location and has completed most of the pre-processing steps that are necessary before map classification can begin for their first product. The first product was the field maps of NAFORMA (2010 – 2011) used by field crews to access the clusters followed by the Land Use / Land Cover (LULC) map (2010) using reference conditions obtained from various sources including field visits by the staff. Unfortunately, this product will not be able to use NAFORMA field plots due to the time constraints. Later products will use

NAFORMA data as reference conditions to produce carbon maps for the country. To support the REDD initiative, a national consultant from the University of Dar es Salaam (UDSM) paid for by UN-REDD will assist NAFORMA in providing historical land cover and land use maps for years 1980, 1990 and 2000. It is unclear of the exact procedures to be used but the unit is working closely with FAO Rome and other sources of remote sense expertise.

NAFORMA has partnered with UN-REDD in a collaborative partnership and function in one common FBD mapping unit. An additional remote sensing expert funded by UN-REDD will be added to support the work and build the capacity of the common FBD-mapping unit and will concentrate on area cover change.

The TWG has recently become fully functional after having some personnel difficulties in the past. They have a very good working relationship with FAO Rome and there are high expectations for future products. Their equipment is adequate for the task although the work stations and server require periodic maintenance. Their work depends on the field data being clean and available and there are some questions whether the TWG can accomplish all their tasks before the end of the project. If data entry is accomplished by zones, there should be adequate time to produce a limited number of products.

3.4 Project relevance

The Second NSGRP, covering the financial years from 2010/11 to 2014/15, is a vehicle for realizing Tanzania's Development Vision 2025 (TDV 2025) and the MDGs. One of Tanzania's growth drivers identified in this national strategy is sustainable exploitation of national resource endowments to generate revenue and employment. The NSGRP identifies constraints, such as poor infrastructure and weak innovation capacity, in achieving sustainable harvesting of forest resources. One of the operational targets in the strategy includes the growth of forestry and forest produce sub-sector from 3.5 % in 2009 to 5.8 % by 2015. Financing strategy options for NSGRP include carbon trade and other potential international climate finance facilities. It also recognises a need for strengthening coordination of the climate change related projects. The NSGRP states that strengthening environmental management, supporting research and technologies for climate change mitigation and adaptation are required. The Tanzanian national decision-making would require creditable and updated information on state of the forests. The opinion of the ET is that the NAFORMA project is well justified and consistent with NSGRP.

The Paris Declaration on Aid Effectiveness requires that the development assistance is aligned with partners' national development strategies. According to the UN Development Assistance Plan for Tanzania (UNDAP) 2011-15 the UN support will be channelled to the three clusters of NSGRP II. In Cluster I (Growth for Reduction of Income Poverty), UNDAP has two Programme Working Groups: Economic Growth, and Environment and Climate Change. The latter group has a key action, responsible by FAO, which includes capacity building for assessing and monitoring forest resources.

The ET reviewed key Tanzanian national legislation and policies, including the Environmental Management Act 2004 and the National Forest Policy 1998. The Forest

Policy has recently been revised to capture new issues, such as the role of forests in global climate change. The final review of the revised Forest Policy was completed in April 2011 and it awaits government approval. The ET sees that NAFORMA is within the framework of national legislation. The justification is clearly articulated at the NFP and NBKP 2001-2010 which will both be revised soon after the approval of new Forest Policy. The ET would like to highlight that the review processes of NFP and NBKP 2011-2020 should make use of new information on Tanzanian forests provided by the NAFORMA project.

Tanzania has obligations for reporting to international organisations and processes such as FAO FRA, the Convention of Biological Diversity (CBD), and the UNFCCC. The NAFORMA project is in a good position to fulfil these requirements. The draft National REDD+ Strategy 2010 identifies ten main strategic interventions and/or key result areas for the REDD+ implementation process in Tanzania. The NAFORMA biophysical survey based on follow-up of Permanent Sample Plots will be the backbone of the National REDD+ Strategy's MRV. Without the NAFORMA information it would be impossible to set-up up a crediting baseline, for example.

The Cancun Agreements (COP 16 of UNFCCC) on REDD+ requests developing countries to develop a robust and transparent national forest monitoring system. The agreement lists seven safeguards in accordance with REDD+ activities are to be undertaken. A system for providing information on how the safeguards are being addressed and respected should also be developed. One of the safeguards concerns transparent and effective national forest governance structures. NAFORMA is piloting monitoring related to safeguards within the REDD+ framework at the local level but there is a need to have such a monitoring also at district and national levels. There are two new initiatives/guides for providing information on REDD+ and forest governance:

a) UN-REDD and Chatham House: a draft Guidance for the Provision of Information on REDD+ Governance, and

b) World Bank and FAO: a Framework for Assessing and Monitoring Forest Governance.

The ET strongly advocates that Tanzania should take advantage of the above-mentioned forest governance initiatives by engaging in upcoming piloting processes.

Multi-source NAFORMA for Tanzania provides an efficient tool to provide estimates not only at the national but also approaching the district level. Priority areas can be targeted with specific forest management regimes such as Participatory Forest Management (PFM). Statistically sound ground measurements are needed to integrate REDD+ MRV and PFM arrangements. However, there will still be a need for additional data collection to fulfil the needs for the SFM and the REDD+ framework. The ET was informed that a needs assessment about what should be produced has started at the Rufiji District. Accordingly the ET was notified that FAO-FIN technical team in Rome will soon test the use the field data for land cover mapping. There is a great need to prioritise issues related to the use of data at districts and smaller units. The ET is confident that additional data collection by NGOs will play an important role in piloting PFM and REDD+ initiatives.

The district and community-level data collection falls under District Councils – which are not under FBD. The experiences from the current data collection, data entry and data use of NAFOBEDA indicate challenges in the future utilisation of NAFORMA data. NAFOBEDA has largely remained inactive. This is due to the weak capacity at the district level, including insufficient financial resources for data collection and data entry, poor technical information and communication technology (ICT) know-how and expertise, as well as weak ability and motivation to make use of available data. The ET recommends that an external study should be carried out to get more detailed information about NAFOBEDA functions and how NAFORMA data can best be incorporated.

4 Project implementation

4.1 Project Budget and Expenditure

According to the budgets of the project documents, the total budget of the NAFORMA project is USD 6.7 million of which USD 5.9 million is a bilateral contribution of the GoF and USD 0.8 million a counterpart contribution of the GoT (Tables 2). GoT also contributes staff, office accommodation, computers, 8 vehicles and some inventory and mapping equipment. The contribution of the GoF was doubled with an amendment to the original agreement in December 2010 by EUR 2 million (equivalent to USD 2,896,642) in addition to the original EUR 1,929,593 (USD 3,017,157). DSA of the field crews is paid from the GoF contribution.

NAFORMA project is also supported through a multilateral FAO-FIN programme on the SFM in a Changing Climate Programme; the agreement between the GoF and FAO was signed on the 20th of March 2009. The FAO-FIN programme involves 5 pilot countries with a total budget of EUR 14 million. A total of 45% of the budget is allocated for general methodological development and technical backstopping. It is difficult to separate the amounts expended for general methodological development and the amounts expended for the technical assistance and operational backstopping services. In some other NFMA projects the expenses of the FAO technical assistance has been 10-30% of the budget (FAO 2008b). The expenses of the FAO-FIN technical assistance and operational backstopping services for the Tanzania NAFORMA project will be, according to the estimates of the Programme Coordinator, in a range of USD 300,000-500,000 million. In addition, the FAO-FIN programme has allocated USD 60,000 to specific NAFORMA project activities (outcome 1) and USD 19,800 for institutionalization of NAFORMA (a component within outcome 2).

Associate Professional Officer (APO) working at the NAFORMA project has a 2-year contract. GoF covers his expenses – a total of USD 165,747 for the first year and USD 154,452 for the second year. The APO Programme allows extending the contract by a year in which case the additional expenses are shared equally between GoF and FAO.

At the current (May 2011) exchange rate the total bilateral contribution of GoF is estimated to be USD 5,481,728. The expenditure of project funds at 29 April 2011 was USD 3,112,125 (Table 3). Thus the remaining funds for the rest of the project period,

until 31 December 2012, are USD 2,369,603. The actual available funds for project activities are less than this amount since 13% of the budget will be Project Support Costs (PSC) and retained by FAO.

Table 2:Source of funding for NAFORMA activities

SOURCE OF FUNDING	**USD**
Government of Finland	
1. Bilateral funding to support NAFORMA project activities in Tanzania	
original funding	3,017,157
additional funding	2,896,642
Total - November 2010 exchange rate	5,913,799
Total - May 2011 exchange rate	5,481,728
2. Multilateral funding for technical backstopping and quality assurance through FAO-FIN Programme	
HQ, technical support (estimate)	500,000 -300,000
Tanzania component 1	60,000
Tanzania component 2	19,800
3. Funding through Associate Professional Officer Programme to support activities in Tanzania	320,199
Government of Tanzania	
Total	794,200
TOTAL (approximately) **Finland bilateral (nro 1) & GoT)**	**6,700,000**
GRAND TOTAL (approximately)	**7,600,000**

The cost of fieldwork has been approximately USD 800 per cluster consisting of DSA for the field crews and drivers (89%), DSA for armed guards (6%) and allowances for panga men and porters (3%), and other costs (2%) – in addition to the GoT paid staff salaries and cost of transport. A total of 910 Field Sample Clusters were measured by May 2011. If the original sampling design will be followed there would be still 2441 clusters to be measured.

The Project Management has estimated that there is a financial gap of approximately USD 1 million assuming that 3.5 clusters/field team will be measured within a week – the average progress so far. The fieldwork has been completed in Eastern Zone where the biomass density is high and sample plots difficult to access. It is most likely that the rest of the NAFORMA clusters will be much faster to measure, due to the lower biomass density and easier terrain. This would reduce the financial gap to a certain amount. However, the results from other countries indicate that the time used for the field data collection from measurements and interviews is not that high – on average 56% of the fieldwork time was spent on collecting data through measurements and interviews, while 18% was spent for planning and 26% for transfer to and from the sample plots to the base (FAO 2008b).

Table 3: NAFORMA budget and actual expenditures until 29.4.2011

	Actual expenditure			Budgeted		
	2009	**2010**	**1.1.-29.4**	**2011*** **1.1.-31.12.**	**2012***	**Total***
Salaries Professional	112,472	188,274	70,355	223,814	49,236	**573,796**
Salaries General Service	0	0		24,000	25,600	**49,600**
Consultants	32,380	102,848	33,093	161,000	79,197	**375,425**
Contracts	0	4,305	7,499	200,000	0	**204,305**
Locally Contracted Labour	3,437	5,643	2,205	2,500	17,000	**28,580**
Travel	3,306	421,929	313,605	1,329,201	108,325	**1,862,761**
Training	28,730	154,974	17,058	46,000	43,000	**272,704**
Expendable Procurement	0	151,592	15,682	17,500	59,543	**228,635**
Non Expendable Procurement	4,565	696,528	-1,471	20,000	36,323	**757,416**
Support Costs (PSC rate 13%)	25,868	267,217	64,948	269,115	68,442	**630,641**
Technical Support Services	0	0		0	98,250	**98,250**
General Operating Expenses	14,094	329,216	41,570	46,102	10,000	**399,412**
General Overhead Expenses	0	203		0	0	**203**
Total	**224,852**	**2,322,729**	564,544	**2,339,232**	**594,916**	**5,481,728**

Total expenditure until 29.4.2011	3,112,125
Total budgeted - expenditures = net available amount to spend	2,369,603

*Official UN 13 May 2011 exchange rate has been adopted to calculate additional EUR 2,000,000 contributions USD equivalent

In order to reduce the expenditure of field measurement the Project Management has reviewed the field parameters to improve efficiency and speed in the field. The recommendations are as follows:

- The following parameters will be measured only in permanent clusters:
    - Dead wood. In addition dead wood will now be measured in the 10 m radius plot instead of the entire 15 m radius. Also the minimum diameter of stems to be measured as dead wood is now 10 cm instead of 5 cm and minimum length is 1.3 m instead of 0.5 m,
    - Canopy cover,

- Forest damage,
- Stump measurement. Also the minimum stump diameter is now 10 cm instead of 5 cm, and
- Tree < 5 cm dbh. The radius of the inner plot will now be 1 m instead of 2 m.

Soil colour will not be assessed in the field since it is assessed in the laboratory.

ET has an opinion that the above-mentioned changes do not jeopardise the project outcomes. The proposed changes fasten the fieldwork and allow reducing the size of the field crews – thus reducing the cost of fieldwork. However, the financial gap will still - most likely - be approximately USD 0.5 million. Some measurements might be taken only in subsets, which are considered adequate to give estimates with reasonable confidence limits at national and sub-national levels. The ET would like to emphasise that in that case the usability of the field survey for SFM at district level will be lower. The reduced sampling intensity will have negative impact on potential REDD+ incentives by lowering the price received from carbon market (baseline estimates have higher uncertainty). The ET does not recommend a reduced sampling intensity as a first choice but to seek additional funds from the GoT and partners.

Table 4: Plan for the Performance Based Pay, May 2010

Teams	**USD**	**%**
Inventory field teams	71,645.00	62.5
Management	10,300.50	9.0
Database Management	17,854.50	15.6
Mapping	12,300.00	10.7
Quality Assurance	2,500.00	2.2
Sub-total, unpaid	**114,600.00**	**100.0**
Sub-total, paid	5,400.00	
Total	**120,000.00**	

The efficiency of the use of the project funds seems to have been satisfactory and the priority of the various needs correct. Financial accounting of the project funds has been sound. Performance Based Payment (PBP) system was approved by the SC and the first payments were made. The PBP is at the moment on hold to be formalised through the Letter of Agreement between FAO HQ and FBD. The ET feels that the PBP is an innovative approach, which should be formally adopted as soon as possible. PBP plan is presented in Table 4.

4.2 Government support

According to the Trust Fund Agreement between the GoT and the FAO, the contribution of the GoT is USD 794,200.00 to cover the cost of in-country seminars, workshops and meetings, the salaries of the national personnel involved in project activities and general operating expenses. In addition the Government is supposed to provide office space, furniture, facilities, electricity and communication. Office space and furniture have been provided and utilities are being paid for. NAFORMA management is housed in a building that previously accommodated the Tanzania Forest Conservation and Management Project (TFCMP). TWG Mapping has joined forces with UN-REDD mapping unit to formulate a new FBD mapping unit which is now located in a renovated building next to NAFORMA management offices. The building also accommodates the

TWG Database. UN-REDD has refurbished the building and has procured a generator for the building.

Table 5 shows the total expenditure (excluding salaries) as of April 2011. A total of TZS 303,800,000.00 (about USD 200,000) has so far been spent. Interviews with NAFORMA and FBD staff overwhelmingly indicated that there is high Government commitment on the project, and funds have always been disbursed timely when required by the project. This is commendable as in many other countries implementing National Forest Assessment (NFA) delays in Government disbursements is common.

Table 5: Government of Tanzania Support as of April 2011

S/N	Activity	Amount
1.	Seminars	12,000,000
2.	Workshops	18,000,000
3.	Meetings	8,400,000
4.	Study Tours	14,400,000
5.	International seminars	12,000,000
6.	Services and repairs	71,000,000
7.	Fuel and lubricants	136,000,000
8.	Office maintenance	20,000,000
9.	Monitoring and evaluation	12,000,000
	Total	303,800,000

The Government has made available all human resources required by the project. At the time of evaluation, the number of staff involved NAFORMA activities was 142 (Table 6). All required qualifications were obtained. In addition, HIV/AIDS awareness workshop involving all NAFORMA staff was held before commencement of field activities.

Table 6: Government of Tanzania human resources for NAFORMA

Category	Male	Female	Total
Management staff	16	7	23
Field Staff	112	7	119
Total	128	14	142

A project launch workshop held on 12th May 2009 and a stakeholder workshop held from 30th June to 1st July 2009, were intended to introduce the project to stakeholders to ensure that their needs are taken on board. This is the best way to ensure uptake of Project's outcomes. Stakeholder needs were taken in subsequent revisions of NAFORMA design. National policy requirements to be addressed by NAFORMA were also discussed in the stakeholder workshop. The ET was informed that NFP revision

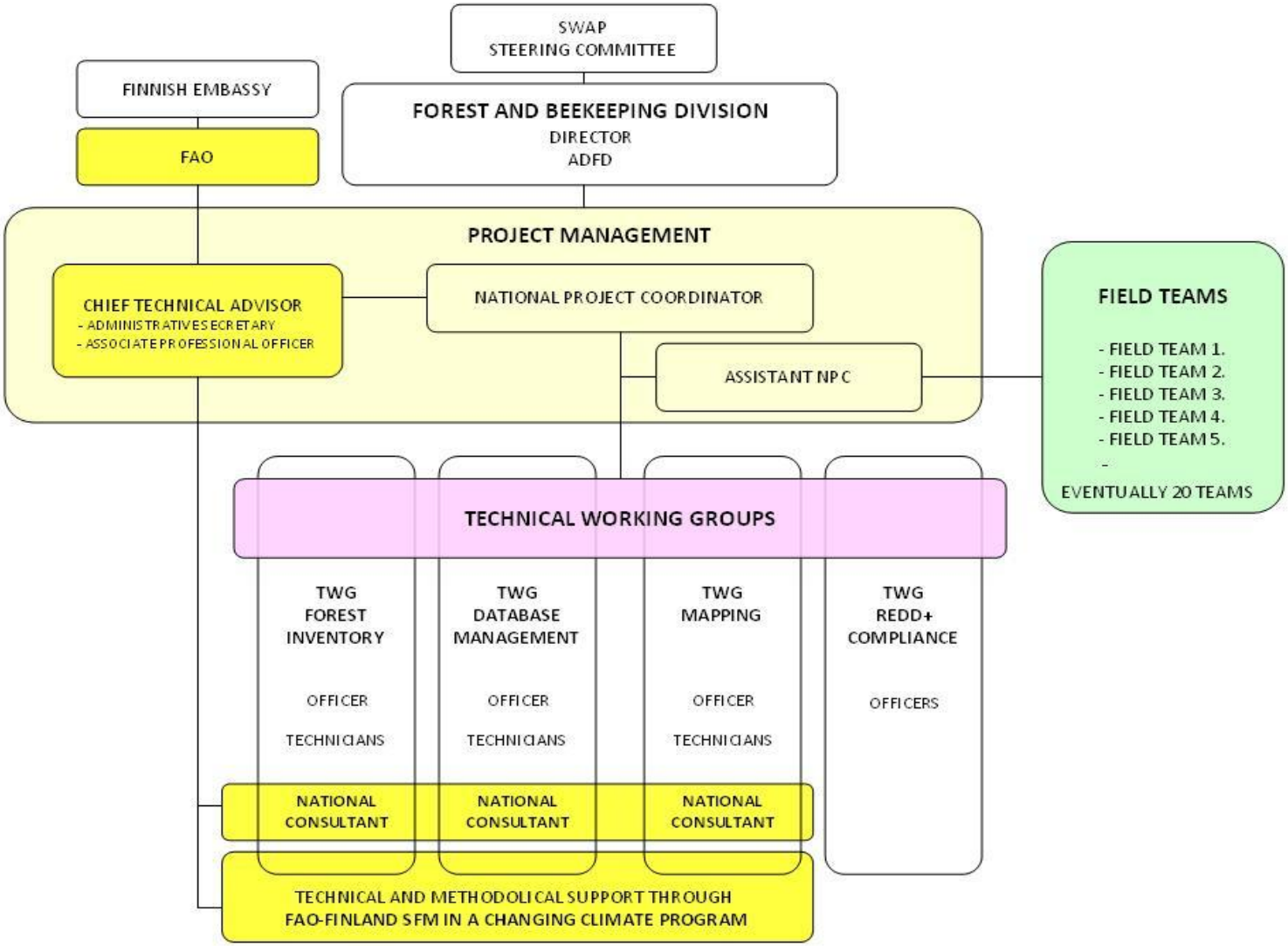
awaits NAFORMA outputs while interviewed stakeholders await to use relevant NAFORMA outputs.

Efforts on many fronts have been completed by the Government and NAFORMA to create local awareness about the project. This will to a large extent widen the stakeholder base for the uptake of outputs. Awareness raising activities included posters, a television programme, radio programmes, press release at the start of field work and participation in trade fairs and shows. With regard to communication concerning the teams work in the villages, letters of introduction were sent to Regional Administrative Secretaries to inform districts. Also letters introducing NAFORMA were sent to District Executive/Municipal Directors, as well as Military bases and Prisons Departments. When the teams arrive in the districts, they request for letters of introduction to village governments. The village governments arrange for one or two villagers to work as pangamen or local tree identifiers and also inform villagers about the presence of the teams in the area. Further awareness could be raised through use of local radios or newspapers.

4.3 Project Management

Figure 1 shows the project organigram. The roles of the staff have been discussed in section 3.3. The PTU which is composed of NPC (Chair), ANPC, CTA, NC, TWG Heads and Administrative Secretary (Recorder) meets regularly to consider planned activities, assess achievements against planned outputs and actions to take in case of constraints. The Project Document indicates that all supporting staff should be members of PTU. However a decision was later reached to have the indicated composition. About ten meetings have so far been held and minutes were made available to the ET.

Figure 1: NAFORMA Organisational Chart*



* Yellow=FAO Support, : Tan=NAFORMA Management: Green=NAFORMA field component

Interviews with stakeholders consulted during the MTE show that the project is generally well managed. The ET shares this view. Overall there was effective and efficient management of operations. Also the decision by FBD to have NAFORMA organisational set up institutionalised within the existing FBD structure is commended as it is one of the several requirements to ensure sustainability. However there have been some delays in project implementation and other issues that have hampered the project from achieving an even higher level of success. These include:

1) **Delays in the appointment of NPC.** A temporary NPC appointed in May 2009 retired two months later. A new NPC was appointed by the Director of Forestry only in early September 2009. The ET did not receive any explanation for the oversight in the first appointment and the delays in replacement.
2) **Budget related complications** which resulted in delay in vehicle and other equipment procurement. The TFCMP which was to support the Government contribution ended in December 2009 before commencement of field work. This contribution was to cover field operating costs as per Project Document. A budget revision in July 2009 to have FBD purchase the vehicles could not work because it was too late. The decision was therefore reached in mid November 2009 to return the purchase of vehicles to FAO.
3) **Slow vehicle procurement by FAO**. Procurement process was initiated in early December 2009 and was not finalized until May 2010 (6 months). Vehicles were received in mid October 2010. Other procurements e.g. radios, inventory equipment and GPS were also slow causing postponement of training activities and consequently field work. The ET was informed that this was mainly due to the FAO bureaucratic processes in procurement.
4) **Delays in disbursement of Daily Subsistence Allowance (DSA)** of field crews due to financial regulations of FAO Country Office. Most delays occurred while crews were in the field and temporary arrangements were made while waiting for funds from FAO, so that field work is not interrupted.
5) **Multiple roles of Govt Staff:** The NPC and the ANPC are the only two FBD employees who have 100% of their working time allocated to the project. All the other government employees have schedules as other FBD staff not attached to NAFORMA. While it is recognised that all of the government workers assigned to NAFORMA are FBD employees, the assigning of duties outside of NAFORMA has had a significant negative impact on training and production within the TWGs, especially those of Mapping and Data entry. There have been instances when training was scheduled including visits with FAO Rome developers, but the employees were unexpectedly absent due to other assignments given by or opportunities offered through the FBD. These unexpected and unscheduled absences have delayed training and have placed some TWGs further behind schedule.
6) **Revision of NAFORMA methodology** to take on board stakeholder views which includes collecting both biophysical and socio economic data, and collecting more detailed, REDD+ compliant data useful also at district level.
7) The **REDD TWG has not been fully integrated** within the management of the project. The REDD team members have several demanding levels of

responsibilities and consequently have not been able to participate in NAFORMA PTU meetings. The main point of input to NAFORMA is through the PTU thus there is little evidence that interaction with the REDD TWG has occurred. The primary source of input in REDD matters has been the national consultant for UN-REDD. While the interaction between UN-REDD and NAFORMA has been very good, the long-term reliance on the consultant does not promote FBD REDD integration. Full integration of REDD TWG is therefore necessary for sustainability.

8) **Field work delays due to prolonged long rains** (March – May 2010). Starting of field work was postponed up to end of May 2010 due to difficult access arising from rains.

9) **Problems of acquiring appropriate satellite imagery**. Technical and budgetary constraints limited acquiring HR satellite and Spot imagery respectively and settled for Landsat 5 and 7 images.

10) **Slow progress of NAFORMA mapping in 2010** due to insufficient technical communication between NC Mapping and FAO Headquarters Consultants. A new NC has been appointed in January 2011 and progress is now satisfactory.

11) **Slow progress of data entry** due to staff having other FBD responsibilities. As of April 2011, the data entry/data management TWG has a backlog of app 450 field forms (app. half the field forms collected) and the unit could have up to 2,500 additional clusters to enter if the full set of clusters is collected. As of the week of May 9th, the unit had increased its capacity for data entry with the addition of 5 new employees through FAO and recruitment of additional 2 more data entry staff during 2011 is planned.

12) **Data storage and backup:** As of May 22, 2011, the data has been stored on individual computers with no regular back-up off site. This poses a grave risk to the approximately USD 400,000 invested in the data already entered. The project has recently acquired a server but it is not as of yet functional. It is critically important that a back-up plan be written including the storage of the back-up medium off-site to safeguard the data in case of a building failure such as a fire.

13) **Database development:** Errors in the data entry and editing programme has delayed the use of the data. Tanzania is a pilot country for a tropical forest inventory that includes a socio-economic survey, a significant departure from the traditional sample design and includes measures for MRV to the international community. These new features were the result of stakeholders meetings during the course of the project and created a significant programming workload. The database developers need to have the business requirements identified including a stable sample design, attribute identified and permissible values or ranges defined and have agreement on the functions of the database. With a significant change to the scope of the project came additional attributes and changes to the database design. The developers had to significantly redesign the data entry screens and in the process, lost some of the functions that the previous versions incorporated. Essentially, the developers are being asked to redesign the

database without loss of time to the database entry TWG, something that is not possible without consequences.

Some of the problems could have been avoided if there were frequent NAFORMA specific SC meetings. On the other hand, the delays though unintended provided more time for the planning and development of the NAFORMA methodology as well as training.

The ToR for professional FAO staff and National Staff of the FBD were reviewed by the ET and also discussed with the concerned staff. The ET is of the opinion that the ToRs are appropriate to meet project needs. On the other hand, a review of the division of labour showed that while each staff implemented relevant ToR, they supported each as much as possible where such a need arose.

A review of communication flow within NAFORMA showed that this aspect was not very smooth. Communication down the hierarchy looked smooth, while it was poor up the hierarchy as well as horizontally. There are cases where staff would be involved in other FBD duties etc, without knowledge of some colleagues. Improved communication would ensure that necessary adjustments are done so that progress of some NAFORMA activities is not jeopardized.

Organisational capacity building within NAFORMA is nearly complete with all of the major components in place. Institutional capacity building needs improvement as the discussion on the SC points out. Individual capacity building has taken place to a degree due to a good working relationship between the Technical Advisors, National Consultants and their FBD counterparts. With 18 months left for the project, there should be a targeted effort to enhance individual capacity building by constructing a strategy that results in the Advisors and Consultants playing a minimal role in the management of the project by December, 2012.

4.4 Technical and Operational Backstopping

The NAFORMA project has established close working relationships with the Embassy of Finland in Dar es Salaam. The Embassy has not only actively monitored the performance of the project but also provided vital support throughout the project implementation. This has included the revision of the budget and prolonged implementation of the project. The actual project backstopping services have been provided from the FAO-Representation in Tanzania in Dar es Salaam and from the FAO-FIN at FAO Headquarters in Rome.

FAO – Tanzania has administered the NAFORMA project funds and being in-charge of procurements and financial management in compliance with the FAO procedures. The ET was informed that the procurement has been slow at times and disbursement of funds been an issue.

FAO FIN in Rome has provided technical backstopping and quality assurance including 12 backstopping visits and approximately 12 consultancy missions (Annex VI: List of consultancies and Backstopping Missions). According to NAFORMA organisation chart FAO FIN is supporting TWGs of Forest Inventory, Database Management and Mapping but not TWG REDD+ Compliance. However, NAFORMA project is supporting REDD+

Compliance functions by producing essential data which will be the backbone of the National REDD+ Strategy's MRV. One may argue that there have not been any specific reasons to support TWG REDD+ Compliance from the NAFORMA funds, since the functions are substantially supported by the UN-REDD Tanzania Programme. The challenges of integrating personnel and embracing objectives supported by 'another' project will become more common as the international community further stresses synergy across the development assistance. The ET believes that only a strong role from the SC within the framework of a SWAp can encourage true cooperation and synergies for the benefit of the whole sector.

Development of the NAFORMA database has been solely undertaken by FAO FIN in Rome, which raises questions on post-project sustainability. During the MTE mission it was noticed that database development would still need significant programming inputs. Some basic functions in the NAFORMA database are not working which has delayed data entry. Individual computers are not linked to server and there is no proper system to back-up for data. The ET was informed that preliminary analysis of the data collected in the Eastern Zone has started but the data from the initial 450 NAFORMA clusters is substandard, and still needs further efforts to ensure higher quality assurance. In conclusion, the ET finds that FAO FIN has provided excellent technical backstopping services and understands the difficulty of creating a database concurrently with data entry but problems with the data entry programme has delayed the use of the data.

The Tanzanian NAFORMA (NFMA) has become the pioneer of the FAO-FIN Programme in the development and updating the multi-purpose NFMA/MRV methodology. The major improvements include improved sampling design, database systems development, soil sampling, socio-economic household surveys including monitoring governance methodology and quality assurance system and tools. The design of the inventory was supported by Metla and in all there have been 10 international and 15 national experts that have supported the development of the project methodology. NAFORMA has been presented in various international fora including the Intergovernmental Panel on Climate Change (IPCC), COP16 of UNFCCC, UN-REDD Policy Board, Commonwealth Forestry Conference, FAO's Committee on Forestry, GEO-FCT, NFMA regional and FCPF meetings. NAFORMA has served as a basis in designing and developing NFMA/NFI methodologies in other countries. The ET is in an opinion that Tanzania has a good chance to become a regional hub on forest monitoring and assessment expertise, and thus be able to transfer the valuable experiences and know-how to other countries and regions.

5 Project contribution to the development objective

5.1 Outputs and outcomes/results

The ET reviewed the following project documents. Each type of documents is followed by the number of documents within the group.

- Manuals and Species Lists (5 not counting dual Kiswahili/English),
- Progress Reports (5), and
- Technical Reports (13).

The complete listing of these documents can be found in Annex V: List of project activities/outputs. In addition, the ET reviewed nine Workshop Proceedings which are also found in Annex V.

The project output to date has been primarily capacity building with all of the major components to the project formed, trained and functioning and the acquisition of the necessary buildings, to equipment and supplies in place. The management staff has been in place after experiencing some delays of filling positions with an occasional turn-over of FBD and national consultants. At the point of the Mid-Term Review, many of the intermediate milestones have been reached but the final products understandably have not been produced. Table 7 contains detailed accounting of the specific outputs and activities listed in the Project Framework and their progress to date. Below are additional comments from the ET that are crosscutting and summary in nature.

The TWG joined forces with the UN-REDD Mapping Unit to form a new FBD Mapping Unit. This was done to provide obvious synergies between the two programs. The ET believes that combining these units is in the best interest of GoT. Even though the partnering with UN-REDD is a positive development, the creation of additional national products will strain the unit's ability to complete their assignment by December, 2012. They should however, be able to deliver sufficient quantity and quality of maps to show the usefulness of the unit. A concern is the timing of nation-wide clean NAFORMA data to be used as reference information for the maps.

Pending the availability of clean edited data, analytical results should be available by the end of the project especially if the data entry TWG enters data by zones. This will allow both the mapping and statistical analysis to be conducted zone by zone as the field data is collected and the data entered. However, there is a concern for the long-term capacity of FBD (or TFS) to do analysis other than to produce tables using pre-programmed routines. While these tables will be sufficient for many uses, pre-programmed routines will not be sufficient to analyze data for emerging issues.

Analysis to support REDD+ MRV objectives should be viewed as the best available but the techniques are still evolving with the exception of remotely sensed maps derived from the biophysical survey. The maps should be adequate for REDD+MRV reporting. The socioeconomic survey has significant data quality issues and the survey itself has statistical issues that will preclude the results as being unbiased. Collecting socioeconomic data nation-wide and trying to relate the responses to the biophysical survey is no small feat. The problem is relying on key informants without a means to calibrate their estimates of households and the selecting of the four closest dwellings to the centre, can produce a bias of unknown magnitude.

Table 7: Outputs, Activities and Progress through April, 2011

Output	Activity	Progress
Approach to national forestry resources monitoring and assessment (NAFORMA) introduced and adapted on consensual basis to meet specific needs of Tanzania for integration with national forest policy, planning development processes and the expected REDD+.	*National Seminar to inform stakeholders and development partners about the national forestry resources monitoring and assessment*	Conducted workshop and with stakeholders, development partners and the press and later met with consultancies on identifying information needs
	Review and adaptation of approach to national forest resources monitoring and assessment on consensual basis to meet specific needs of Tanzania for integration with national forest policy and planning development processes. Workshop on NAFORMA methodology.	Reviewed the conventional FAO approach to NFMA with consultants and stakeholders. As a result of the review, the sample design was significantly altered and is now being implemented.
Information needs on forests, trees and forestry ecosystems defined with focus on management uses and users of forestry resources and on their economic, environmental social and cultural functions and REDD+ MRV.	Survey of users (key line ministries, research institutions and other relevant stakeholders) on information needs about forests and trees for planning and sustainable management of the forestry uses and the country's obligation to report to the international processes, conventions and forums.	The information needs have been identified through workshops and with the aid of consultancy reports.
	Review of the national policy requirements to be addressed by NAFORMA.	Completed with the work of consultants and through the Technical Workshop
	National Workshop for the definition of information needs on forests, trees and forestry ecosystems with focus on management uses and users of forestry resources and on their economic, environmental, social and cultural functions.	Technical workshops held
National experiences and skills in forestry resources monitoring, assessment and information management assessed. Capacity building needs identified and training plans designed.	Assessment of the country's experiences and skills in forestry resources monitoring, assessment and information management. Identification of capacity building needs	Assessment of capacity building needs has been done for each Technical Working Group (TWG) and field teams resulting in the training courses
	Design of training plans and preparation of didactic material in collaboration with teaching institutions.	Field forms and field manuals for the socioeconomic and biophysical surveys were developed and a species lists was compiled and reviewed by specialists. Three training workshops
	Definition of organization, responsibilities and mandates of NAFORMA (Project Technical Unit, field teams)	The Project Technical Unit organization and ToRs, with names of offices and officers was endorsed by FBD senior management. This was later revised to include linkages to

Output	Activity	Progress
NAFORMA organized and operational with core trained personnel and necessary equipment, including institutionalizing specialized unit within FBD.		REDD at the FBD.
	Training of NAFORMA supervision personnel in the Project Technical Unit (PTU)	Technical training of the PTU through on-the-job training and with the support of the National and International consultants. PTU members travelled to Finland, Norway, Mozambique, and Rome to become familiar remote sensing for carbon monitoring, forest inventory work, and database development.
	Training of NAFORMA field teams personnel.	Field teams completed a 1 week training course at SUA in Morogoro in November 2009 on biophysical component and in January 2010 primarily for the socioeconomic component. Later in 2010, the field teams completed a 2 week training also at SUA in Morogoro for the revised biophysical and socio-economic components. In the Fall of 2010, the teams participated in a workshop and training in Bagamoyo. The biophysical survey has QA teams that are working as designed including a feedback loop to the data collectors. While the feedback loop to the data collectors is an excellent component of the QA design, there are still problems with the data quality. It is not clear if the data quality problems are due to insufficient training of the QA teams or the data entry TWG. The socioeconomic surveys are in need of further training on interviewing techniques and the importance of fully completing forms or documenting precisely why the questionnaires could not be completed. Sample design improvements are warranted but not within the time frame of this project.
	Training of NAFORMA mapping personnel	Training was provided by international remote sensing experts, private companies, SUA, and especially by FAO/FIN.
	Training of NAFORMA database personnel	The Head of the TWG completed a one week training class in Rome followed by the supervisor training the training the TWG data entry people. Data quality has been low requiring

Output	Activity	Progress
		additional hands-on training.
	Logistical organization of NAFORMA including procurement and assignment of project equipment, office space allocation, transport etc	Vehicles, inventory equipment and computers + Misc. was initiated in June/July 2009 by FBD following a Budget Revision. However due to the budget and delivery complications, the procurement of vehicles was handed back to FAO where the procurement process was lengthy. See Annex VII for details. In September 2010 TWG Mapping joined forces with UNREDD Mapping Unit to form a new "FBD Mapping Unit". The space allocated to the unit is in a building next to NAFORMA offices.
National forestry information framework – NAFOBEDA and results from NAFORMA – including forest related definitions and classifications harmonized with due consideration of relevant international, regional and national definitions and classifications.	Review of structure and functionality of NAFOBEDA and other forestry related databases.	A cursory review NAFOBEDA done Dec. 2009. The Project Document states that the permanent repository for NAFORMA data is NAFOBEDA. The objective for the FBD is to have NAFOBEDA consolidate and harmonize data collection and reporting procedures for monitoring the status of forests in Tanzania over time. It is unclear how the summarized data will be imported into NAFOBEDA. The ET have seen no documentation that has identified the information that is to be imported or who will develop the routines that takes the data summary information and imports it into the database.
	Harmonization of national forestry information framework – NAFOBEDA and results from NAFORMA – including forest related definitions and classifications with due consideration of relevant national, regional and international definitions and classifications.	Harmonized vegetation classification system was developed during the methodology development work of NAFORMA and is included in the biophysical field manual. This work is not yet completed.
Functional forestry database integrating geo-referenced field data of all variables following the data collection model designed and set up.	Design and setting up of functional forestry database integrating geo-referenced field data of all variables following the data collection concept.	Database software problems remain. The ET believes that the FAO/FIN developer support is very good and responsive to NAFORMA but programming problems remain due insufficient time to develop the software after the requirements were defined. The work to be completed by the developers is still significant. They need to: 1) Incorporate the previous functionality and fix known

Output	Activity	Progress
		problems, 2) Provide for error checking capability to the data that is being entered now. The TWG cannot edit some data cells, and cannot locate entries where the errors occur. There are also 'false positive' errors where the entry has been highlighted as an error but there is nothing wrong with the entry. This last problem complicates the search for true errors, and 3) Provide for a migration path from the previous version of the database to the revised version (if it hasn't already been completed).
Appropriate remote sensing data selected and procured, interpretation carried out and forest/land-use map produced. Multi-source inventory methodology applied for vegetation and biomass mapping.	Acquirement of remote sensing data (2009/10) for mapping Present Land Use Land Cover (LULC) and historic data for forest cover change analysis.	Landsat 5 and Landsat 7 Imageries from 2009/2010 of full country coverage was acquired. During December 2010 collaboration with Bruno Kessler Foundation the Surface Reflectance was computed for the selected Landsat scenes and delivered in December. Landsat Imageries from 1990 and 2000 of full country coverage have also been acquired but have not yet been evaluated for suitability. Under an agreement with Google Earth had high resolution imagery for selected areas from GeoEye and QuickBird. Further exploration is on-going with the help of FAO/FIN.
	Field reconnaissance, interpretation of remote sensing data, field and error checking of interpretation results and finalization of the map.	The TWG has acquired the appropriate software and hardware for producing remotely sensed maps. Pre-processing steps have occurred for the LULC maps and preliminary draft LULC maps have been produced starting early in 2011.
	Production, editing and validation of forest/land use map	Pending
	Integration of in-situ data with LULC. Preparation of thematic maps illustrating NAFORMA results	Pending
National forest and tree inventory planned and carried out and data	Planning of the national forest and tree inventory	The Sampling Design and methodology has been optimized through the Sampling design study Sept 2009/Jan 2010

Output	Activity	Progress
collected from representative nationwide systematic sampling in all types of forests, other wooded lands and other lands.		providing the necessary coordinates for the field plots along with field forms and field manuals.
	Implementation of the field survey and data collection on forests and trees from the representative nationwide systematic sample plots.	Field work started up in May 2010 and the Eastern Zone which covers Morogoro, Tanga, Pwani, and Dar es Salaam regions is complete and part of the Southern Zone – app 900 clusters have been done equaling about 27 % of the total.
Field data encoded in database and processed, results analysed and findings reported and validated	Entry of field data in database, checking, cleaning and validation.	The TWG will need to schedule time for reviewing and editing the data that they are currently entering. The TWG may be able to complete all of the data entry and data edits before the end of the project but this data is needed both for mapping and data analysis. The ET is concerned that the data will not be available for these uses, especially the mapping unit, with sufficient time to complete their tasks. One method to minimize this problem is to have the data entry people focus on one zone at a time. This idea was being discussed in NAFORMA and the ET encourages this approach. Both the mapping and the data analysis can proceed and refine their techniques prior to the availability of all the data.
	Processing of field data, analysis of results, reporting.	No data has been analyzed. FAO/FIN is planning on assisting with the preliminary data analysis through International Experts.
	Validation Workshop of NAFORMA findings	Pending
Diagnosis prepared on state of the forest and tree resources, forest ecosystems and the environment, and on the way these are managed and used by all parties; follow up actions defined and prioritized	Diagnosis of the state of the forest and tree resources, forest ecosystems and the environment, and on the way these are managed and used by all parties; definition and prioritisation of follow up actions	Pending
	Workshop on the state of forestry resources and definition of follow up actions	Pending
	Dissemination of NAFORMA findings to all users through reports, leaflets, medias and the web.	Pending
Specific/management oriented inventories in priority areas designed and project documents formulated for funding by development partners.	Definition of priority areas for detailed forest inventories including forest management oriented inventories	Pending
	Definition of objectives of detailed forest inventories e.g. timber concession management, community based management, timber exploitation, etc	Pending

Output	Activity	Progress
	Design and formulation of projects of detailed forest inventory for funding by development partners.	Pending
Develop Tools and methods for integration of REDD+ MRV to NFMA methodology	In dialogue with Metla and UNREDD to develop NAFORMA into a possible multi-source NFMA that will form the backbone of future monitoring of forest and TOF resources in Tanzania to feed a REDD+ / CC process.	On-going

5.2 Gender Issues

Gender issues and changes in gender relations are important aspects in project planning and implementation. This is intended among others to facilitate equal access by both women and men to various opportunities. With regard to socioeconomic survey, gender specific questions are few in the questionnaire compared to what was recommended by the socio-economics consultants (Ylhäisi and Kingazi. 2010). The ET was informed that gender specific questions had to be reduced to cut down the interview time. Overall there are adequate socio-economic and governance questions to allow necessary correlations with biophysical data.

During interviews, gender balance was to be ensured by interviewing the head of the household and his/her spouse. The design required that two interviewers one female and one male should work together to enable the team to conduct these interviews separately and at the same time. The ET was informed that this could not be implemented, as only one field crew member was allocated to do the socio-economic interview. This was to allow for one crew member to undertake soil sampling but the ET was informed that good data was obtainable without regard to gender of interviewers (Pers. Comm. CTA).

With regard to staffing, there is a relatively good gender balance in the management staff (See Table 6 in Section 4.2). The poor gender balance in the field crew (Table 6) is inescapable given the relatively few women graduates at technical and professional levels. Interviews with a few women management and field crew members showed that women are very well treated by their male counterparts, and no cases of discrimination have been reported.

The ET believes additional questions addressing the concerns of Ylhäisi and Kingazi should be incorporated at the time of re-measurement which should coincide with other changes in the socioeconomic survey as recommended in this evaluation.

5.3 Environmental Issues

High carbon emissions from deforestation and forest degradation in Tanzania mean that the country has a relatively high REDD+ potential.

Jane Goodall Institute and Tanzania Traditional Energy Development and Environment Organisation (TaTEDO), supported by the Royal Norwegian Embassy (RNE), are using NAFORMA methodology in their village-level surveys. The data collected by these NGOs can be easily entered to the NAFORMA database to complement the district-level estimates, if the MNRT so chooses.

The World Wide Fund for Nature (WWF) Tanzania Country Office (TCO) and FBD have signed a Memorandum of Understanding (MoU) on field measurements and data sharing (a project funded by RNE). NAFORMA plot location data will be shared with a degree of accuracy that allows the WWF project to place its plots to add value to the Tanzanian forest monitoring system, without making the exact position of the NAFORMA plots known outside of FBD. The WWF project aims to complement the work of the National REDD Task Force who are coordinating various REDD readiness

activities in Tanzania, in particular efforts to build capacity in REDD MRV as well as the development of a national REDD strategy. The project will harmonize with other carbon and forest assessment, mapping and modelling initiatives in Tanzania through close collaboration with NAFORMA, UN REDD and other programmes. The project will be national in scale. It will seek to establish a network of carbon monitoring plots across all major forest types. These carbon plots will form a part of Tanzanian network of monitoring systems that can deliver, according to WWF, a well researched carbon baseline for the country and provide a foundation for future subsequent assessment of changes in this. The ET reviewed the MoU which seem to be well balanced between the two parties and the collaboration between FBD and WWF is expected to have good synergies.

Climate Change Impacts, Adaptation and Mitigation (CCIAM) in Tanzania (2009-2014) is a Programme coordinated by SUA, in collaboration with UDSM, Ardhi University (ARU), the Tanzania Meteorological Agency (TMA), and the Norwegian University of Life Sciences (UMB); and financed by RNE. The CCIAM Programme includes a 3-year research programme on development of biomass estimation models for carbon monitoring in selected vegetation types of Tanzania. Reliable methods of estimating the volume of the growing stock are needed for the sustainable management of forest resources. Carbon monitoring needs to consider also below ground biomass. Therefore, FBD has specifically requested CCIAM research programme to include development of biomass equations in her activities.

“Enhancing the MRV of forests in Tanzania through the application of advanced remote sensing techniques” is a Light Detection and Ranging (LiDAR) pilot project of the Group on Earth Observations (GEO) Forest Carbon Tracking (FCT) task, funded by RNE and coordinated by SUA. Airborne laser scanning, or LiDAR, is at the moment the most promising remote sensing technology to estimate above-ground biomass. It can attain a relative error of less than 10% on an area much smaller than one hectare. A high precision on biomass estimations is needed when carbon credits are attributed to very small areas. The SUA-GEO FCT LiDAR-project would rely on NAFORMA biophysical data for calibration and verification of LiDAR data. Airborne LiDAR will be piloted in the Liwale district in SE Tanzania to estimate current biomass and changes in biomass over a two-year period. ET team was informed that there will soon be a MoU between FBD and the UMB regarding the LiDAR flights and the sharing of data, including the coordinates of NAFORMA field plots.

Google Inc., a Delaware Corporation, and the MNRT have signed a MoU on mutual benefit on development and installation of national forest monitoring system, including testing of a mobile forest data collection system. The MoU was signed in 2010 and it is valid for a period of two years. NAFORMA has been provided with 2 free licences for Google Earth Pro. The satellite images available via Google Earth have been used to support the field teams in those areas that don’t have topographic map coverage and where more updated background maps are needed to facilitate the access to the sample plots. At the moment it is not possible to download images from Google but high-resolution images can be printed. Google has donated 10 Android mobile phones to NAFORMA, which were tested for socioeconomic survey during March 2010. Mobile phones were found not feasible for data collection at the moment due to the fact that

NAFORMA database is not compatible with Android. On the other hand NAFORMA database server has not yet been set-up. This does not mean that mobile devices could not be used in the future. The ET has an opinion that there is a need for customised solutions for data collection and reviewing as well as web-based mapping and publishing. FAO-FIN team at HQ has been investigating and developing methods to best utilise Google Earth in mapping (down-loading data, use of Google images for supervised LULC classification). Up today the collaboration with Google, especially due to the access to high-resolution satellite imagery, has been useful for NAFORMA. It is advised to review the FAO-FIN agreement with Google before entering a new agreement.

Zanzibar Woody Biomass Survey (ZWBS) is a project proposal submitted by the Government of Zanzibar (through the Ministry of Agriculture and Natural Resources, MANR, Department Forestry and Non-renewable Resources, DFNR) to RNE. The proposal was prepared with support from the Sustainable Management of Land and Environment (SMOLE II) programme, funded by GoF. The proposed ZSWS and NAFORMA sampling designs are consistent as a result of close collaboration between DFNR and the NAFORMA. It is premature to review full potential between ZWBS and NAFORMA since the Project Document has not been adopted and the ET is not sure on how the administrative modalities will be arranged. The fact that Norway does not have an agreement on development cooperation with Government of Zanzibar, might delay the implementation of the project.

5.4 Sustainability: institutional, social, technical and economic

NAFORMA has been introduced to the FBD organisational structure as a project-based initiative. This is despite the Joint Assistance Strategy for Tanzania (JAST) 2006-2010 which advocates country ownership and does not favour Project Implementation Units (PIUs) parallel to Government systems and structures. Accordingly, development partners are expected to participate in sector dialogue using country organizations and systems. The same approach is included also in the NFP 2001-2010. The opinion of the ET is that NAFORMA project could have been better integrated within the FBD structures if received stronger guidance and supervision, especially on institutional matters.

There has been mapping and inventory units at the FBD already before the NAFORMA project but no national forest inventories have been carried out. NAFORMA project is heavily dependent on international and National Consultants and the CTA to provide substantial technical leadership in the project planning, implementation and reporting. These post-project sustainability issues have not yet been discussed and addressed by the SC.

The Tanzania Forest Service (TFS), a semi-autonomous government Executive Agency under the MNRT has been officially established to take over some of the operational roles and functions of FBD. The Service will be operational from 1st July 2011 According to the TFS Framework Document, the Directors of Resources Management, Planning and Resources Utilisation, and Business Support Services will report to the Chief Executive. The duties of the Directorate of Resources Management (DRM) will include the coordination of forest resource assessments.

TFS Strategic Plan July 2010 – June 2013 looks forward to ensure that all types of forest reserves should have management plans, which are based on reliable inventory data taken at regular intervals. In addition, regular resource assessment should be carried out to monitor any changes in the forest estate due to degradation and deforestation. The Strategy recognises that there are inadequate financial resources to carry out regular forest and bee resource assessments and monitoring. At the moment there is no specific budget for the TFS. However, significant steps have been made towards sustainable forest financing. The Forest Fund, established a year ago, is used as a source of funding for sectoral activities; there is a levy of 2% for fees, and 3% for royalties which has so far contributed a total of TZS 2 billion (USD 1.3 million) to the Fund. The Forest Fund may be used to secure institutionalisation of NAFORMA.

FBD has been allowed to retain 30% of silvicultural and logging fees to service silvicultural and road maintenance activities in the plantations; the ET was informed that the newly established TFS will be allowed to retain 100% of the same. In 2007/08 about TZS 23 billion (USD 15 million) was collected; 2008/2009 TZS 15.5 billion (USD 10 million); and 2009/2010 TZS 31.4 billion (USD 20 million). The potential of increased revenue is very high due to the current “leakages”, including under valuation of royalties and license fees. On the other hand, Treasury is also keen to access a portion of the revenue retained by the TFS (revenue collected by FBD represent 50% of the total revenue collected by the MNRT). The budget of the FBD has been about USD 8 million; of which 50% has been funds provided by the development partners.

The government budget on forestry has been less than 1% of the total national budget in the last three decades. The donor contribution to forestry projects and related activities has been about 70% of the total sector funding. Currently, the FBD receives its financing from three sources: treasury, forest revenues and development partners

According to the TFS Framework Document NAFORMA will be placed within TFS. On the other hand the draft National Strategy for REDD+ states that NCMC may outsource the field data collection, mapping and compilation of carbon accounts to government or private entities. Since the objective of the NAFORMA is wider than just providing data for carbon monitoring, the ET has come to conclusion that TFS is the most feasible option to carry on NAFORMA post-project roles and functions. However the NCMC, when operational, will be the depository of NAFORMA data. Some functions of NAFORMA could be out-sourced, especially those services and functions which require high technical expertise. In conclusion, NAFORMA is on path to integration with TFS but current and expanding responsibilities will be challenging. There is a need to ensure long term monitoring of forest resources as well as carry out specific and management oriented inventories. The ET is of the opinion that post-project sustainability would require further support not only from the GoT but also from other partners.

FAO FIN Forestry Programme has a Component 2, which includes activities to a) develop a strategy for institutionalizing NAFORMA to ensure post-project continuity (as part of the NFP 2011-2020), b) explore demand, approaches and tools to support national policy processes through demand-driven integrated information provision based on NAFOBEDA and other data sources. The ET agrees that the two activities identified by FBD as part of the FAO FIN should be given a high priority.

5.5 Overall effectiveness of intervention

The project was originally scheduled to last 36 months and to install a set of plots across the country, develop a quality assurance plan to increase the quality of the data collected, enter data into a database that did not initially exist, produce a land class/land use map, deliver analytical results and to have the functions of NAFORMA institutionalized. Recently, the project was amended to include a several fold increase of plots in order to make these results meaningful to the sub-national or even District level. In addition, the socioeconomic survey was redesigned to accommodate REDD+ questions as well as an expanded role of the mapping TWG in cooperation with UN-REDD. Eight additional months were added to the original schedule.

Although there had been some inventories of localized areas in the past, the project began without having the benefit of an existing organisational structure. NAFORMA has had data quality issues, personnel recruitment and training challenges, and typical procurement and money delivery delays that plague many projects. In spite of these challenges, the project has been able to focus on overcoming their shortfalls while increasing their production capacity.

In summary, the project has done an admirable job under the circumstances and has the ability to 'self-correct' due to a committed project team and strong support from FAO-Rome. It is our opinion that the project's specific objectives are sound and worthy of pursuing but the time for this project should have been longer, maybe in the vicinity of 60 months. Another review towards the end of the project will be in a much better position to gauge the amount of time and any additional course-corrections necessary for a full integration with the new organisational structures within the government.

5.6 Project current and potential impact

This is a mid-term evaluation and thus project impact should essentially be assessed after end of the project. Project progress so far is commendable, and the following impacts are expected:

1) A national information system for management and updating of knowledge on state and changes of forest and tree resources,
2) Enhanced human resource capacity in NAFORMA. This capacity will enable future planning and implementation of National Forest Assessments,
3) Use of NAFORMA analysed data by FBD/ TFS in policy and project/programme development, as well as by other stakeholders in research, training and project/programme development. This will result in SFM and poverty alleviation, and
4) Improvement of knowledge of forest and tree resources and strengthened reporting capacity to FAO Global FRA and other international processes like Convention CBD and UNFCCC.

6 Conclusions and Recommendations

6.1 Conclusions

After visiting the project, reviewing documentation, assessing the installation protocols with a field crew, talking to staff, and interviewing managers, consultants and stakeholders, the ET has concluded that the project is relevant, conceptually sound, and well executed. Its contribution to the development objectives is in the beginning phase of producing final products. The organizational structure and key staff are in place to take advantage of the consultants and advisors for building the capacity within the GoT for sustained success.

The project has much to offer as an excellent example of multi-source integrated approach to monitoring and assessing of forest resources. The backbone of the project is the field plots that can easily be augmented to capture the entire range of terrestrial carbon including grasses and small down woody material. The fact that this inventory is classified as 'forest resources' belies the fact that it is an excellent platform for an all vegetation inventory that can fulfil the needs for assessing terrestrial carbon.

However, there is a risk that the NAFORMA project is collecting scientifically credible data without necessary impact to policy development and management direction. It is evident that there is a need for an analytical unit to serve strategic decision-making. There is also a need for a data sharing policy and a protocol. In general, it is important to maintain a dialogue between users and producers of information to ensure that data collection will remain demand-driven.

The synergies with other projects that are trying to link reference data (field plots) with remotely sensed data should be encouraged and strengthened. These technologies need measured ground data to calibrate their sensor readings regardless if it is high-resolution imagery or LiDAR and an existing set of permanent plots is exactly what this technology needs.

These glowing remarks from the ET should not however be construed that the project is perfect. It is a reflection of the potential of the project not necessary the existing state. While the status of the project is good, improvements can make it substantially better. The following are specific findings with our recommendations.

6.2 Recommendations

Budget

1. **Budget deficit:** The financial gap is estimated to be at least USD 0.5 million due to the high cost of field data collection. If there are no additional funds available, the number of measured clusters should be reduced. However, the reduced sampling intensity will have negative impact to the usability of output data at Districts and for REDD+. NAFORMA is a model inventory not only for the FAO-FIN pilot countries but also for the Southern Hemisphere in general. Therefore, a special effort is needed to ensure that the initially planned outcomes will be achieved.

   MTE Recommendation for the NAFORMA management: Review whether the field crews size can be reduced as NAFORMA moves into areas that are more

roaded and easier to survey. If needed, seek funds first from GoT and then from other organizations that have a stake in the project's success**.** Follow the performance of field data collection and carefully monitor expenditures to avoid future budget deficits.

MTE Recommendation for FAO FIN: Support GoT to seek additional funds.

2. **Budget for Post-project NAFORMA:** Tanzania's budget preparation process starts October when Budget Guidelines (BG) are prepared. The MTEF entails a 3-year planning perspective. The MTEF process ensures that donor support is integrated into national budget to increase aid predictability. Discussions on annual work plan and budget may take place up to March 15. This is the deadline for submitting proposals for the next financial year.

   MTE Recommendation for MNRT: Submit the projections for the 2012/2013 budget by March 2012 in order to ensure availability of funds to carry out the NAFORMA activities.

Project Management

3. **Steering Committee:** The guidance and supervision of NAFORMA is undertaken by the NFP SC. The Trust Fund Agreement requires that the SC meets every three months or more frequently when needed. The ET was informed that the SC meetings were less frequent than required (one or 2 meetings per year). The ET feels that NAFORMA has not received adequate guidance and supervision from the SC as pointed out by some stakeholders.

   MTE Recommendation for the Chair of SC: There is a pressing need to discuss and make strategic decisions on analytical unit, data sharing and data use as well as institutionalisation and the post-project sustainability. The SC should therefore meet frequently to ensure long-term success and desired impacts to the Tanzanian forestry sector.

4. **SWAp:** It is Government policy that all interventions/projects under the NFP should be included in a SWAp to encourage coordination across projects. The concept of SWAp is also included in the recently published *United Nations Development Assistance Plan* (UNDAP) for the period July 2011-June 2015 by UN Tanzania. There is little evidence that the GoT has implemented a SWAp in forestry even though such a plan would be of significant help to coordinate and avoid duplication of efforts across projects.

5. **MTE Recommendation for the Chair of SC:** The SC should develop a SWAp for forestry. The SWAp should tier to the NFP and focus on coordination and avoidance of duplication across projects as well as identifying program gaps.

6. **Multiple roles of FBD staff:** The ET was informed that multiple roles of FBD staff hinder project performance. This was noted for TWGs Mapping and Database Management who were not available at times for training and for production work.

   MTE Recommendation for the Director of FBD: Ensure that FBD employees involved with NAFORMA (TWGs Mapping and Database Management) are tasked

less to other duties. This will be the only way to ensure that capacity building of the staff takes place, while National Consultants are still in the project.

7. **TWG REDD+:** While no adjustments in the organization are recommended by the ET, discussions with stakeholders showed that the TWG REDD+ members were not active in various activities of NAFORMA e.g. Project Technical Unit (PTU) meetings. The ET was informed that multiple roles of REDD+ staff hinder close interaction.

   MTE Recommendation for SC and the Director of FBD: The roles, responsibilities and commitments of the TWG REDD+ members to NAFORMA must be revisited and if needed clarified by the SC. Obviously TWG REDD+ should have a representation when those issues are discussed. The relationship with the REDD+ Task Force is important now and will become increasingly crucial as the Task Force is replaced by the NCCTC and the NCMC is formed.

8. **Data sharing:** It is most likely that the NAFORMA data will not be analysed to its fullest potential unless the data is made accessible for responsible NGOs and academia. Additional data collection by FBD partners will play an important role in piloting SFM and REDD+ initiatives.

   MTE Recommendation for SC: There is an urgent need for a data sharing policy and protocols. The NAFORMA data should be made accessible, preferable through web interface. Several policies must be created for:

   - Sharing biophysical data without plot coordinates, and
   - Evaluating requests for exact plot coordinates.

   Evaluating requests to analysis of interview data at NAFORMA. Raw interview data must not be allowed to leave a secured room or be loaded on any non-NAFORMA storage device to protect the confidentiality of the individuals.

9. **Performance Based Payments:** PBP is an innovative approach, which has a positive impact to work performance, including the quality of work. PBP was started but soon put on hold. The NAFORMA teams are looking forward for these incentives, the system, which has been approved by the SC.

   MTE Recommendation for FAO (Coordinator of FAO FIN to initiate action): A Letter of Agreement should be signed without any further delay.

10. **Complete documentation:** Overall, the NAFORMA project has documented their procedures well but there are gaps. For example, the sample design is well documented but there isn't documentation on the estimators. The vegetation classification documentation is not complete although some of this may be due to not settling on a specific method.

    MTE Recommendation for FAO FIN and NAFORMA management: Complete the documentation as soon as procedures are developed or adopted. Documentation is easy to overlook but time must be set aside for the very important task.

Forest Assessment and Data Management

11. **Data Quality:** There is a good system of QA for the biophysical field data though there are some data quality problems. For the socioeconomic and the local governance data quality is low. There are missing values, suspect entries and indications that the interviewers may not fully understand the questions being asked. Also gender specific questions are not covered in the questionnaire.

    MTE Recommendation for FAO FIN and NAFORMA management: Training must emphasize understanding of the question and the importance of filling the form completely or documenting why the data is missing. The training must also include testing for comprehension. For biophysical data, the QA and field management teams must emphasize data quality and errors must be rectified before forms are returned to Dar es Salaam. With regard to gender specific questions, questionnaire revision at this time is not feasible, as field work is already advanced as well as the associated costs of the revision in terms of data collection and database changes.

12. **Data back-up System off-site:** As of May 22, 2011, the field data has been stored on individual computers with no regular back-up off site. This poses a grave risk to the approximately USD 400,000 invested in the data already entered. The project has recently acquired a server but it is not yet functional.

    MTE Recommendation for FAO FIN and NAFORMA management: It is critically important that a back-up plan should be implemented including the storage of the back-up medium off-site to safeguard the data in case of a building failure such as a fire.

13. **Database development and other technical support:** NAFORMA project is heavily dependent on international and National Consultants. Database development has been done entirely by FAO-FIN at FAO HQ in Rome, and there is uncertainty how the database development is supported after the NAFORMA project. Data entry at FBD has been delayed due to database development, and even today some basic functions are not working (error checking routines, false positives, system does not identify where errors/warnings occur, etc.).

    MTE Recommendation for FAO FIN (Coordinator to initiate action): Urgent action on database development is needed. The continuity of post-project FAO technical support should be clarified.

14. **Biomass equations:** The forest carbon assessment will employ several methods including field measurements of individual trees, remote sensing for forest cover and change detection, as well as estimates of biomass density in various forest types and agro-ecological zones. There are different precision levels (so-called tiers) in carbon measurements, and moving to higher tiers improves the accuracy of the carbon inventory and reduces uncertainty. CCIAM programme coordinated by SUA includes a 3-year research programme on development of biomass estimation models for carbon monitoring in selected vegetation types.

    MTE Recommendation for FBD/TFS: Collaborate with CCIAM to produce biomass estimation models for carbon monitoring. Before detailed data is available simple equations and IPCC default parameter values can be used.

15. **NAFORMA input to REDD+ MRV:** There is need for careful coordination of NAFORMA activities in relation to other parallel initiatives so that gaps and overlaps

are avoided. Forest area change detection and carbon storage and change mapping within UN-REDD has a planned completion date at the end of 2011. At that time the NAFORMA field data will not be completely available.

MTE Recommendation for FBD/TFS: Become more involved in avoiding parallel mapping initiatives and develop national maps on data collected from NAFORMA. NAFORMA must also develop closer ties with Norwegian funded projects such as WWF to maximize the utility of both projects to support REDD+. The available FAO-FIN technical support and backstopping should be utilised for land cover change mapping.

16. **Assessment of REDD+ and forest governance:** The Cancun Agreements (COP 16) on REDD+ requests developing countries to develop a robust and transparent national forest monitoring system. The Agreements list seven safeguards which in accordance with REDD+ activities are to be undertaken. A system for providing information on how the safeguards (including transparent and effective national forest governance) are being addressed and respected should also be developed.

    MTE Recommendation for GoT and partners (Director of FBD to initiate action): Tanzania should take advantage of the recent UN REDD/Chatham House and FAO/World Bank forest governance framework initiatives by engaging in upcoming piloting processes.

17. **NAFOBEDA:** The analysed NAFORMA data should be linked to the continuously updated NAFOBEDA, which has been developed to become the main vehicle for monitoring the impact of management activities on forests at both national and local government levels. The objective of NAFOBEDA is to create a uniform, transparent system for impact monitoring to facilitate decision making for SFM. The main data entry point is at the District level where the District Forest Officers (DFO) are on the frontline of regulating forest management. DFOs are responsible to the District Council and not to FBD. The fact is that the NAFOBEDA routine procedures have not been followed and the database has largely remained inactive.

    MTE Recommendation for MNRT and partners: An external study should be carried out to get more detailed information about NAFOBEDA functions and a way forward.

Sustainability

18. **Exit Strategy for Consultants:** Individual capacity building has taken place to some degree due to a good working relationship between the Technical Advisors and National Consultants and their FBD counterparts but the project remains heavily dependent on international and National Consultants, and the CTA to provide substantial technical leadership in the project planning, implementation and reporting.

    MTE Recommendation for FBD/TFS: Develop an exit strategy for national consultants to ensure smooth transfer of technical expertise. The project management duties should be increasingly shifted to FBD staff. This is one of the issues which should be urgently discussed and decided by the SC.

19. **Institutionalization of NAFORMA:** FAO-FIN Forestry Programme includes activities to ensure post-project continuity and a demand-driven integrated information provision.

    MTE Recommendation for SC (CTA to initiate action): Consultancy for institutionalizing of NAFORMA should have a high priority within the FAO-FIN Tanzania Component 2. Consultancy should include a proposal for post-project NAFORMA (organisational structure, function carried by TFS/functions outsourced, budget, synergies and collaboration with other institutions and partners). The funds allocated for the consultancy in the FAO-FIN agreement may not be sufficient to carry out the task. The first priority is to produce the budget projection for the 2012/2013.

20. **Post-project host of NAFORMA:** The draft National Strategy for REDD+ states that the NCMC will provide technical services on measuring, reporting and verification of REDD+ activities across the country. It will be a depository of all data and information concerning REDD+. The key function of the NCMC will be to provide a system for an independent verification of carbon at the national level. The other core tasks, according to draft Strategy, include the identification of data needs and outsourcing of field data collection, mapping and compilation of carbon accounts to government or private entities with sufficient human resources and technical expertise to carry out the tasks. The inventory based on Permanent Sample Plots (PSPs) is the backbone of the National REDD+ Strategy's MRV. However, the objective of the NAFORMA is wider than just providing data for carbon monitoring. It is also to assist the GoT to generate the knowledge necessary for taking decisions on national issues in connection with forestry resources management and provide information at the sub-national or even District level to aid the District Councils in local management plans.

    MTE Recommendation for GoT: TFS is the most feasible option to carry on NAFORMA post-project roles and functions. Once the NCMC is operational, there should be a person who is directly responsible for the interaction between NAFORMA and NCMC to ensure that the needs of the NCCSC are met. The FBD/TFS should develop partnership agreements and contracts with academic institutions, NGOs, and private sector to formalise linkages and synergies as well as to execute outsourced tasks.

21. **Post project external support:** NAFORMA project is to define long term monitoring programme of the forestry resources which includes an adequate capacity to re-measure PSPs and carry out specific and management oriented inventories. At the moment the project is heavily dependent on international and National Consultants, and it is more than obvious that there will be a need for further post-project external technical support.

    MTE Recommendation for development partners: Support the post project sustainability through multilateral and/or bilateral collaboration, or through instruments for institutional cooperation, including North-South and South-South twinning.

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Annex I: Biophysical Methodology

A full description of the development of the sample design can be found in Tomppo et al. (2010). Fifty-nine Landsat TM orthorectified images from 1999-2002 were selected based on clarity of the image and overlapped to produce a mosaic. This mosaic of 30 meter pixels was transformed to reflectance over the top of the atmosphere to reduce the effects of different image dates and times. This image was then further corrected for numerous other factors by using MODIS imagery as a reference image. These processes reduced but did not eliminate differences among the Landsat TM images.

Hunting maps for vegetation and road classes 1 to 5 (roads and footpaths) were downloaded from the FAO website and rasterized to 30 meter pixel size to match the Landsat TM data. Rivers were downloaded from the Africover database and were also rasterized. Estimates of growing stock and walking times raster maps were produced by assigning average growing stock and walking times for each of the original Hunting map classes. The raster walking map was intersected with the road and river maps and assigned a walking speed of 10 and 200 minutes/km respectively. This adjusted the walking speed map to take into account the easy walking on roads and footpaths while also accounting for the time delays attributed by rivers. The map classes were re-classified into 7 classes. Clearly non-forested categories were logical groupings into classes 6 and 7. The re-classified vegetation strata were:

1) forest and closed woodland,
2) open woodland,
3) bushland and thicket,
4) mixed/scattered area,
5) grassland and inundate,
6) treeless, and
7) water.

District and political boundaries were also taken from the Africover map data. The re-classified vegetation strata 1 to 3 were labelled as ‘forested’ and 1 through 6 with the exception of the Hunting vegetation codes for grasslands, croplands, herbaceous crops and combination of these codes were labelled as ‘woodlands’. A label of ‘all lands’ contained strata 1 to 6 inclusive of all Hunting vegetation codes.

Due to a lack of tropical field data, a model that related plot volumes from Finnish data to logical explanatory variables based on ratios of spectral bands was developed using non-linear regression. This model was applied to the transformed Landsat TM data from Tanzania to produce a map of predicted volume. Values from pixels under clouds or cloud shadows were randomly drawn from a normal distribution with a mean and standard distribution equal to the empirical mean and standard deviation of the volume predicted from the corresponding Hunting map category.

The time to measure a field plot or a cluster was divided into several phases including walking times while using a Global Positioning System (GPS) unit and the estimated

time to measure a plot based on vegetation type. Other time considerations included an assumption that the driving time to a cluster was 50 minutes, and a 60 minute pause that included lunch and miscellaneous actions not included in the plot measurement. Distance to the cluster was calculated as the shortest route from the closest road to the cluster and the walking time was based on the estimated times assigned the Hunting map.

For each plot, a minimum accumulated travel cost from the nearest road/footpath was calculated. The accumulated travel cost is a function of walking speed by Hunting vegetation classes, an elevation model to compensate for the actual surface distance that must be travelled and the vertical factor. The vertical factor is the travel time due to the different walking speed associated with downhill and uphill movements as compared to the travel time on level ground and it ranges from 1 (level ground or very little slope) to 3.65 for a slope of -50 or +50 degrees. A slope less than -50 or greater than +50 was deemed inaccessible. The walking distance, vertical factor and the Hunting vegetation class were taken into account for the plots within a cluster. The average value of the plots were calculated and expanded to represent the cluster. In addition, a coefficient of 1.1 was used to multiply all the walking distances or walking time estimates to approximate the need to avoid water areas and other obstacles.

The total daily working time is 480 minutes. For the cluster sampling designs the total amount of days needed to measure all the plots in a sample are calculated by dividing the clusters into two groups, 1) those which take either less than 350 minutes or more than 480 minutes, and 2) those which take between 350 and 480 minutes. For the former ones, the total working time in days is obtained dividing the total minutes by 480. The latter clusters are considered to need one day. If the time needed exceeds 480 minutes, a crew will continue measuring the cluster, staying on field, on the next day.

Using the above assumptions, the costs in time (minutes) for each cluster, were calculated for a systematic grid of plots. The simulation programme called a subroutine which returned the time cost for the cluster. The cost estimates can then be used in the allocation of the sample plots in each stratum (see Double sampling for stratification) as well as to estimate the total cost of a particular sample.

Semivariances were calculated from the volume predictions based on Hunting map for the re-classified strata 1 to 4. Based on these graphs a distance of 250 meters between plots in a cluster was chosen.

The basic approach used for allocating the samples can be classified as a double sampling for stratification with clusters being treated as the sample element.

The phases in sampling simulation can be summarised as follows:

- A dense grid of clusters was laid over Tanzania using equal distances of 5 km x 5 km between the clusters,
- Cluster level mean volumes were calculated per land, as well as per classes re-classified hunting 1-6 (’wooded land’) and for re-classified hunting classes 1-3 (’forest land’),
- Cluster level costs (times) were calculated,
- The clusters were classified into classes for the second phase sample,

- In the selected classification, 4 volume classes, 3 cost classes and 3 slope classes were used to produce a possible 36 categories. A number of combinations involving the two steeper slope classes were collapsed to produce a total of 18 strata.
- The volume intervals were determined using optimal classification.
- The sampling intensities in different strata were selected using optimal allocation. The sampling intensities are proportional to the quantity $^{st}/\sqrt{c}$

  Where:

  s is within stratum standard deviation of the mean volume of the growing stock on land on a cluster,

  c is the average costs (measurement) time of a cluster, and

  t an exponent to be determined to control the effect of the *s* on the strata weights (intensities).

- The densities were adjusted to different total cost levels (1, 2.5 and 4 million USD) of which the 2.5 million alternative was eventually selected for NAFORMA, and
- The standard error estimates were calculated for each design for the entire country, for strata and for the example district repeating the procedure 1000 times and taking the between sample standard deviation of the parameter estimates of interest, e.g. mean volume.

Simulation runs were produced using optimal allocation of plots among the strata for fixed costs levels as well as on simulation that did not include stratification as a comparison of statistical efficiencies.

Annex II: Terms of Reference

Mid-Term Evaluation of National Forest Monitoring and Assessment of Tanzania (NAFORMA)
GCP/GLO/194/MUL

1 Background

The National Forest Resources Monitoring and Assessment of Tanzania (NAFORMA - GCP/GLO/194/MUL) is a multistakeholder project aimed at capturing accurate and timely information regarding the state and extent of the forest and trees outside forest (TOF) resources of Tanzania. This is done through mapping the current extent of the forest and TOF resources, by establishing a sample based approach to determine the rate of historic land cover change from 3-4 points in time (2010 – 2000 – 1990 – and possibly1980) and by establishing a system of sample clusters (app 3400 in total) throughout the country of which 25% are permanent. Combined these will provide new updated knowledge on the forest and TOF resources of Tanzania and allow for future monitoring of the development of the resources (deforestation and forest degradation) through repeated measurements.

NAFORMA will introduce a policy-relevant, holistic and integrated approach to multipurpose National Forest Assessment (NFA) that addresses domestic needs for information as well as the international reporting requirements including expected REDD+ MRV requirements. NAFORMA is a multi source inventory whose results are supported by both the field plots on the ground for bio-physical and socio-economic/governance data and RS data (including LiDAR). The platform for dissemination of future updated information on deforestation and forest degradation through repeated measurements to the users will be web based.

The 3 main actors below were actively involved in compiling the Project Document in 2007, signing the Project Agreement in 2008 and revising the Project Document and the Project Agreement late 2010:

1. The Government of Finland (GoF), as the Donor originally committed EUR 1.929.593 to the project over the initial three-year period and committed an additional 2 MEUR in the end of 2010 due to the substantial expansion of NAFORMA´s scope
2. The Government of the United Republic of Tanzania (GoT) as counterpart contribution has committed USD 794.200 for the same three- year period. GoT provides the office facilities and organisational setting for NAFORMA and covers the operational costs.
3. FAO provides the logistical framework and technical support for developing methodologies and tools, and procurements. NAFORMA has a crucial role for the Global FAO-Finland Forestry Programme (FAO-FIN) and FAO in methodological and tools development to meet the increased needs for improved forestry information and monitoring. NAFORMA's outputs are increasingly used in other countries.

The rise of climate change issues on the development agenda has attracted many new donors/actors to the sector of forest inventories, the methodologies of which are developed so

they can be used to monitor forest resources as well as changes in carbon stock. This has necessitated adjustments also in the output and approach of NAFORMA leading to a wealth of possibilities for collaboration and synergies for the project. In the same time, there is also need for careful coordination of NAFORMA activities in relation to other parallel initiatives so that gaps and overlaps are avoided.

Due to the strategic timing of NAFORMA and the fact that the other countries of the FAO-FIN started some time later, NAFORMA has become the leading project for developing new timely methodology for national forest inventories (NFI). There is huge international interest in the development of the NAFORMA methodology, NAFORMA results and also in collaborating with NAFORMA.

NAFORMA sampling design and methodology was finalized by early March 2010 when manuals, field forms and database were produced. In December 2010 they were revised into their final format. In the revised version, a section regarding soil sampling for soil carbon was incorporated in the biophysical manual / field forms while governance parameters for REDD+ were included in the socioeconomic manual and field forms.

By March 2011, NAFORMA is well into the implementing phase and has a fully grown field component and an operational mapping and data entry component. The year 2011 will be used for implementing NAFORMA through field work, Land Use Land Cover (LULC) mapping, Land Cover Change Assessment and data entry while 2012 will be dedicated to analysis, reporting and institutionalizing NAFORMA. NAFORMA as a project is set to end in December 2012 and from 2013 an institutionalized NAFORMA will take over.

2. Purpose of the Evaluation

The Project Document calls for Tri-Partite Reviews (TPR) to provide in-depth project evaluation half way through the project period and again towards the end of the project.

During these evaluations the representatives of FAO, GoF and GoT will jointly examine the progress and achievements of the project and decide on possible follow-up.

According to the Project Document, the organization, terms of reference and exact timing and place of the review will be decided in consultation between the three parties. At least one month in advance the National Project Coordinator in coordination with the CTA will prepare and submit a Project Performance Evaluation Report (PPER) to FAO and the Ministry of Natural Resources and Tourism (MNRT) of the GoT.

As FAO no longer employs tripartite MTRs, the current term review has been renamed Mid Term Evaluation (MTE). The size and importance of the project and the degree of donor commitment necessitates the participation of the 3 parties in the evaluation.

The MTE is scheduled for the first half of May 2011. This is a strategic time for a number of reasons:

- The preparatory phase (Development of methodology and sampling design + training and mobilization of resources) has been completed, allowing for full overview of the data collection and the available resources for the work. The operation modalities of NAFORMA are well established.

- The Project is in full executing Phase:
    - An active fieldwork component (expected 1/5 – 1/4 of the sample clusters will be covered by the field teams)
    - An active Land Use Land Cover Mapping component meaning that approximately 1/3 of the area of Tanzania completed
    - An active data management component allowing for preliminary insight in the collected information
    - An active quality assurance component
    - Additionally, there will be much data collected and partly verified, analysed and tested among stakeholders.

- Mid May 2011, the field teams will be breaking for the rains, meaning that the following key persons who are normally in the field will be available for meetings and to contribute in the work: National Consultant (NC) Inventory and Assistant National Project Coordinator (ANPC) and the Head of Technical Working Group (TWG) Inventory (responsible for Quality Assurance).

- The collaboration and synergies with various related projects and initiatives have developed throughout the project period allowing for evaluation of the achievements.

The MTE will benefit the NAFORMA project by providing the necessary guidance and direction for the sustainable, successful and timely completion of the project work. By securing the projects continued progress, the MTE will also benefit the various partner institutions and eventually also the nation of Tanzania when the resulting data of NAFORMA is utilized in promoting sustainable forest management.

3. Progress and current status of NAFORMA

Many changes have taken place in policy and operational environment since the compilation of Project Document and launching of NAFORMA in May 2009. This has had an impact on the project's planning framework. Climate change has become a major concern leading to new and expanded information needs. Information needed for determining Reduced Emissions from Deforestation and Forest Degradation (REDD) and Greenhouse Gas (GHG) reporting have now been incorporated in NAFORMA, which covers mainland Tanzania and the Island of Mafia (i.e. excluding Zanzibar).

During the Design and Mobilization phase of NAFORMA (June-July 2009) a series of stakeholder consultations and workshops were held to clarify the national information needs. These consultations produced two major outputs:

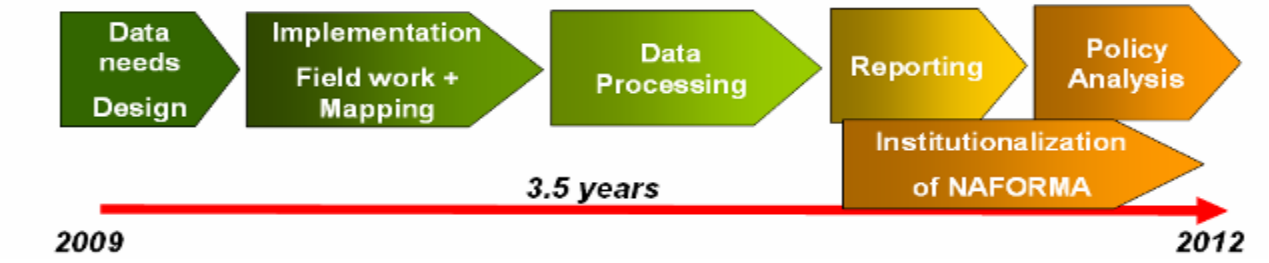
1. Output data and maps of NAFORMA should be of a resolution that would produce sufficiently detailed information at sub-national level, possibly even at District Level.
2. The data produced by NAFORMA should be REDD+ compliant and form the basis of Forest Carbon Monitoring in Tanzania.

The new national and international requirements to the contents and accuracy of NAFORMA data necessitated a further development of the sampling design and inventory methodology. During the period August 2009 – January 2010 the NAFORMA sampling design and

methodology was developed through FAO-FIN in cooperation between Finnish Forest Research Institute (Metla), Sokoine University of Agriculture (SUA) and NAFORMA. The methodology as well as manuals and field forms for the biophysical and socio-economic component were developed during the period November 2009 - March 2010) and consequently the field teams received a total of 4 weeks training in NAFORMA methodology.

The changed environment and the widened scope of NAFORMA justified the revision of the Project Document in 2010. The revision was completed and the new Project Agreement signed in December 2010. The GoF contribution to the Project was increased by 2 MEUR,in addition to the original 1,929,593 EUR . The duration of the project was extended by 8 months, in addition to the original 36 months. The total donor contribution for NAFORMA is thus 3,929,593 EUR and the total timeframe for the Project is 44 months (April 2009 – December 2012) with the phases indicated below.

Figure 1: NAFORMA Phases



In the revised Project Document the new methodology and sampling design are explained in detail. The objective "*Develop Tools and methods for integration of REDD+ MRV (Monitoring, Reporting and Verification)to National Forest Monitoring and Assessment (NFMA) methodology"* was added as the seventh immediate objective while some of the outputs and activities were updated. Hence the seven immediate objectives of NAFORMA are:

I. Establish a broad consensus at the national level on the process and approach to NAFORMA in Tanzania, taking into account national users information requirements for planning and sustainable management of the forestry resources and the country's obligation of reporting to the international processes.
II. Strengthen the capability of the FBD to collect, analyze, update and manage the needed information on forests and trees under NAFOBEDA.
III. Develop a national database/dataset on forests and trees compatible with NAFOBEDA and other forestry related information systems.
IV. Prepare national maps of forests and land uses based on harmonized, classification and forest related definitions, with compatible storage and retrieval under NAFOBEDA.
V. Undertake a national assessment of the forest and trees outside forest resources with the aim to create an information base according to national (NAFOBEDA) and international requirements and to set up a long term monitoring system of the resources
VI. Define long term monitoring program of the forestry resources, design specific and management oriented inventory in priority areas and formulate projects
VII. Develop tools and methods for integration of REDD+ MRV to NFMA methodology

The outcomes and activities under each objective as well as project budget are presented in the revised Project Document.

FAO-FIN has furthermore been supportive through technical experts recruited through FAO HQ. They have been supporting the work of the Technical Working Groups (TWGs) (Mapping, Inventory, Database and Quality Assurance) during the Preparatory and Executing Phases partly in DSM through short term visits, partly through training courses and remote support. This support has been essential for conducting training of field teams and developing the didactic material for training and field work and for the construction of the NAFORMA database as well as for improving the homogenization and quality of field measurements.

Field work of NAFORMA started in May 2010 with 5 regular teams and 1 Quality Assurance (QA) team. After receiving 14 new project vehicles in November 2010, the number of field teams was increased to 10 regular teams and 1 QA team. The field component was upscaled to full size in February 2011 meaning that 16 field teams and 2 quality assurance teams have been active from February 2011.

As of late March 2011, NAFORMA cooperates with a number of other initiatives that will have mutual benefits with NAFORMA e.g.:

- Google Earth Outreach – ongoing cooperation on data collection devices and Open Data Kit software, platform for presentation of results and monitoring progress and the use of high resolution satellite imagery to support the field work. Memorandum of Understanding has been signed.
- UN-REDD – Identifying and bridging existing knowledge gaps (e.g. in allelometrics, expansion factors etc). The first practical synergies were found in mapping – after two joint trainings the mapping unit of UN-REDD was merged with NAFORMA TWG Mapping forming the ”FBD Mapping Unit”.
- Use of LiDAR (light detection and ranging) data in the Multi-source Inventory in collaboration with SUA and the University of Life Sciences of Norway (UMB) in connection with planned LiDAR biomass assessment in Tanzania.
- Use of methodology and software from FAO FRA Remote Sensing Survey (FRA RSS) is being considered to jointly undertake the land cover change assessments of NAFORMA and UN-REDD and thus provide a possible foundation for establishing the reference emission level of Tanzania.
- Tanzania is a pilot country for the GEO (Group on Earth Observations) forest carbon tracking task and synergies have been identified and developed in collaboration with the Norwegian Space Agency.
- NGOs conducting localized Forest Assessments (e.g. Jane Goodall Institute and Tanzania Forest Conservation Group).

NAFORMA sampling design and methodology was finalized by early March 2010 thereby making it possible for the above mentioned initiatives and other possible actors to link with NAFORMA in the most rational manner.

After the first 6 months of field work and with the constructive feedback from the field teams, the manuals and field forms were revised into their final format in December 2012. In this revised version a section regarding soil sampling for soil carbon (biophysical) and governance (socioeconomic) parameters for REDD+ were included in the manuals and field forms and hence form part of the widened scope of NAFORMA.

4. Scope of evaluation

The MTE will not focus narrowly on methodology, remote sensing and technical issues. While the quality of the data generated by NAFORMA is important, the focus should also be on securing how this data is put to use and how to secure NAFORMA in the long perspective, where a number (app. 850) permanent sample sites have to be re-measured at regular intervals and the data continually maintained.

The MTE will therefore also focus on securing the policy/institutional linkages, ensuring the optimal use of NAFORMA data (biophysical, socio-economic and governance), including relations to REDD+ MRV needs as well as recommendations for how to ensure sustainability of NAFORMA in the post project period.

The MTE will provide the relevant and concise guidance and recommendations to the 3 parties (GoT, GoF and FAO) to make any necessary adjustments in the project setup and operations while the project is still in the operating phase in order to:

- Achieve the outcomes and activities of the Project Document
- Secure linkages (policy/institutional)
- Optimize the use of NAFORMA data
- Secure continuation of NAFORMA in the post project phase

The recommendations will be structured as described under section 5 below.

5. Key issues for evaluation

The Project Document of National Forest Monitoring and Assessment of Tanzania (NAFORMA) calls for a MTE to be conducted 18 months after the start of the project. The MTE will evaluate the below mentioned issues I-V and provide structured evaluation of relevance, efficiency, effectiveness, impact and sustainability of the NAFORMA activities. NAFORMA efforts to mainstream gender and HIV awareness should also be evaluated.

I Review of Project Progress with respect to expected Outcomes

1. Obtain detailed insight in the progress of NAFORMA since fielding of CTA in April 2009.

2. Review the progress of NAFORMA with reference to the Logical Framework of the Revised Project Document and assess to what degree the Project has met the required outcomes and carried-out planned activities. Assess to which degree the indicators have been met.

3. In light of the planned activities and available resources, assess the extent to which NAFORMA will meet the required outcomes and implement activities as planned in the Project Document. Assess to which degree the indicators can be expected to be met.

4. Provide guidance on technical and organisational adjustments to current practices that are necessary to satisfactorily meet the required outcomes, and make suggestions as appropriate to adjust activities and indicators if deemed necessary.

II Review of project organisational setup, key person functions, and Work plans of the

Technical Working Groups with a view to sustainability in the Post Project Period

5. Review the Organisational setup and provide guidance and recommendations for adjustments in the following components. (Organigram in Appendix 1)

    - TWG Inventory
    - TWG Mapping and remote sensing
    - TWG Data management
    - TWG REDD+ compliance
    - Quality Assurance
    - Management and institutionalization

6. Review the Terms of Reference of the professional FAO staff employed on NAFORMA (CTA, National Consultant (NC) Inventory, NC Mapping and Associate Professional Officer) and the National Staff of the MNRT for whom ToRs were issued at the start of the project (NPC, ANPC and Heads of Technical Working Groups). Assess the degree to which the ToRs are appropriate to meet the project needs. Provide necessary guidance on areas in need of consolidation/adjustment.

7. Review the division of labour, communication flow and provide guidance and recommendations for adjustments.

8. Review the work plans of the technical working groups and assess to what degree they are able to be fulfilled during the project period. Identify possible threats to completing the tasks in time for the components mentioned under bullet 5:

9. Propose adjustments to setup to secure timely delivery and post project continuity including indicative timing.

III Review of Project Budget and assess sufficiency of remaining funds to reach targets.

10. Review the budget and provide an evaluation on whether the project outcomes and activities can be reached within the current budget. Recommend ways to reduce expenses if necessary.

11. Assess efficiency of the use of the project resources and prioritise various needs.

12. Assess the relevance of the collected data, how usable the data is for various stakeholders

13. Provide guidance on necessary adjustments to how targets can be achieved if there is an expected shortfall. This implies:
    - Suggestions for reducing expenses / levels of ambition.
    - Suggestions for pursuing increasing funding if possible.

14. Provide guidance on securing post project funding to make the forest inventory sustainable and nationally owned.

IV Review of Project Synergies with related activities.

15. Review the linkages with the NFP process and utilisation of the data

16. Review of linkage between NAFORMA and Component 2 and 3 of FAO-FIN. Makeconcise suggestions for adjusted / additional linkages

17. Review of established synergies with UN-REDD and other REDD / RS related activities. Concise suggestions are needed for adjusted / additional linkages.

18. Review the linkages and synergies with GEO/FCT, Google and other actors.

19. Review the established synergies with NGOs and provide concise suggestions for increased linkages.

20. Review the synergies with National Biomass Inventory Zanzibar + concise suggestions for increased linkages.

V Review of Progress in securing institutional memory and building national capacity with special emphasis on continuity in the post project phase.

21. Assess the degree to which the continuity of NAFORMA is secured in the post project period and how to guarantee the use of the data and information among stakeholders.

22. Make proposal on how NAFORMA can be institutionalized in Tanzania and what are the urgent actions to take.

23. Identify weak links and provide recommendations for strengthening measures, structured in accordance with the Logical Framework of the Project Document and with clear allocations of responsibilities in line with the NAFORMA organisational setup

    - Inventory
    - Mapping and remote sensing
    - Data management
    - Quality Assurance
    - REDD+ compliance
    - Management and institutionalization
    - Role of FAO and GoF

24. Provide advice on the need for a final project review / evaluation towards the end of the project period.

6. Evaluation methodology

The evaluation will be carried-out by an independent team. Methodology and data collection will take the form of studies, analysis and evaluation of achieved results and approach of NAFORMA. The evaluation process will be attentive to developing findings, conclusions and

recommendations based on evidence and broad consultation among stakeholders, in a way to capture the widest possible range of viewpoints.
The Evaluation will be based on data collected through the following means:

-
- Desk Review of relevant project documents and reports, technical and normative papers and meeting reports ;
- Semi-structured interviews with all relevant stakeholders including representatives from:
  - Primary stakeholders: MNRT, FAO and MFA
  - Collaborating institutions:
    i. United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UNREDD),
    ii. Institute of Resource Assessment,
    iii. Development Partner Groups - Environment,
    iv. Etc

  - NGOs implementing REDD-related projects:
    v. Tanzania Forest Conservation Group (TFCG),
    vi. Jane Goodall Institute (JGI),
    vii. World Wide Fund for Nature (WWF),
    viii. etc …

  - NAFORMA technical staff including field teams.

The findings will for each key issue mentioned in section 5 be quantified using a scale a 1 – 5 as follows for each investigated item to help identify the areas most in need of focus/consolidation:

1: Substandard performance
2: Mildly dissatisfactory performance
3: Mediocre Performance
4: Satisfactory performance
5: Superior performance

7. Evaluation phases and deliverables

The MTE will last for 30 working days and encompass the following phases:

The preparatory Phase (Team leader - prior to field visit - 5 days):
- Desk review of Project Documents and Project Agreements, Manual and Reports, Project Performance Evaluation Report etc.,
- Skype sessions and initial correspondence with NAFORMA to clarify issues

The Inquiry Phase (All team - in Tanzania - 15 days):

Tentative timing	**Topic**
8th May 2011	Travel to Dar es Salaam
9th May 2011	First team meeting:

	- Endorsement of ToRs and agreement within the ET on the final mission agenda and tasks - Agreeing on structure, methodology and division of labour of the final evaluation report
10th May 2011	Formal Introductions and briefing of mission and targets with key project stakeholders (FAO project management team; donors; key partners) Fact finding: Getting the picture of NAFORMA activities progress and challenges. Plenary meeting with NAFORMA to introduce the MTE and the work ahead. Revising schedule and workplan for the MTE
11th May 2011	Field visit to permanent sample cluster in the vicinity of Dar es Salaam
12th May 2011	Fact finding Meetings with NAFORMA Technical Working Groups and NAFORMA management Budget review
13th May 2011	Interviews NPC, ANPC, CTA, Head Technical working groups, National Consultants Inventory, Mapping and National Consultant UN-REDD MRV
14th May 2011	Compiling findings and follow up work.
15th May 2011	Compiling findings reporting
16th May 2011	Discussion with NAFORMA Project Technical Unit
17th May 2011	Second round of fact finding and interviews including review of budget
18th May 2011	Second round of fact finding and interviews
19th May 2011	Compiling findings and follow up work as a team in country
20st May 2011	Compiling findings and follow up work as a team in country
21nd May 2011	Mission debriefing and presentation of an aide memoire to the 3 parties
22nd May 2011	Travel from Dar es Salaam

The evaluation report drafting phase (Team leader - home-based - 10 days):
Drafting of final evaluation report and consultation with team members
Submission of draft report to GoT, GoF and FAO for comments
Finalization of the report within 5 days upon reception of the comments

Evaluation report:

The ET is entirely responsible for its final report that will have to reflect an independent analysis, which will not necessarily reflect the opinions of stakeholders interviewed. Notwithstanding, preliminary conclusions and recommendations will be fully discussed with all stakeholders in order to reach a reasonable consensus.
It is expected from the evaluators that they produce conclusions that are grounded on clear evidence and give way in a logical way to the recommendations.

The report will be structured according to the standard outline provided in Appendix 2. A first draft of the report will be presented to all project stakeholders for comments before being finalized by the ET leader within two weeks after he has received all comments.

The final report will be submitted to all project stakeholders through the project coordination team, which will then have to prepare a management response, explaining for each recommendation, whether they are accepted or not and what actions will be taken as a result of these recommendations. The final evaluation report should be submitted to MNRT, FAO and MFA Finland by 15th June 2011

8. Organization of the evaluation

Evaluation team composition:

Each of the 3 partners (GoT, GoF and FAO) will appoint one member who is not working on NAFORMA to participate full time for the full duration of the evaluation work. The team members shall have solid academic, practical and organisational background so that the combined skills of the team mentioned below are covered and the ToRs able to be covered in depth by the combined efforts of the team.

General minimum requirements for MTE team members will be M.Sc in relevant area of expertise and minimum 10 year working experience including in developing countries project.

- The combined skills of the ET should encompass
    - Forest Inventory
    - Quality Assurance
    - Institutional Building / Organisational issues
    - Socio-economy and Governance of forests.

Roles and responsibilities of other stakeholders:

FAO and non-FAO stakeholders engaged in the design and management of the project will be regularly consulted from the initial to the last phases of the evaluation, to clarify the facts, share their views and provide the team with the necessary reference documentation. They will be requested to comment the draft evaluation report, with concrete and evidence based remarks. More specifically:

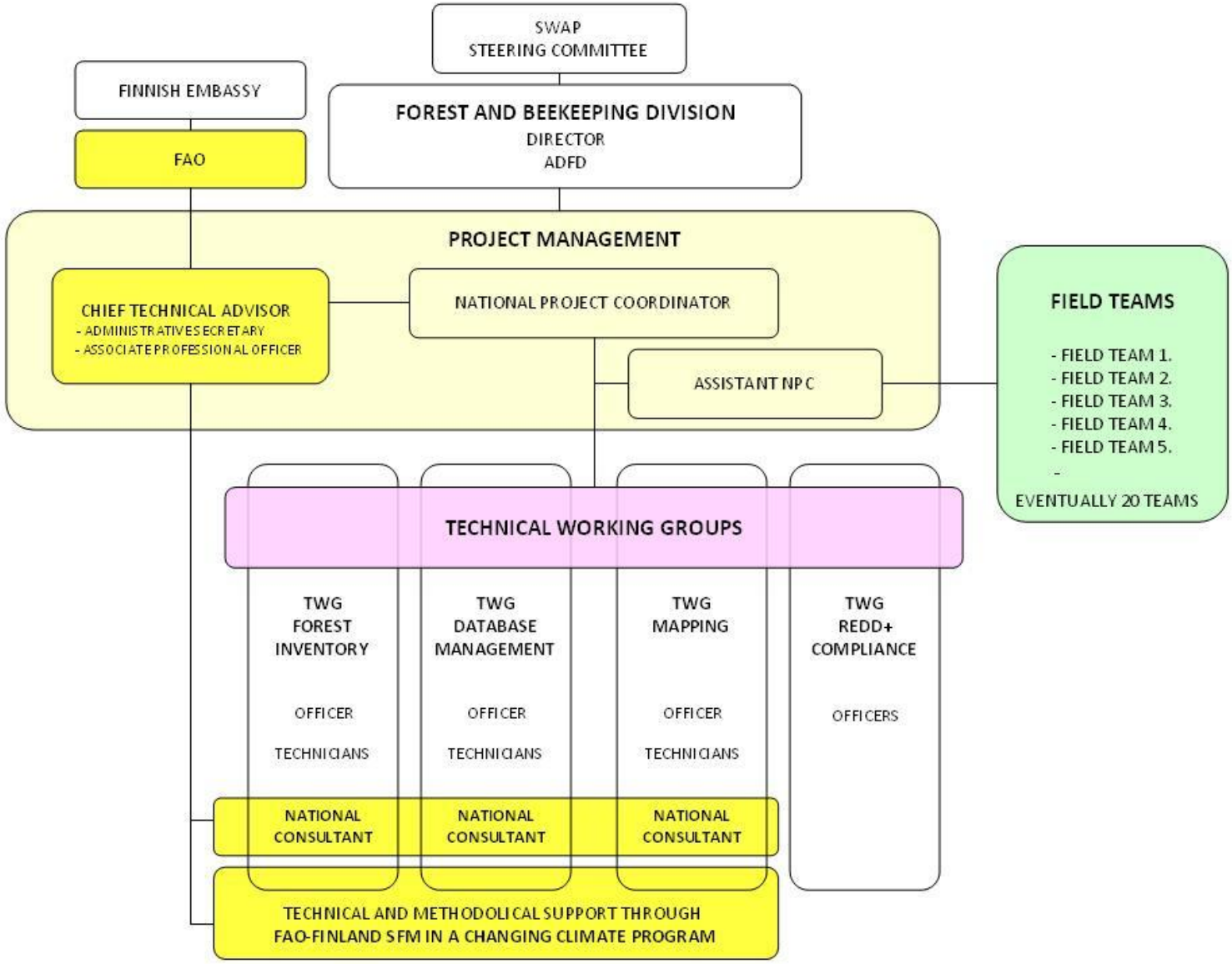
- FAO project coordination team in Tanzania provide the necessary logistical, administrative and technical support to the mission – which will include a 2 week working session at MNRT in Dar es Salaam.

- MNRT:
  MNRT will provide the office space and allocate staff time as needed to support the mission (interview-time, practical support, etc).

  Consultation of project stakeholders will be arranged by NAFORMA Staff (CTA and NPC). Interviews can be conducted at FAO or at FBD

- The office of Evaluation (OEDD) will be requested to provide peer review comments on the TORs and evaluation reports.

APPENDIX 1: NAFORMA ORGANISATIONAL SETUP



Yellow fields - FAO support

APPENDIX 2:

FAO Office of Evaluation

Contents and outline for project evaluation reports

Background for project and programme evaluation in FAO

Evaluation provides accountability and contributes to corporate learning, feeding lessons into a robust feedback loop: through these functions it gives both Member Countries and Management a more in-depth understanding and objective basis for decisions in the governing bodies and in the Organization's planning process. Evaluation also provides a sound basis for improvements in the Organization's programmes in terms of their relevance to countries, definition of objectives, their design and implementation.[3]

At the level of projects and programmes, evaluation aims at improving their performance in meeting their objectives, providing accountability and deriving lessons for better project and programme formulation and implementation in future. An evaluation should provide information that is credible and useful, that can be incorporated into the decision-making process of donors, recipients and implementing agencies and that can be used by a broader audience to learn lessons.

A project/programme evaluation must provide stakeholders with a systematic and objective assessment of the relevance, efficiency, effectiveness, impact and sustainability of the intervention, as well as of its performance in relation to gender mainstreaming and social inclusion, through the analysis of the design, implementation process, outputs, results and, if possible, impact of the intervention.

An evaluation report should also provide clear, unambiguous and realistic recommendations for future measures to consolidate project/programme results and achieve the intended objectives, and/or tackle related emerging issues.

Evaluation reports should answer all questions raised in the terms of reference; if an ET is unable to comply with this requirement for external reasons, these should be provided.

Format of a project evaluation report

An evaluation report is a self-standing document, which should not need reference to other documents/reports to provide background and evidence for its conclusions and recommendations.

An evaluation report should be reader-friendly, concise and clear. In order to facilitate readability, the following suggestions are made about the format:

the main text should be in the range of 15-18,000 words, excluding executive summary and annexes;

chapters and paragraphs should be numbered to facilitate reading and cross-reference;

the table of contents and list of acronyms should be inserted at the beginning of the report.

This document illustrates the outline and provides explanations for the structure of any project and programme evaluation report in FAO. It should be shared with all ET members, be included as annex in the evaluation Terms of Reference and discussed with the Team Leader during the briefing session with the Office of Evaluation.

[3] From the Charter for the Office of Evaluation, XXX

Table of contents of the evaluation report

Acronyms

1. Abbreviations should be written in full the first time they appear, and included in the list of acronyms when they are used repeatedly along the text.

Executive Summary

2. The Executive Summary should:

- be in length approximately 10-15% of the main report, excluding annexes;
- provide key information on the evaluation process and methodology, and on the project itself;
- illustrate key findings and conclusions;
- list all recommendations, in summarized form if necessary.

3. Listing all recommendations will help in the drafting of and cross-checking the Management Response[4].

1 Introduction

1.1 Evaluation background

4. Provisions for evaluation in the ProDoc, any other reasons for mounting the evaluation, purpose (midterm or erminal evaluation), mission composition and dates. ToR in Annex I, people met and mission itinerary in Annex II.
5. Project duration, starting and closing dates, initial and current total budget.

1.2 Methodology of the evaluation

2 Context of intervention

6. Description of the methodology adopted by the mission.

2.1 National context

7. Brief description of the national context relevant to the project, including major development challenges in the area of the intervention, political and legislative issues, etc.

2.2 Origins of the Project

8. Description of earlier related projects and/or FAO support in the same area of work, how the project was identified and developed; if relevant, other related UN and bilateral interventions

2.3 FAO's comparative advantage

9. Brief assessment of the comparative advantage for FAO to be implementing/executing the project.

3 Assessment of project concept and relevance

3.1 Project theory

[4] The Management Response is the written reply by FAO to the evaluation report; it illustrates acceptance or justified rejection, of recommendations, including actions, responsibilities and time plan for their implementation.

10. Assessment of the strategy and theory of change underpinning the project, including its internal coherence[5] and degree of innovativeness.
11. The Theory of Change describes the assumptions that stakeholders use to explain the change process represented by the change framework. Assumptions explain both the connections between early, intermediate and long term outcomes and the expectations about how and why proposed interventions will bring them about

3.2 Project objectives and logical framework

12. Description and critical assessment of project development and immediate objectives;
13. Critical assessment of:
    - the links and causal relationships between inputs, activities, outputs, outcomes and impact (immediate and development objectives);
    - relevance and appropriateness of indicators;
    - validity of assumptions and risks.

3.3 Project design

14. Analysis of the project strategy and structure including:
    - institutional set-up;
    - approach and methodology
    - management arrangements;
    - time frame and resources;
    - work plans; and
    - stakeholders' and beneficiaries identification.

3.4 Project relevance

15. Analysis of the extent to which the project's objectives and strategy were consistent with country needs and policies, with beneficiaries' requirements, at the time of project approval and at the time of the evaluation.
16. Relevance of the project to FAO National Medium-Term Priority Framework, if this was available at the time of project identification and formulation and/or at the time of the evaluation.

4 Project implementation

4.1 Project Budget and Expenditure

17. Analysis of project financial resources and financial management, including
    - rate of delivery and balance at the time of the evaluation;
    - relevance of budget allocations in the ProDoc and through Budget Revisions to project objectives; and
    - comment on information made available (if appropriate).

[5] Useful concepts here are: Internal Validity, which is the approximate truth about inferences regarding cause-effect or causal relationships; External validity which refers to the approximate truth of conclusions that involve generalizations, or the degree to which conclusions in your study would hold for other persons in other places and at other times;

4.2 Government support

18. Analysis of government's commitment and support to the project, in particular:
    - through financial and human resources made available for project operations; and
    - through policy and advocacy or uptake of Project's outputs and outcomes.

4.3 Project Management

19. Analysis of the performance of the project management function, including:
    - effectiveness and efficiency of operations management;
    - effectiveness of strategic management, including timeliness, technical quality, realism of annual work-plans;
    - set-up, efficiency and effectiveness of monitoring and internal evaluation processes;
    - elaboration and implementation of an exit strategy, if appropriate.

20. Analysis of the role and effectiveness of any other body of guidance and supervision (e.g. Steering Committee).

4.4 Technical and Operational Backstopping

21. Analysis of the extent and quality of operational/administrative and technical backstopping the project received from responsible units in FAO.

5 Project contribution to the development objective

5.1 Outputs and outcomes/results

22. Analysis of actual project outputs and outcomes; a complete list of outputs prepared by the project team should be included in annex.
23. Analysis of gaps and delays if any, and of their causes and consequences, between planned and implemented outputs and outcomes; and assessment of any remedial measures taken.
24. Assessment of how project outputs and outcomes did and/or could contribute to FAO's normative work and function.

5.2 Gender Issues

25. Analysis of how gender issues were mainstreamed including strategic and practical gender needs, in project objectives, design, identification of beneficiaries and implementation.
26. Analysis of how gender relations and gender equity were and will be affected by the project in the area/sector of intervention.
27. Analysis of gender equity in project management, including staffing.

5.3 Environmental Issues

28. Analysis of how environmental issues were mainstreamed in project objectives, design, identification of beneficiaries and implementation.

29. Assessment of the project contribution and/or impact on natural resources in terms of maintenance and/or regeneration of the natural resource base.

5.4 Sustainability: institutional, social, technical and economic

30. Assessment of the prospects for long-term use of project outputs and outcomes, including further development of acquired capacities, from an institutional, social, technical and economic perspective.

5.5 Overall effectiveness of intervention

31. Assessment of the extent to which the project has attained, or is expected to attain, its intermediate/specific objectives. Considerations about project relevance, costs, implementation strategy and quantity and quality of outputs and outcomes should be brought to bear on the aggregate judgment about the project value.
32. Contribution of the project to the attainment of the Millennium Development Goals (MDGs) and of the Internationally Agreed Development Goals (IADGs).

5.6 Project current and potential impact

33. Assessment of the current and foreseeable positive and negative impact produced by the Project, directly or indirectly, intended or unintended.
34. Likely contribution of the project to planned development objective.
35. Discussion of new emerging issues, if any.

6 Conclusions and Recommendations

36. Synthesis and conclusions of the main findings from the preceding sections: main achievements, major weaknesses and gaps in implementation, factors affecting strengths and weaknesses, prospects for follow-up. Conclusions may address specific evaluation questions raised in the Terms of Reference and should provide a clear basis for the recommendations which follow.
37. Each recommendation could be introduced by a paragraph providing the rationale for it.
38. Recommendations should be clearly addressed to each one of the concerned parties as appropriate, i.e. the Government, FAO at different levels (HQ, regional, sub-regional, national) and to the project management. Recommendations should be realistic, clear and unambiguous and stated in operational terms to the extent possible. Recommendations concerned with on-going project activities and those concerned with follow-up activities once the project is terminated, should be presented separately.
39. If the evaluation identified and discussed in the main text new areas of action to tackle existing/emerging related issues, referenced suggestions to the relevant stakeholder should be included here.

7 Lessons Learned (optional)

40. Only “new” lessons should be drawn, on any substantive, methodological or procedural issue, which could be relevant to the design, implementation and evaluation of similar projects or programs. Critical issues of a generic nature that would require attention in designing and implementing similar projects and programmes could also be raised.

Annex III: Itinerary and Persons Consulted

A: Itinerary

Date	Activity
Sun 8th May 2011	Travel to Dar es Salaam
Mon 9th May 2011	• Courtesy Call: Meet Ag. Director FBD • First team meeting: • -Endorsement of ToRs and agreement within the ET on the final mission agenda and tasks • -Agreeing on structure, methodology and division of labour of the final evaluation report
Tue 10th May 2011	• Formal Introductions and briefing of mission and targets with key project stakeholders (FAO project management team; donors; key partners) • Fact finding: Getting the picture of NAFORMA activities progress and challenges • Plenary meeting with NAFORMA to introduce the MTE and the work ahead • Revising schedule and workplan for the MTE • Budget review • Meet UN-REDD Coordinator & NC UN-REDD
Wed 11th May 2011	• Field visit to permanent sample cluster in the vicinity of Dar es Salaam
Thur 12th May 2011	• Meet the Finnish Embassy Counsellor Natural Resources • Meet the Norwegian Embassy Counsellor Environment & Climate Change • Interviews: TWG Head Database, NC Mapping, TWG REDD+ Compliance, NC Inventory
Fri 13th May 2011	• Interviews: ANPC, TWG Head Inventory & Head QA, CTA, NPC, APO
Sat 14th May 2011	• Compiling findings
Sun 15th May 2011	• Compiling findings
Mon 16th May 2011	• Attend Consultants presentation: Strategic planning of Finnish support to forestry in Tanzania. • Interviews: TWG Ag. Head Mapping, Mapping Staff, Field Crews • Compiling findings
Tue 17th May 2011	• Meet the Director FBD • Interview: NAFORMA Administrative Secretary • Meet the Assistant Director, Forest Development • Meet Assistant Director, Research, Training and Statistics and Ag CEO TFS • Compiling findings
Wed 18th May 2011	• Meet Assistant FAO Representative Programme • Visit NAFORMA Database and Mapping Facilities • Compiling findings

Date	Activity
Thur 19th May 2011	• Tel communication with Development Associates who also collaborate with TaTEDO • Tel Communication with Jane Goodall Institute Staff • Compiling findings
Fri 20st May 2011	• Meet Assistant Coordinator, NFP • Mission debriefing and presentation of an aide memoire to the 3 parties
Sat 21nd May 2011	Attend to comments from debriefing meeting
Sun 22nd May 2011	Travel from Dar es Salaam

B: People Met

S/N	Name		Position at the Time of Meeting
1.	Hon. P. Silima	Mr	Deputy Minister of Finance
2.	F.B. Kilahama	Dr	Director of FBD
3.	G. Mkamba	Ms	Assistant Director, Forestry & Beekeeping FBD
4.	J. Mgoo	Mr	Assistant Director, Forestry Development FBD
5.	M. Kagya	Ms	Assistant Director, Research, Training and Statistics FBD and Ag. CEO TFS
6.	M. Mäkelä	Ms	Counsellor, Natural Resources, Embassy of Finland
7.	I. Jorgensen	Mr	Counsellor, Environment/Climate Change, Norwegian Embassy
8.	E. Nashanda	Mr	Schedule Officer Catchment Forests & Nature Reserves, FBD REDD Manager, TWG REDD, National REDD Task Force Member
9.	E. Zahabu	Dr	UN-REDD National Consultant
10.	G. Kamwenda	Mr	TWG REDD+ Compliance
11.	R. Malimbwi	Prof	NAFORMA National Consultant, Inventory
12.	J. Otieno	Mr	ANPC - NAFORMA
13.	B. Mbilinyi	Prof	NAFORMA National Consultant, Mapping
14.	L. Tamminen	Mr	FAO – Associate Professional Officer
15.	M. Leppänen	Mr	FAO - FINLAND Forestry Programme
16.	E. Tomppo	Prof	FAO - FINLAND Forestry programme
17.	N.A. Chamuya	Mr	NPC - NAFORMA
18.	S. Dalsgaard	Mr	CTA - NAFORMA
19.	A. Akida	Ms	TWG Head Data Management
20.	R. Ernst	Mr	UN-REDD Coordinator, Tanzania
21.	A. Masota	Mr	TWG Head Inventory
22.	G. N. Axberg	Dr	Senior Research Fellow, Stockholm Environment Institute. Team Leader, Consultancy on Future Finnish Forestry Support to Tanzania
23.	P. Virtanen	Dr	Team Member, Consultancy on Future Finnish Forestry Support to Tanzania
24.	S.H. Kiluvia	Ms	Staff, TWG Mapping
25.	E. John	Mr	Ag. Head, TWG Mapping

26.	M. V. Kisima	Mr	Inventory Crew
27.	T.H. Assenga	Mr	Inventory Crew
28.	R. Lyimo	Ms	Inventory Crew
29.	W. Kitambala	Mr	Inventory Crew
30.	M. Mpangalala	Ms	Inventory Crew
31.	P. Almachius	Mr	Data Entry
32.	G. Malisa	Mr	Data Entry
33.	C. Gotifrid	Mr	Data Entry
34.	E. Mwasilu	Mr	Data Entry
35.	E.J. Ruhasha	Mr	Data Entry
36.	Kara Mgeni	Ms	Administrative Secretary (NAFORMA)
37.	B. M. Sulus	Mr	SHIVIMATA
38.	I. Kusimula	Mr	Team Leader, Field Crew No. 5
39.	L. Vesa	Mr	FAO International Consultant
40.	G. Runyoro	Mr	Assistant FAO Representative Programme
41.	H. Gau	Mr	Data Entry
42.	M. Kapina	Ms	Staff, TWG Mapping
43.	V. Haikwahi	Ms	Staff, TWG Mapping
44.	R. Otsyina	Dr	Development Associates/TaTEDO
45.	E. Nsoko	Mr	Jane Goodall Insitute
46.	S. Msemo	Mr	Assistant Coordinator, NFP
47.	S. Mwakalila	Prof	REDD Coordinator, WWF Tanzania Country Office
48.	B. Karani	Mr	Incharge NAFOBEDA Morogoro Rural District
49.	J. Makala	Mr	National Coordinator, Mpingo Conservation & Development Initiative

C: Participants to the De-briefing Meeting 20.5.11

S/N	**Name**		**Position at the Time of Meeting**
1.	V. Msusa	Mr	Ag. Assistant Director, Utilisation
2.	M. Mäkelä	Ms	Counsellor, Natural Resources, Embassy of Finland
3.	E. Nashanda	Mr	Schedule Officer Catchment Forests & Nature Reserves, FBD REDD Manager, TWG REDD, National REDD Task Force Member
4.	R. Malimbwi	Prof	NAFORMA National Consultant, Inventory
5.	J. Otieno	Mr	ANPC - NAFORMA
6.	B. Mbilinyi	Prof	NAFORMA National Consultant, Mapping
7.	L. Tamminen	Mr	FAO – Associate Professional Officer
8.	N.A. Chamuya	Mr	NPC - NAFORMA
9.	S. Dalsgaard	Mr	CTA - NAFORMA
10.	A. Akida	Ms	TWG Head Data Management
11.	A. Masota	Mr	TWG Head Inventory
12.	S.H. Kiluvia	Ms	Staff, TWG Mapping
13.	E. John	Mr	Ag. Head, TWG Mapping
14.	T.H. Assenga	Mr	Inventory Crew
15.	P. Almachius	Mr	Data Entry
16.	G. Malisa	Mr	Data Entry
17.	C. Gotifrid	Mr	Data Entry

18.	E. Mwasilu	Mr	Data Entry
19.	E.J. Ruhasha	Mr	Data Entry
20.	Kara Mgeni	Ms	Administrative Secretary (NAFORMA)
21.	H. Gau	Mr	Data Entry
22.	M. Kapina	Ms	Staff, TWG Mapping
23.	S. Msemo	Mr	Assistant Coordinator, NFP
24.	M. Kiboga	Mr	FBD, Plantations
25.	P. Kalunde	Mr	FBD
26.	B. Bahane	Mr	FBD
27.	G.D. Vincent	Mr	FBD

Annex IV: Project Document revised Nov 2010 (see attachment)

Annex V: List of project activities/outputs

Manuals and Species Lists	
M01 - 2010	Biophysical Field Manual
M02a-2010	Household Survey
M02b-2010	Household Survey_kiswahili
M04a-2010	Key Informant Interview Forms
M04b-2010	Key Informant_kiswahili
M05 - 2010	Socioeconomic Field Manual
M06a - 2010	Species List - sorted by Latin names
M06b - 2010	Species List - sorted by Vernacular names
Progress Reports	
PR000	Progress report April 2009 - June 2009
PR001	Progress report July 2009 - Dec 2009
PR002	Progress report January 2010 - June 2010
PR003	Progress report July 2010 - Dec 2010
PR004	Progress report Dec 2011 - Mar 2011
Technical Reports	
TR01-2009	Information Needs Assments Biophysical September 2009 (*Malimbwi, Zahabu ,and Tomppo*)
TR02-2009	Socioeconomic data needs and sampling design August 2009 (Kessy and Andersson)
TR01-2010	Sampling Design Study (*Tomppo et al*)
TR02-2010	Quality Assurance for NAFORMA (*Haakanen*) June 2010
TR03-2010	Paper on Soil Carbon in NAFORMA (*Dr. Kaaya)* October 2010
TR04-2010	NAFORMA Forest Governance monitoring for REDD+ (*Andersson, Leppänen and Rametsteiner*)
TR05-2010	Data analysis socioeconomic (*Kingazi and Ylhäisi)* November 2010
TR06-2010	Data analysis biophysical (*Shemwetta*) November 2010
TR07-2010	Botanists Report Lushoto Oct 2010
TR01-2011	Final Report - Support to NAFORMA Mapping and Remote Sensing (Jan - Feb 2011) (*Haapanen*)
TR02-2011	Final Report Mid Term Evaluation (*Alegria, Chamshama and Erkkilä*) In press.
TR03-2011	Final Report - Support to NAFORMA Mapping and Remote Sensing (April - June 2011) (*Haapanen*)
TR04-2011	Soil Carbon Working Paper (*Kaaya, Guendehou*). In Press.
Workshop Proceedings	
WP01 2009	Intended as report from launch for NAFORMA May 2009. Not compiled / missing

WP02 2009	Technical Workshop 30.06-01.07.2009
WP03 2009	NAFORMA Training Workshop November 2010
WP04 2009	NAFORMA Technical Workshop November 2010 (Allocation of tasks to TWGs - report not done)
WP05 2009	Number redundant
WP06 2010	NAFORMA Socioeconomic Training Jan 2010
WP07 2010	NAFORMA Biophysical Training Mar 2010
WP08 2010	Handeni Workshop - Plenary Session at the end of fieldwork
WP09 2010	NAFORMA Plenary Workshop Bagamoyo (workshop report still to be delivered)

Annex VI: List of consultancies and Backstopping Missions

A: Short-term Consultants

2009

Name	Institution	Topic	Duration	Time	Funding
Prof. P.K. Andersson	University of Colorado	Conducting Socioeconomic information needs assessment	28 days	June – Aug	FAO-FIN
Prof. J.F Kessy	SUA	Conducting Socioeconomic information needs assessment	40 days	June – Aug	NAFORMA
Prof. Rogers E. Malimbwi	SUA	Conducting biophysical information needs assessment	50 days	June – Aug	NAFORMA
Dr. Eliakim Zahabu	SUA	Conducting biophysical information needs assessment	40 days	June – Aug	NAFORMA
Prof. Erkki Tomppo	Finnish Forest Research Institute	Conducting biophysical information needs assessment	28 days	June - Aug	FAO-FIN
Prof. P.K. Andersson	University of Colorado	Developing Socioeconomic manual	~1 month	Oct 2009– Jan 2010	FAO-FIN
Prof. J.F. Kessy	SUA	Developing Socioeconomic manual and conducting training of field teams	~ 1,5 months	Oct 2009– Jan 2010	NAFORMA
Lauri Vesa	ForestCalc (Finland)	Developing biophysical Manual and conducting training of field teams (1-2 week fieldings in Tz)	~2 months	Oct 2009 – March 2010	FAO-FIN
Prof. Erkki Tomppo	Finnish Forest Research Institute	Developing sampling design for NAFORMA – in collaboration with FBD and SUA	?	Sept 2009 – Jan 2010	FAO – FIN
Prof. F.B.S. Makonda and C.K. Ruffo	SUA	Compiling National Species List for use in the NAFORMA	~1 month	Nov 2009 – Jan 2010	NAFORMA

2010

Name	Institution	Topic	Duration	Time	Funding
Markus Haakana	Finnish Forest Research Institute	Consultancy on developing QA system for NAFORMA	~1 month	March	FAO-FIN
Prof.	National	Analysis of Biophysical	~1 month	Oct – Nov	NAFORMA

Dunstan T.K. Shemwetta	Consultant	Data Collected May– Sept 2010			
Stephano P. Kingazi	National Consultant	Analysis of Socioeconomic Data Collected May– Sept 2010	~1 month	Oct – Nov	NAFORMA
Dr. Jussi Ylhäisi	International Consultant	Analysis of Socioeconomic Data Collected May– Sept 2010	~3 weeks	Oct – Nov	FAO – FIN
Dr. Sabin Guendehou	Finnish Forest Research Institute	Soil Carbon Sampling Design for NAFORMA	21 days	Aug	FAO-FIN
Dr. Jari Liski	Finnish Environment Institute	Soil Carbon Sampling Design for NAFORMA	21 days	Aug	FAO-FIN
Dr Abel Kaaya	SUA	Soil Carbon Sampling Design for NAFORMA + training of fieldteams and compiling section on soil sampling for biophysical manual	~1 month	Aug – Nov	NAFORMA
Prof. P.K. Andersson	University of Colorado	Co-author on study on Monitoring Forest Governance for REDD+	~1 month	June	FAO-FIN

2010

Name	Institution	Topic	Duration	Time	Funding
Dr Abel Kaaya	SUA	Soil Carbon Sampling Design for NAFORMA + training of fieldteams and compiling section on soil sampling for biophysical manual	~1 month	Aug – Nov	NAFORMA

2011

Name	Institution	Topic	Duration	Time	Funding
Reija Haapanen	Haapanen Forest Consulting (Finland)	Technical Support to NAFORMA Mapping and Remote Sensing – partly remote support – part in Tz	23 days	Jan – Mar	NAFORMA
Reija Haapanen	Haapanen Forest Consulting (Finland)	Technical Support to NAFORMA Mapping and Remote Sensing – partly remote support – part in Tz	30 days	April – June	NAFORMA
Total consultancy months, approximately			**22**		

B: Long-term Consultants & staff

LONG TERM NATIONAL CONSULTANTS

Prof. Rogers E. Malimbwi, NC Inventory, 24 months, November 2009 – November 2011

Dr. Mwanukuzi, NC Mapping, 12 months, November 2009 – December 2010

Prof. B. Mbilinyi, NC Mapping, 11 months, January – December 2011

Emmanuel Mwasilu, NC Database Management, 9 months, starting April 2011

NC Data Analysis, 12 months, to be started December 2011

Total long term national consultancies, 4approximately 68 months

SHORT TERM STAFF

Data entry clerks, 5 persons each 9 months

LONG TERM STAFF

Søren Dalsgaard, Chief Technical Advisor, 45 months, April 2009 – December 2012

Mgeni Kara, Administrative Secretary, 36 months, October 2009 – December 2012

Amana Selemani, Driver, 36 months, October 2009 – December 2012

ASSOCIATE PROFESSIONAL OFFICER (APO) PROGRAMME

Lauri Tamminen, 25 months, May 2010 – May 2012 (salary and benefits paid by the Government of Finland)

C: Technical backstopping

FAO-FIN HQ Technical backstopping missions to Tanzania

Mikko Leppänen, Programme Coordinator; supervision of the NAFORMA project ~5 x 1-week missions spread over 2 years

Prof. Erkki Tomppo, Forest Inventory Specialist; TWG of Forest Inventory 1 x 1-week mission May 2011

Gino Miceli, Forest Information Systems Specialist; TWG Database Management 1 x 1-week mission November 2009

Dr. Anssi Pekkarinen, Remote Sensing & Forest Monitoring Expert; TWG Mapping ~5 x 1-week missions spread over 2 years

+ almost weekly Skype sessions between FAO HQ and TWGs Database Management & Mapping

Total backstopping in Tanzania, approximately 3 months

Annex: VII: REPORT OF EQUIPMENT PURCHASED

Annex VII Table 1: Vehicles

Qty	Description of item (s) (Make, Model, Reg No.)	Supplier	Date of purchase	Cost In local currency	Cost In JPY	Field Payment authorization number	Object of expenditure
1	Toyota Land Cruiser Hard top, Diesel (11-seater) Model:HZJ76R-RJMRS Chassis No. JTEEB71J707010236 Reg. No. DFP 7301	Toyota Motor Corp, Japan	October, 2010		2,797,940	PO No. 253135	Project use
1	Toyota Land Cruiser Hard top, Diesel (11-seater) Model:HZJ78R-RJMRS Chassis No. JTEEB71J907010237 Reg.No. DFP 7302	"	"		2,797,940	"	"
1	Toyota Land Cruiser Hard top, Diesel (11-seater) Model:HZJ76R-RJMRS Chassis No. JTEEB71J907010248 Reg.No. DFP 7303	"	"		2,797,940	"	"
1	Toyota Land Cruiser Hard top, Diesel (11-seater) Model:HZJ76R-RJMRS Chassis No. JTEEB71J307010251 Reg.No. DFP 7304	"	"		2,797,940	"	"
1	Toyota Land Cruiser Hard top, Diesel (11-seater) Model:HZJ76R-RJMRS Chassis No. JTEEB71J307010235 Reg.No. DFP 7300	"	"		2,797,940	"	"
1	Toyota Land Cruiser Hard top, Diesel (10-seater) Model:HZJ76R-RKMRS Chassis No. JTERB71J900058508 Reg.No. DFP 7306	"	"		2,906,486	"	"
1	Toyota Land Cruiser Hard top, Diesel (11-seater) Model:HZJ78R-RJMRS Chassis No. JTEEB71J07010207 Reg. No. DFP 7298	Toyota Motor Corp, Japan	October, 2010		2,797,940	"	"

Qty	Description of item (s) (Make, Model, Reg No.)	Supplier	Date of purchase	Cost In local currency	Cost In JPY	Field Payment authorization number	Object of expenditure
1	Toyota Land Cruiser Hard top, Diesel (11-seater) Model:HZJ76R-RJMRS Chassis No. JTEEB71J107010233 Reg.No. DFP 7299	"	"		2,797,940	"	"
1	Toyota Land Cruiser Hard top, Diesel (10-seater) Model:HZJ76R-RKMRS Chassis No. JTERB71J200058530 Reg.No. DFP 7311	"	"		2,906,486	"	"
1	Toyota Land Cruiser Hard top, Diesel (10-seater) Model:HZJ76R-RKMRS Chassis No. JTERB71J000058526 Reg.No. DFP 7310	"	"		2,906,486	"	"
1	Toyota Land Cruiser Hard top, Diesel (10-seater) Model:HZJ76R-RKMRS Chassis No. JTERB71J800058516 Reg.No. DFP 7308	"	"		2,906,486	"	"
1	Toyota Land Cruiser Hard top, Diesel (10-seater) Model:HZJ76R-RKMRS Chassis No. JTERB71J100058499 Reg.No. DFP 7305	"	"		2,906,486	"	"
1	Toyota Land Cruiser Hard top, Diesel (10-seater) Model:HZJ76R-RKMRS Chassis No. JTERB71J500058523 Reg.No. DFP 7309	"	"		2,906,486	"	"
1	Toyota Land Cruiser Hard top, Diesel (10-seater) Model:HZJ76R-RKMRS Chassis No. JTERB71J600058515 Reg.No. DFP 7307	"	"		2,906,486	"	"
14	**TOTAL**				**39,930,982**		
7	Dual Spare wheel bracket	ZapTrap, Dsm	17/12/2010	6,300,000.00		FRURT/10/206	Project use
7	Dual Spare wheel bracket S/Wagon	"	"	6,300,000.00		"	"

Qty	Description of item (s) (Make, Model, Reg No.)	Supplier	Date of purchase	Cost In local currency	Cost In JPY	Field Payment authorization number	Object of expenditure
	Decoration on hand over ceremony	Dina Flowers, Dsm	12/11/2010	350,000.00		FRURT/10/170	"
1	Remote control unit for winch	Kjaer & Kjaer, Denmark	25/3/2011		368.00	TZA/2011/12	"
1	Tow rope	"	"		150.00	"	"
	TOTAL			**12,950,000.00**	**518.00**		

Annex VII Table 2: Inventory Equipment

Qty	Description of item (s) (Make, Model, Reg No.)	Supplier	Date of purchase	Cost In local currency	Cost In JPY	Field Payment authorization number	Object of expenditure
32	GARMIN GPS Map 62S	Grube KG, Germany	28/10/2010		9,089.60	TZA/2010/140	Project use
22	SUUNTO Combined height and clinometer PM-5/1520 PC	"	"		1,613.70	" "	"
22	HAGLOF Caliper "Precision Blue", 65cm	"	"		1,193.50	"	"
22	SUUNTO Precision Compass KB-14/360 R	"	"		1,321.10	"	"
22	Fiberglass measuring tape, 30 m	"	"		447.70	"	"
22	Fiberglass measuring tape, 5 m	"	"		378.40	"	"
400	Marking tape of Paper	"	"		360.00	"	"
	TOTAL				**14,404.00**		
10	GARMIN GPS Map 60 CSX MO	GENEQ Inc. Canada	1/8/2010		3,500.00	TZA/2010/23	Project use
5	SXBlue II-L GPS with battery	"	"		15,727.50	"	"
5	NOMAD 800LC, Gray Numeric	"	"		9,975.00	"	"
20	Spherical Crown Densiometer	"	"		2,700.00	"	"
20	Munsel Soil Colour Chart	"	"		2,780.00	"	"
14	GPS	"	11/11/2010		35,983.50	TZA/2010/144	"
20	Small Generators	Lila Kilosa, Dar es Salaam	13/8/2010	27,000.000.00		FRURT/10/105	"

Qty	Description of item (s) (Make, Model, Reg No.)	Supplier	Date of purchase	Cost In local currency	Cost In JPY	Field Payment authorization number	Object of expenditure
50	Portable First Aid Kits	Labdeal, Dar es Salaam	24/5/2010		4,000.00	TZA/2010/57	"
22	Sony Digital Cameras	Simply Computers, Dsm	31/12/2009		10,714.00	FRURT/09/111	"
40	Soil sampling wood	Tarakea Chamber, Dsm	10/1/2011	400,000.00		FRURT/10/232	"
22	Muttock & hoe	Salum H. Abdullah, Dsm	31/12/2010	187,000.00		FRURT/10/23	"
30	Hammers	Labdeal, Dar es Salaam	12/11/2010		315.00	FRURT/10/170	"
14	Iron Jerrycans	"	"		728.00	"	"
20	Vehicle placed First Aid Kits	NY Company, Dsm	5/11/2010		4,000.00	TZA/39/2010	"
60	Dark blue coveralls free size	Mwalu Gen. Ent, Dsm	25/11/2010	2,970,000.00		FRURT/10/195	"
	TOTAL			**3,557,000.00**	**90,423.00**		
60	Rain coats	Mwalu Gen. Ent, Dsm	25/11/2010	1,920,000.00		FRURT/10/195	"
60	Leather boots	"	"	5,270,000.00		"	"
60	Gumboots	"	"	2,550,000.00		"	"
100	Brack pipes 2½	Super Hardware Store, Dsm	10/11/2010	900,000.00			"
21	Binoculars size 10 x 25"	Labdeal, Dar es Salaam	1/9/2010		1,648.50	TZA/2010/119	"
50	Outdoor Light Weight Tents	Labdeal, Dar es Salaam	6/9/2010		8,750.00	FRURT/10/130	"
100	Field knives	Ammy Solution Ltd, Dsm	3/6/2010		1,950.00	FRURT/10/69	"
24	Small leather hosters for Sony Cameras	"	"		852.00	"	"
50	Filing bags for field forms	"	"		1,530.00	"	"
150	Mosquito nets	Labdeal, Dar es Salaam	18/5/2010		930.00	TZA/2010/48	"
20	Memory cards for Sony Cameras	"	"		900.00	TZA/2010/47	"
15	Umbrellas	"	10/2/2011		232.50	FRURT/11/15	"
21	Special soil collecting bags	"	"		798.00	"	"
40	Outdoor Light Weight Tents	"	"		7,000.00	FRURT/11/18	"
20	Leather boots - Size 7	"	13/4/2011		840.00	FRURT/11/19	"
40	Leather boots - Size 8	"	"		1,680.00	"	"
20	Leather boots - Size 9	"	"		840.00	"	"
10	Leather boots - Size 10	"	"		420.00	"	"

Qty	Description of item (s) (Make, Model, Reg No.)	Supplier	Date of purchase	Cost In local currency	Cost In JPY	Field Payment authorization number	Object of expenditure
20	Rain boots - Size 7	"	"		580.00	"	"
40	Rain boots - Size 8	"	"		1,160.00	"	"
20	Rain boots - Size 9	"	"		580.00	"	"
10	Rain boots - Size 10	"	"		290.00	"	"
90	Rain coats	"	"		2,025.00	"	"
70	Coveralls Navy blue	OpenSanit Ent, Dsm	11/3/2010	1,960,000.00		FRURT/10/41	"
70	Long boots	"	"	1,750,000.00		"	"
	TOTAL			**14,350,000.00**	**33,006.00**		

Annex VII Table 3: Computers

Qty	Description of item (s) (Make, Model, Reg No.)	Supplier	Date of purchase	Cost In local currency	Cost In JPY	Field Payment authorization number	Object of expenditure
1	HP DL380G6 with Rack Mount Server	Simply Computers, Dsm	22/5/2010		16,830.00	TZA/2010/61	Project use
4	Transend 1 Terrabite external HDD	"	31/12/2009		880.00	FRURT/09/111	"
1	Hard Drive	"	2/2/2011	405,000.00		FRURT/11/26	
12	HP6730b Laptops	Simply Computers, Dsm	31/12/2009		18,000.00	FRURT/09/111	"
1	250GB HDD External	"	2/12/2010	240,000.00		FRURT/10/201	"
1	Mapping Computer	Computech, Dsm	14/9/2010		1,250.00	TZA/2010/122	"
3	USB Modems	Q-Print	20/9/2010	540,000.00		TZA/2010/125	"
5	HP 8000Elite E7500 Desktop Computers	Computech, Dsm	13/4/2011		5,250.00	TZA/2011/25	"
5	EATON 600VA UPSs	"	13/4/2011		306.80	"	"
4	DELL Optiplex 380 Desktop Computers	"	18/4/2011		5,040.00	TZA/2011/26	"
4	EATON 600VA UPSs	"	18/4/2011		289.62	"	"
	TOTAL			**1,185,000.00**	**47,846.42**		

Annex VII Table 4: Office Equipment

Qty	Description of item (s) (Make, Model, Reg No.)	Supplier	Date of purchase	Cost In local currency	Cost In JPY	Field Payment authorization number	Object of expenditure

Qty	Description of item (s) (Make, Model, Reg No.)	Supplier	Date of purchase	Cost In local currency	Cost In JPY	Field Payment authorization number	Object of expenditure
1	HP 5550 A3 Colour Laser Jet Printer	Simply Computers, Dsm	31/12/2009		4,865.00	FRURT/09/111	Project use
1	HP 5550N A3 Colour Laser Jet Printer	"	31/12/2009		4,865.00	"	"
1	Hot lamination Machine A3	"	31/12/2009		750.00	"	"
1	Glob Steel Filing cabinet	Furniture Centre, Dsm		327,999.80		FRURT/10/237	"
1	Nashuatec MP2000 Photocopier	BMTL, Dar es Salaam	18/6/2010		5,900.00	TZA/2010/78	"
1	HPD 1663 DeskJet Printer	Q-Print, Dar es Salaam	13/8/2010	70,000.00		TZA/2010/117	"
5	Printhead PF-03	Canon City, Dar es Salaam	13/8/2010	8,071,200.00		FRURT/10/106	"
1	HP Colour LaserJet 2025dn Printer	Computech ICS (T) Ltd	3/6/2010		775.00	TZA/2010/69	"
1	HP Colour LaserJet 2025dn Printer	Computech ICS (T) Ltd	8/6/2010		775.00	TZA/2010/73	"
1	ACCO Rexel Spiral Binding Machine	Q-Print, Dar es Salaam	9/6/2010	1,350,000.00		FRURT/10/72	"
1	Paper cutting machine	Q-Print, Dar es Salaam	"	60,000.00		"	"
2	Sony VPL-ES7 Projectors	Q-Print, Dar es Salaam	2/3/2010	2,303,500.00		FRURT/10/35	"
2	Mustek A3/A4 Flat Scanners	Simply Computers, Dsm	17/2/2010	450,000.00		TZA/2010/14	"
	TOTAL			**12,632,699.80**	**17,930.00**		

Annex VII Table 5: Consumables

Qty	Description of item (s) (Make, Model, Reg No.)	Supplier	Date of purchase	Cost In local currency	Cost In JPY	Field Payment authorization number	Object of expenditure
100	Ink Cartridges for Canon Plotter	Silmal Investment, Dsm	2/3/2010	15,980,000.00		FRURT/10/37	Project use
25	Toner Cartridges for LaserJet 2600n	Step In Ltd, Dsm	30/7/2010	4,867,500.00		TZA/2010/106	"
40	Toner Cartridges for HP LaserJet	Step In Ltd, Dsm		10,540,000.00		FRURT/10/170	"
	CP2025 Printer						
				31,387,500.00			

Annex VII Table 6: Stationary

Qty	Description of item (s) (Make, Model, Reg No.)	Supplier	Date of purchase	Cost In local currency	Cost In JPY	Field Payment authorization number	Object of expenditure
LS	Plan paper for Mapping	Architectural Stationery	23/7/2010	9,705,000.00		FRURT/10/91	"
LS	Stationery for office	Step In Ltd	16/2/2010	493,830.00		FRURT/10/26	"
				10,198,830.00			

Annex VII Table 7: Camping

Qty	Description of item (s) (Make, Model, Reg No.)	Supplier	Date of purchase	Cost In local currency	Cost In JPY	Field Payment authorization number	Object of expenditure
66	Mattresses	Fatemy Foams, Dsm	18/1/2011	1,122,000.00		FRURT/11/14	Project use
85	Sleeping bags	"	26/1/2011	10,200,000.00		FRURT/11/14	"
60	Mattresses	"	26/11/2011	540,000.00		FRURT/10/185	"
	TOTAL			**11,862,000.00**			

Annex VIII: Curriculum Vitae of Evaluation Team

Curriculum Vitae for James (Jim) Alegria

jalegria@fs.fed.us 503-808-6090

Current position Portland, OR: Forest Biometrician 1990 to present: My duties can be divided into two major components, I am the Interagency Program Manager for the vegetation inventory in Oregon and Washington for both the US Forest Service (USFS) and the Bureau of Land Management (BLM) on more than 11 million hectares and I provide statistical advice and support to both agencies as an internal consultant. As Program Manager, I provide regional leadership in the preparation and direction of the region's integrated resource inventory program in conjunction with the Forest Analysis & Inventory Program. This work also involves contract inspection and a quality assurance/quality control program

Other special projects that I led or had a senior position include:

- International Forestry Program: I participated in an USFS International Program in cooperation with USAID on March 3 - 16, 2007 to review the vegetation inventory methods in use including software, analytical procedures and field collection protocols. There were also a number of other issues as it relates to the growth and yield of charcoal producing trees and the quantification of charcoal production as part of a general accounting system that relates the inventory to cutting prescription to the production of charcoal. I also review and provided recommendations for the inventory of several non-timber species that produce marketable product (baobab and madd fruit and a gum from an acacia species) both internal (mainly Dakar) and international.
- Climate Change: I am a member of the Oregon/Washington BLM Climate Change group. This group is responsible for developing guidance to the field offices on incorporating climate change within their Resource Management Plans. On behalf of the group, I am the liaison for providing climate change effects on vegetation with vegetation researchers and contractors. I also promote interagency cooperation with the USFS in the Pacific Northwest to identify and fill information gaps.
- Forest Analysis: I am one of several Regional Inventory Coordinators that is working with FIA and the WO Resource Information Group of the Ecosystem Management directorship to develop an easy to use analytical and design tools to help NFS and the public to utilize strategic vegetation inventory data from NFS lands.
- Rangeland: I am currently on the sample design and data management working group that is extending Natural Resource Inventory of the Natural Resource Conservation Service (NRCS) to BLM lands in western US on 63 million hectares. The Natural Resource Inventory is the counter-part of the FIA on non-forested lands. In 2007, the FS, BLM and NRCS developed an interagency approach to monitor the nation's rangeland using eastern Oregon as a pilot. I was one of three members in the statistical design team that developed the sample design and analytical approach that melds the FIA and the NR inventories together to produce credible estimates of several key indicators in a pilot in eastern Oregon. The pilot included working with the lead field coordinators from both agencies and coordinating efforts with the FS RSAC for acquisition of large scale photography for this project.
- Remote Sensing: I have been involved in different aspects of remote sensing for a number of years including being the lead author for the development of a comprehensive remote sensing strategic plan for Oregon/Washington BLM which was adopted by the State Leadership Team in August 2009 and a co-lead for an interagency vegetation satellite mapping project (Interagency Vegetation Mapping Project - IVMP) for western Washington and western Oregon 2004.
- Monitoring: I had been heavily involved in implementation and effectiveness monitoring of the Northwest Forest Plan (NFP) prior to the creation of a full time monitoring group. I helped write a series of documents that began with the monitoring framework, and extended to interagency publications on implementation monitoring and effectiveness monitoring that further developed and refined the concepts of the framework paper. My experience working in the arena of resource policy and forested ecosystem with the NWFP resulted in two journal publications and a GTR on late-successional and old-growth forests in the Northwest.

- Special Status Species: I advise the Interagency Special Status Species Program on design and analysis issues on select rare species. Within the past couple of years, I have been involved in the design and analysis of Pale blue-eyed grass (Sisyrinchium sarmentosum), dung moss *Tayloria serrata* and *Tayloria mnioides*, Oregon spotted frog, and the fungi species *Albatrellus llisi**i**, Bridgoporus_nobilissimus*, and a number of species within the genus *Phaeocollybia*. I designed a simulation study that assessed the risk to rare species from fuels reduction and silvicultural activities assuming various distributions of the rare species for the Supplemental Environmental Impact Statement. Several years ago, I was involved in the design of a sampling approach for detecting 400 species of rare lichen, bryophytes and fungi for the Northwest Forest Planning area of 10 million hectares. This was a broad general survey to assess the rarity of these species across the target area.
- FS National Inventory and Monitoring Institute**:** I was a member of the Statistical Advisory Committee under the auspices of the FS Inventory and Monitoring Institute based in Ft. Collins, Colorado. The two largest projects were to advise the USFS in Montana and Idaho on creating an integrated series of ecosystem-based sample designs that is efficient and scientifically credible to assess the extent, condition, use and trends of Region's resources. We also advised USFS in California, on their monitoring plan in the Sierra Nevada. I was also on a 4 month detail as the Assistant Director of the Institute where my major project was to facilitate an agreement among USFS in California, Oregon and Washington, the Washington Office and FIA on a transition plan toward a national sampling and plot design.

Forest Service Northeast Research Station, Newtown Square, PA: 1989. I worked in the Research Technique Section of the Forest Inventory and Analysis Project. I conducted research in sampling techniques for estimating change between two forest surveys for variables such as growth, mortality, basal area, and number of trees that resulted in a research paper. I authored a publication for predicting the sampling errors of tabular data to reduce printing costs by eliminating the need to publish separate sampling error tables. Other duties included investigating potential bias in forest surveys by using a variable factor prism due to a failure to record all trees

Forest Land Use Planning (FLUP) project Niger, West Africa: 1985-1988. I was the biometrician at a US Agency for International Development funded project in Niger West Africa for three years. I started by analyzing previously collected data from an experimental forest and publishing the results in French and subsequently publishing a revised version in English. I later became the principle researcher for two large-scale projects. For the two research projects, I wrote the study designs, supervised the field data collection, and specimen preparation, analyzed the data and wrote the research reports under contract to AID. In the first study, I trained and supervised a five person crew in data collection techniques for tree stem diameter and weight within one hundred kilometers of the country's largest city. I also supervised the laboratory procedures and data collection on more than 1,000 cross-sectional disks cut from the tree stems. The study resulted in the first set of volume, weight, and growth equations that were every derived in the country for native species that was applicable across a sizable area (3,000,000+ ha). In the second study, I developed volume, weight, and growth equations for native species for a 45,000 ha forest which was the primary source of firewood for the country's second largest city. I developed a bilingual program (French/English) to process forest inventory data for a variety of sample designs. During my stay in the country, I trained a combination of Peace Corp Volunteers and host country nationals to conduct the first every forest inventories on 9 national forests totally 200,000 ha.

Education:

MS Forest Biometrics. University of Washington 1983.

BS Forest Management (*cum laude)*. University of Massachusetts 1974.

Publications: Available upon request

ABRIDGED VERSION OF CURRICULUM VITAE (APRIL 2011)
MTE NAFORMA

1. NAME: S.A.O. Chamshama

2. RANK/TITLE: Professor

3. DEPARTMENT/ADDRESS:

Department of Forest Biology
Faculty of Forestry & Nature Conservation
Sokoine University of Agriculture
P.O. Box 3010, Morogoro, Tanzania
E-mail: chamstz@yahoo.com, schams@suanet.ac.tz

4. TELEPHONE:

Mobile: +255 754 265654
Office: +255 2604494, 2604648, 2603511-4

5. PROFESSIONAL EXPERTISE:

My main area of specialization is plantation forestry. I have however been involved in research, training and consultancy in a wide range of areas including: natural forest management, agroforestry, tree improvement (mainly species and provenances), tree physiology, forest resource assessment, participatory forest management and climate change.

6. ONGOING RESEARCH ACTIVITIES

I am involved in the following ongoing research projects:

1. Title: Applied research in PFM: Assessing under what conditions PFM contributes to goals of poverty reduction, sustainable forest management and improved local governance.

   Overall objective: The overall objective is to determine the contribution of PFM to poverty reduction and forest condition as influenced by governance.

   Donor: DANIDA

   Duration: 2007-2011

2. Title: Participatory forest management for rural livelihoods, forest conservation and good governance in Tanzania.

   Overall objective: Contribute to experience and evidence based-based development of participatory forest management as a strategy for improved rural livelihoods, forest conservation and good governance in Tanzania.

   Donor: ENRECA

   Duration: 2008-2011

3. Development of biomass estimation models for carbon monitoring in selected vegetation types of Tanzania.

   Overall objective: Develop models and methods for assessing and monitoring carbon stocks in Tanzania required for implementation of REDD at local as well as national levels. The project aims to cover all major forest vegetation types (miombo woodland, montane forests, lowland forests and plantation forests).

   Donor: CCIAM/NORAD

   Duration: 2010-2013

7. CONSULTANCY SERVICE (International assignments in bold)

I have so far been involved in **44** consultancy assignments, and out of these **9** relate to project/programme evaluation and forest resource assessment. They are:

1. June - December 1988, - Forest management specialist, Tanzania Forestry Action Plan (INDUFOR-Finland/Govt. of Tanzania).
2. September 4 - 21, 1991, - Review of the NORAD funded catchment forestry project, Tanzania. (1988 - 1991) (NORAD, DSM).
3. October 13 - 30, 1992, - Review of NORAD funded SHISCAP - Shinyanga Soil Conservation and Afforestation Project (NORAD, DSM).
4. Oct. 17-28, 1994 & April 18-28, 1995, - Review of implementation of LAMP activities, Babati (ORGUT/Sida).
5. March 18 - April 15, 1996, - Review of Catchment forestry project II (1992 - 96) (FOREST DIVISION-TZ/NORAD).
6. **Sept 23-October 15, 2001- Mid term review of an IFAD funded and ICRAF implemented Indigenous fruit and medicinal trees project in Cameroon, Equatorial Guinea, Gabon and Nigeria (IFAD, Rome).**
7. **March 8-30, 2003- Completion evaluation of an IFAD funded and ICRAF implemented indigenous fruit and medicinal trees project in Cameroon, Equatorial Guinea, Gabon and Nigeria (IFAD, Rome).**
8. July 2004-April 2005. A study of social, economic and environmental impact of forest landscape restoration in Shinyanga region, Tanzania (Forest and Beekeeping Division, Ministry of Natural Resources and Tourism/ World Conservation Union (IUCN)).
9. June-October 2005. Lessons learnt on catchment afforestation component of Lake Victoria Environmental Management Project (LVEMP/World Bank).

8. PUBLICATIONS

I have so far published a total of **108** papers in proceedings and refereed journals. I have published in a wide range of areas. These include: germination techniques, nursery techniques, plantation establishment methods, forest soils, forest fertilization, tending methods, natural forest management, tree improvement (mainly species and provenances), tree phlysiology, agroforestry, forest resource assessment and participatory forest management. About **35** of these publications are on forest resource assessment aspects. The latest 10 publications are:

1. Mugasha, A. G., S.A.O. Chamshama & L. Nshubemuki. 2000. Effect of spacing on yield of *Sesbania sesban* , Gairo, Mrogoro, Tanzania. Tanzania Journal of Forestry and Nature Conservation 73: 53-62.
2. Maliondo, S.M.S., S.A.O.Chamshama, V.R. Nsolomo & M.L. Mhando. 2000. Early response of second rotation *P.patula* to nitrogen and phosphorus fertilizer at Sao Hill and Shume plantations-Tanzania. Proceedings of the first University wide Scientific Conference held at the Institute of Continuing education (ICE), SUA from 5th –7th April 2000. Pp 465-476.
3. Herbert, M., A.G. Mugasha & S.A.O. Chamshama. 2002. Evaluation of 19 provenances of *Calliandra calothyrsus* at Gairo and SUA Farm, Morogoro, Tanzania. Soutthern African Forestry Journal 194: 15 – 25.
4. Mwihomeke, S.T., A.G. Mugasha, S.A.O. Chamshama, M.A. Mgangamundo, O.C. Kumburu & Z. Lupala. 2002. Early performance of *Casuarina junghuhniana* provenances/land races at Lushoto, Tanzania. Soutthern African Forestry Journal 194: 7-14.
5. Chamshama, S.A.O., A.G. Mugasha, & E. Zahabu 2004. Stand biomass and volume estimation for miombo woodlands at Kitulangalo, Morogoro, Tanzania. Southern African Forestry Journal 200: 59-69.
6. Mwihomeke, S.T., P. Mwangingo, S.M.S. Maliondo, S. Mathias & S.A.O. Chamshama. 2004. Comparative performance of different *Casuarinas* species and provenance at Lushoto in the West Usambara mountains, Tanzania. Southern African Forestry Journal 200: 39-49.
7. Mugasha, A.G., S.A.O. Chamshama, K.I. Singo & M.A. Mgangamundo. 2005. Early performance of *Azadirachta indica* provenances at Mkundi and Chamwino, Tanzania. Journal of Tropical Forest Science 17(1): 45-62
8. Edward, E., S.A.O. Chamshama & A.G. Mugasha. 2006. Growth performance of lesser-known *Leucaena* species/provenances at Gairo inland plateau, Morogoro, Tanzania. Southern African Forestry Journal 208: 53-62.
9. Kajembe, G.C., Y.M. Ngaga, S.A.O. Chamshama & M.A. Njana. 2009. Performance of participatory forest management (PFM) regimes in Tanzania. Preliminary findings in the project " Applied research in PFM" pp. 93-110. In proceedings of the first participatory forest management (PFM) research workshop: Participatory forest management for improved forest quality, livelihood and forest governance. Tanzania Forestry Research Institute, Morogoro, Tanzania. 225pp.
10. Chamshama, S.A.O. and Vyamana, V.G. 2010. Forests and forestry in Tanzania. Pp. 89-108. In: F. Bongers and T. Tennigkeit (Eds). Degraded forests in Eastern Africa: management and restoration. Earthscan, UK. 370pp.

Mid-Term Evaluation of NAFORMA Tanzania
Curriculum Vitae

ANTTI ERKKILÄ

1.6.2011

Family name: Erkkilä
First names: Antti Olavi
Sex: Male
Place of birth: Huittinen, Finland
Date of Birth: 12 March 1956
Nationality: Finnish
Mother tongue: Finnish
Address: Kirkkkokatu 8 B 18, FIN-80110 Joensuu, FINLAND
Tel. Mobile: +358 41 5475592
Tel. Home: +358 13 224678
E-mail: antti.o.erkkila@gmail.com

1. Education:

Institution	**Degrees obtained**	**Date obtained**
University of Joensuu, Joensuu, Finland.	Doctor of Science in Forestry	18.12.2001
University of Joensuu, Joensuu, Finland.	Licenciate of Science in Forestry	26.5.1989
University of Helsinki, Helsinki, Finland	Master of Science in Forestry	10.10.1983

2. Membership of Professional Association:
- Society of Finnish Professional Foresters
- Finnish Society for Development Research

3. Other Training:
- Geographic Information Systems; Principles and Practices Course, University of Joensuu, Finland, 16.2.-27.2.1991.
- 8th Nordic Course on Forests and Forestry in Developing Countries, University of Helsinki, Finland, 25.2.-7.31980.

4. Countries of Work Experience: Finland, Kenia, Namibia

5. Languages:

	Read	**Write**	**Speak**
English	Good	Good	Good
Spanish	Good	Fair	Good
Swedish	Good	Good	Good
German	Good	Fair	Fair
Kiswahali	Poor	Poor	Poor
Finnish (native)			

6. Employment Record:
From: 2011 To: Present
Employer: Arbonaut Ltd., Joensuu, Finland
Position held: REDD+ Specialist

From: 2005 To: 2010
Employer: Ministry for Foreign Affairs of Finland
Position held: Counsellor (Forestry), Embassy of Finland, Nairobi, Kenya

From: 1997 To: 2005
Employer: University of Joensuu, Faculty of Forestry, Joensuu, Finland
Position held: Researcher, Coordinator for Global Sustainable Development

From: 1994 To: 1997
Employer: Ministry for Foreign Affairs of Finland
Position held: Forestry Advisor, Directorate of Forestry, Windhoek, Namibia

From: 1984 To: 1994
Employer: University of Joensuu, Faculty of Forestry, Joensuu, Finland
Position held: Researcher

7. Detailed Tasks Assigned

Name of assignment or project: REDD+ and Sustainable Forestry
Year: 2011- to date
Location: Joensuu, Finland
Client: Arbonaut Ltd.
Main project features: LiDAR-Assisted Multisource Programme (LAMP) for Forest Inventory
Position held: REDD+ Specialist

Activities performed:

1. Business opportunities in African agriculture/forestry sector 16 March 2011, Helsinki, Finland.
2. Launching Event: The State of Finland's Development Policy, 15 March 2011, Helsinki, Finland.
3. Coordinating the Expression of Interest, World Bank call for consulting services; Linking Community-based Forest Monitoring with National REDD+ Measurement, Reporting and Verifications Systems, February 2011.
4. Introductory course on airborne LiDAR (Light Detection And Ranging), an optical remote sensing technology used by Arbonaut Ltd.
5. Initiatives on forest governance monitoring: a field perspective from Kenya, a paper presented at the Second Expert Workshop on Monitoring Governance for REDD+, 18-19 November, 2010, Rome, Italy. UN-REDD and Chatham House.
6. Reframing Sustainability? Climate Change and North-South Dynamics, an international conference at the University of Helsinki, 10-11 February 2011, Helsinki, Finland. Co-author in the paper; *"Self-consistent carbon baseline in REDD+ Monitoring, Reporting and Verification"*.
7. Exploring the BoP: Sustainable User-driven Innovations at the Base of the Pyramid Market, an international workshop at the Aalto University School of Economics, 17-18 January 2011, Helsinki, Finland.

Name of assignment or project: Diplomat at the Embassy of Finland
Year: 2005-2010
Location: Nairobi, Kenya
Client: Ministry for Foreign Affairs of Finland
Main project features: Advisor on forestry and environmental issues
Position held: Counsellor (Forestry)

Activities performed:

1. Initiate and monitor the Kenya-Finland bilateral forestry programme (2007-2014, EUR 20 million).
2. Review local and regional development & research project proposals.
3. Initiate and support the East African Forest Law Enforcement and Governance & Trade (FLEGT) process.
4. Support local CDM and REDD-plus capacity.
5. Assist in multilateral issues related to UNEP and UN Habitat.
6. Chair the Forest Donor Coordination Group.
7. Observer at the 4th Policy Board meeting of the UN-REDD Programme, 17-19 March 2010, Nairobi, Kenya.
8. First Global Workshop on Improving Forestry Education, 25-27 September 2007, ICRAF campus, Nairobi.
9. Chatham House Illegal Logging Update and Stakeholder Consultation Number 10, 9-10 July 2007, London, UK.
10. United Nations Climate Change Conference, COP 12 and COP/MOP 2, 6-17 November 2006, Nairobi, Kenya. Party.
11. East African Consultative Forum on Forests, 14-15 September 2006, Arusha, Tanzania.
12. First National Participatory Forest Management (PFM) Conference, 6-8 June 2006, KEFRI/Muguga, Kenya.

Member of the PRESA International Advisory Group (IAG), 2008-2010. PRESA (Pro-poor Rewards from Environmental Services in Africa) is implemented by the World Agroforestry Centre (ICRAF).

Name of assignment or project: Strategic international partnerships on research & education
Year: 2002-2005
Location: Joensuu, Finland
Client: University of Joensuu
Main project features: Research, teaching
Position held: Coordinator for Global Sustainable Development

Activities performed:

1. Research on conflict timber; Angola-Namibia, Liberia.
2. Coordinate Global Forest Ethics Network; Editor of the Berlin conference proceedings "European forests and beyond: An ethical discourse" and "Forest ethics inspired by the Johannesburg summit 2002".
3. Initiate the UNEP - University of Joensuu partnership; Editor of "Proceedings of the First UNEP/University of Joensuu Symposium on Challenges to Sustainable Development".
4. Teach on and administer a course on Tropical Forestry.

Name of assignment or project: Indigenous Land Use Systems in Namibia
Year: 1997-2001
Location: Joensuu, Finland
Client: University of Joensuu / Academy of Finland
Main project features: Academic research
Position held: Researcher

Activities performed:

1. Doctoral dissertation, "Living on the land: change in forest cover in north-central Namibia 1943-1996" (published in 2001, Silva Carelica 37), dealing with the interaction between man and environment; and focusin on forest cover change, farming systems and the domestic use of wood in constructions on farms. Aerial photographs from 1996, 1992, 1970 and 1943, and satellite images from 1996, 1992 and 1981, amplified by ground truth data gathered in 1996, were used to monitor and analyse expansion of the settled area and its effects on forest cover. The study confirms that the forest cover has changed towards on-farm tree cover, and the species composition in agricultural fields has gradually changed towards trees producing edible fruits. A fairly high biocarbon landscape was still maintained and even enhanced, despite the deforestation processes.

   Other publications, including:

2. 1999. Forest cover change in the Ohangwena Region, northern Namibia: a case study based on multitemporal Landsat images and aerial photography. Southern African Forestry Journal 184: 25-32.
3. 1999. Relative calibration of multitemporal Landsat data for forest area change detection. Remote Sensing of Environment 68: 1-11.

Name of assignment or project: Institutional Strengthening of Namibian Forestry Sector
Year: 1994-1997
Location: Directorate of Forestry, Windhoek, Namibia
Client: Ministry for Foreign Affairs of Finland
Main project features: Forest Data and Information
Position held: Forestry Advisor

Activities performed:

1. Initiate forest information services for the Directorate of Forestry, including forest reference library and electronic networking facilities.
2. Establish pilot research projects, including tree species and provenance trials.
3. Support dissemination of forestry information by facilitating the production of forestry publications, slide series and video programmes.
4. Train Namibian counterparts.

Name of assignment or project: Forest and woodlands in the development of Namibia
Year: 1990-1992
Location: Joensuu, Finland (field work in Namibia)
Client: Ministry for Foreign Affairs of Finland
Main project features: Research
Position held: Researcher

Activities performed:

1. 1992. Forestry in Namibia 1850-1990. (The first comprehensive study on Namibian forestry; an interdisciplinary approach).

Name of assignment or project: Forest research
Year: 1984-1994
Location: Joensuu, Finland
Client: University of Joensuu
Main project features: Research
Position held: Researcher

1. Coordinate the Tropical Biology ERASMUS ICP Programme, a network of 12 European universities.

   Publications, including:
2. 1988. Tropiikin metsät (Tropical forests – first comprehensive publication on tropical forests in Finnish language).
3. 1985. Trooppisten sademetsien häviäminen Meksikossa (Deforestation of the tropical humid forests in Mexico).

Name of assignment or project: Short-term consultancies
Year: 1986-2011
Location: Finland, Kazakhstan, Lesotho, Malawi, Morocco, Namibia, Swaziland, Tanzania, Zambia
Clients: Ministry for Foreign Affairs of Finland, Indufor Oy, HUKS Ltd, University of Joensuu
Main project features: Research, project preparation and evaluation, advisory tasks
Position held: Consultant, Researcher

Activities performed:

1. Mid-Term Evaluation of National Forest Monitoring and Assessment of Tanzania (NAFORMA), Team member, May 2011.
2. Preparation of a minister visit from Kenya to Finland, May-June 2010.
3. Tender evaluation for the Ministry for Foreign Affairs of Finland, September 2010.
4. Development of forest research networking system (a report prepared for the Namibia-Finland Forestry Programme), 2002.
5. Fact finding mission to facilitate future EU-Kazahkstan cooperation (a TEMPUS TACIS programme), 2001.
6. Data collection and report writing for a pre-feasibility study on commercial plantation forestry in eastern Caprivi, Namibia, 1993.
7. Evaluation mission to Zambia with the aim of reviewing forestry and forest products related research over a 14 year period, 1990.
8. Supervisory mission for the FINNIDA Minor Field Study, The Village and the Environment of Bounaamane, Morocco, 1990.
9. Reconnaissance survey with the aim of preparing a fuelwood research project for SADCC dry zone and high altitude regions; Lesotho, Malawi, Swaziland, Zambia, 1986.