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FAO/GOVERNMENT COOPERATIVE PROGRAMME

Project of the Government of the Socialist Republic of Viet Nam

PROJECT DOCUMENT

Project No:	**GCP/GLO/194/MUL (FIN)**
Project Title:	Support to National Assessment and Long Term Monitoring of the Forest and Tree Resources in Viet Nam (NFA) Sub-project of FAO - Finland cooperation Programme; Sustainable Forest Management in a Changing Climate
Duration:	Three years
Estimated Starting Date:	March 2011
Government Executing Agency:	Ministry of Agriculture and Rural Development (MARD)
Project manager:	Vietnam Administration of Forestry (VNFOREST) -
Implementing agency:	Forest Inventory and Planning Institute (FIPI)
Project Site:	Hanoi, with activities in pilot provinces and all over the country
Total Inputs:	**US$ 3,252,800**
Government Inputs:	**VND 7,830,267,900** (**US$ 489,300)**
Donor:	Contribution: **US$ 2,763,500**

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Abbreviations and Acronyms

5MHRP	National Program for Reforestation of Five Million Hectares ("Five Million Hectare Reforestation Program")
AAC	Annual Allowable Cut
ADB	Asian Development Bank
ASEAN	Association of South East Asian Nations
CFIC	Centre for Forestry Information Consultancy
c.m.	Cubic meter
CoLIP:	Centre of Land Inventory and Planning
COP	Conference of the Parties
CTA	Chief Technical Adviser
DARD	Department of Agriculture and Rural Development
FAO	Food and Agriculture Organization of the United Nations
FCPF	Forest Carbon Partnership Facility
FD	Forestry Department
FDS	Forestry Development Strategy
FIPI	Forest Inventory and Planning Institute
FLITCH	Forest for Livelihood Improvement in the Central Highlands
FOMIS	Forest Management Information System
FORMIS	Forest Management Information System Project
FRA	Forest Resources Assessment
FREC	Forest Resources and Environment Centre
FSIV	Forest Science Institute of Viet Nam
FSSP	Forest Sector Support Programme
GCP	Government Cooperative Program
GFMP	General Forest Monitoring Program
GHP	Green House Gas
GIS	Geographic Information System
GoV	Government of Viet Nam
GSO	General Statistical Office
HQ	Headquarter
IPCC	Intergovernmental Panel on Climate Change
LiDAR	Light Detection and Ranging (Instrument)
MARD/VNFOREST	Ministry of Agriculture and Rural Development/ Vietnam Administration of Forestry
MONRE	Ministry of Natural Resources and Environment
MPI	Ministry of Planning and Investment
MRV	Monitoring, Reporting and Verification
NFA	National Forest Assessment (abbreviation of the Support to National Assessment and Long Term Monitoring of the Forest and Tree Resources Project)
NFAU	National Forest Assessment Unit
NFI –FIPI	FIPI National Programme of Inventory, Assessment and Monitoring
NFIMAP	National Forest Inventory and Monitoring Programme
NIAPP	National Institute for Agricultural Planning and Projection
NTFP	Non-Timber Forest Product
NTP RCC	National Target Programme to Respond to Climate Change
PMU	Project Management Unit
PSP	Permanent Sample Plot

SAR	Synthetic Aperture Radar
SFM	Sustainable Forest Management
TOF	Trees Outside Forests
TPR	Tri-Partite Review
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNFCCC	United Nations Framework Convention on Climate Change
UN REDD	UN Collaborative Programme on Reduced Emissions from Deforestation and Degradation in Developing Countries
VFU	Vietnam Forestry University
VND	Vietnamese Dong
VNFOREST	Vietnam Administration of Forestry

PART I – PROJECT AGREEMENT

1. Within the framework of its agreement with the FAO - Finland cooperation Programme; Sustainable Forest Management in a Changing Climate (the Donor) and upon request from the Government of the Socialist Republic of Viet Nam (the Government), the Food and Agriculture Organization of the United Nations (FAO) will supply assistance to support the execution of the following Project:

Project Title and Symbol:

Support to National Assessment and Long Term Monitoring of the Forest and Tree Resources, Viet Nam – GCP/GLO/194/MUL (FIN)

Estimated Costs:

Donor Government Contribution: **US$ 2,763,500**

Counterpart Contribution: **VND 7,830,267,900** (**US$ 489,300)**

Planned Duration: 3 years

A detailed description of the project design, including background, purpose, budget and work plan, is provided in Part II of the document.

FAO OBLIGATIONS:

1. FAO shall play a supporting role in the implementation of the project.

2. FAO shall be responsible for the recruitment, international travel, salaries and emoluments of the international staff and national experts. Procurement of both international staff and national experts shall be consulted and submitted to the Government for clearance. All international staff will work under the supervision of the National Project Director, who is responsible for the overall Project management.

3. FAO will arrange for supervisory travel visits to the Project, to be financed from project costs as shown in the Donor Government Budget.

4. FAO will introduce and assist in the application of the latest concepts and approaches, that are appropriate to national circumstances, to forestry resources assessment and monitoring and facilitate in building national capacity and strengthening institution.

5. All FAO obligations arising under this Project Document shall be subject to (i) the decisions of its governing bodies and to its constitutional, financial and budgetary provisions, and (ii) the receipt of the necessary contribution from the Donor Government. Any obligations assumed by FAO may, at any time, be taken over by the Donor Government.

GOVERNMENT OBLIGATIONS

7. The Government shall have the overall coordinating role, including the training of national personnel and the design, planning and implementation of the forest assessment project. The responsible national institution designated by the Government will act to reinforce the structure and develop national capacity for forestry resources inventory and assessment and information management at the national and regional levels

8. The Government shall take all necessary measures to facilitate the execution of the Project and to assist the international staff in obtaining such services and facilities they may require to fulfil their tasks. The Government shall apply to FAO, its property, funds and assets, its officials and to the persons performing services on its behalf, in connection with the Project, the provisions of the Convention on Privileges and Immunities of the Specialized Agencies, and the currency exchange rate established with the United Nations.

9. The Government shall deal with any claims brought by third parties against FAO, its personnel or other persons performing services on its behalf in connection with the Project, except when it is agreed by FAO and the Government that such claims arise from gross negligence or wilful misconduct of such persons.

10. The Government shall be responsible for the recruitment, salaries and social security measures of the national personnel and will appoint a National Project Director and a National Project Coordinator. The Government shall provide the facilities and supplies for the Project, as agreed in the Project Documents.

11. The Government shall grant to the staff of FAO and of the Donor Government and to persons acting on their behalf, access to the project sites and to any material or documentation relating to the Project and shall provide any relevant information to such staff or persons.

12. The Government is responsible for the cost of import and customs clearance of project equipment, its transportation, handling, storage and related expenses within the country; its safe custody, maintenance, insurance and replacement, if necessary, after delivery to the project sites.

REPORTING

13. The Government will report on the Project to the Donor and to FAO as detailed in Part II of this document.

14. The Government shall agree to the dissemination of information like descriptions of the Project and of its objectives and results, for the purpose of educating the public, appropriate to national regulations and relevant international agreements that Vietnam has a signatory.

AMENDMENTS AND TERMINATION

15. This Project Document may be amended or terminated by mutual consent. Termination shall take effect sixty days after receipt by either party of written notice from the other party. In the event of termination, the obligation already assumed by the Government shall remain in force to the extent necessary to permit orderly withdrawal of the FAO personnel performing services on its behalf as well as of funds and assets if any.

16. This Project Document shall enter into force upon signature by both parties.

PART II: PROJECT DESIGN

I. EXECUTIVE SUMMARY

The NFA project in Viet Nam is part of global FAO - Finland Sustainable Forest Management in a Changing Climate Programme, which intends to build capacity, test and develop methodologies and deliver good practices and methods at the national level. The FAO – Finland Programme is be based on FAO's core competence in supporting member countries in establishing forest assessment and monitoring systems (NFMA), in developing and implementing of National Forest Programmes and in deriving and implementing good practices guidelines on forest management. This project document includes only the forest inventory related activities and during later stages potential for the Outcomes Areas 2 – 4 will be studied and planned with additional funding in cooperation with the Vietnamese counterparts and linked to the overall Programme and the NFA project document.

Viet Nam has had a National Forest Inventory, Monitoring and Assessment Program (NFIMAP) underway since 1991. Three cycles of field surveys were implemented for the periods of 1990-1995, 1996-2000 and 2001-05. The forth round for the period of 2006-2010 is ongoing. NFIMAP has the potential to become a pioneer in the region, the source of undisputable information of the full range of benefits (goods and services) and the driver of the national decision making on a variety of issues. This can be achieved if it is conceptually and technologically modernised, its concept and objectives improved, the quality and scope of the generated knowledge widened to address cross-cutting issues and all users' needs.

The NFA project is intended to improve the concept and the objectives of NFIMAP as well as the quality and scope of information with particular emphasis on monitoring the dynamic of changes in the land use system and REDD+ and serving the needs of GHG reporting. It is also planned to enhance the capacity of the organisations and institutions that are planning and implementing inventories and to introduce new and appropriate technologies.

NFA will be closely linked with the Forest Management Information System Project (FORMIS) and the National Forest Inventory and Monitoring Programme (NFIMAP) planned for 2011-2015, for which NFA will provide support especially in planning and testing methodology. The project will work closely with inventory and REDD+ related initiatives e.g. UNFCCC, the Intergovernmental Panel on Climate Change (IPCC), FLITCH, UN REDD Programme and Forest Carbon Partnership Facility (FCPF), bilateral donors and NGOs.

Building on this national experience and considering the international developments in the area of forestry, this project will assist the Government of the Socialist Republic of Viet Nam to:

1. Strengthen institutional capacity of Vietnam Administration of Forestry (VNFOREST), Ministry of Agriculture and Rural Development (MARD), focusing on Forest Inventory and Planning Institute (FIPI) and other implementing institutions;
2. Harmonise and update the information on forests and trees and related use and users;
3. Consolidate the monitoring system of the resources; and
4. Provide information for the review the forestry sector policy in the light of the results from the forest resources assessment.

The main objective of the NFA is to assist MARD /VNFOREST in the development of the National Forest Inventory and Monitoring Programme (NFIMAP).

The outcomes of the project are as follows:

1. Established broad consensus at the national level on the needs and approach to NFIMAP in Viet Nam by taking into account national users' requirements and country's obligations to reporting to international processes, including REDD+;
2. Capacity of VNFOREST and FIPI strengthened to collect, analyse and disseminate information on forest resources, users and uses;
3. Prepared bases to develop national forest and land use maps at levels and scales based on harmonised classification of forest and land uses and related definitions that serves also REDD+ monitoring and the development of the national Forest Management Information System (FOMIS);
4. National assessment of the forest and trees outside forest resources operational.
5. Framework established for a long term monitoring of the forestry resources.

NFA will support establishing the framework for GHG reporting and REDD+ monitoring. The assistance constitutes technical advisers in designing of the inventory, assisting in defining data needs, forest assessment, mapping, data analysis, information management, use of information for policy analysis, equipment for forest inventory, database/information system development, mapping, developing local and national governance systems, training and part of operating expenses.

The NFA/NFIMAP will be implemented through a participatory process including all key stakeholders from data providers to end users of the information to establish a national consensus on the approach, the land use classification system and the thematic scope of the NFA. Technical procedures of the NFA will be reviewed during the inception phase of the programme.

Viet Nam will have undisputable information on all benefits from forests and trees, and related socio-economic data, which will be used to support the processes of decision making and will contribute to the social and economic development of the country as well as to the protection of the environment.

Donor contribution for the project is USD 2,763,500 and the contribution of the Government of Viet Nam is VND7,830,267,900 (USD 489,300).

II. BACKGROUND AND JUSTIFICATION

1. Geography

Viet Nam is located on the eastern part of the Indochina Peninsula, in the centre of South East Asia. The country is bounded on the northern side by China, the western side by Lao and Cambodia, and the eastern and southern sides by the East Viet Nam Sea. The total surface area of the country is 33.1 million hectares. Of this total surface area, 39.1% is forested area (i.e. 31.2% natural forest and 0.9% plantation forest), 19.3% bare land and 42.4% comprises other land (MARD, 2009).

2. Population and its Influence on the Forestry Sector

The national population of Viet Nam has increased from 66 million in 1990 to 86 million in 2009 (GSO, 2010) i.e. growth rate of 1.4% (1.0 million/year). In 2009, the population density of the Vietnam was 259 people per square kilometre and was the third highest in South East Asia (after Indonesia and the Philippine), reaching up to 960 people per square kilometer in the Red River Delta.

Figure 1: Map of Viet Nam

More than 70% of the population live in rural areas. Of this, 65% practice agriculture and forestry, thus living with fields and forests. The number of people in upland provinces is increasing because of normal population growth and the steady influx of lowland migrants. However, high population growth places increasing pressure on the mountainous areas, leading to progressive forest degradation and deforestation. This rapid population growth rate puts a heavy burden on the economy, particularly with respect to social challenges such as stabilising and enhancing the living and educational standards of people and providing employment opportunities to local people (currently suffering from either full time or part time unemployment) living below the poverty line. These communities depend on forest goods and services and land gained from the forests. Deforestation is especially widespread in the central highland where a growing rural population remains heavily dependent on forests for subsistence. Concurrently, the demand for industrial wood is increasing. This situation continues to cause pronounced social and economic strains on public health, education and employment in particular. The increasing scarcity of wood from natural forests, the high demand of timber which consumption reached 10 million m^3 in 2003, fuelwood consumption estimated at 25 million m^3 in 2003 (see box 1) and escalating prices have encouraged the accelerated establishment of forest plantations in areas having economically viable access to markets. It is generally recognized that increased development of planted forests and scattered trees is the only option for supplying the increasing volumes of wood that will be needed in the future. This is especially true for high-value wood used in making furniture that is currently obtained from diminishing natural forests.

3. Forest Resources and a Changing Forest Cover

Forty-eight percent, or 16.2 million hectares, of the 33.1 million hectares of the total land area of Viet Nam is classified as forest land (forested and non-forested) under the administration of the MARD. The area of actual forest cover (forested) declined from 14 million hectares in 1943 (42 percent of the land area) to 9.3 million hectares in 1990 (28 percent), with the lowest per capita area of forested land in Southeast Asia, just 0.12 hectare. This compared with an average of 0.42 hectare per capita in countries of the Association of South East Asian Nations (ASEAN) overall, and the world average of 0.6 hectare per capita. In 2009, of the 12.89 million hectares of the actual forest area, 10.34 million hectares were natural forests and 2.9 million hectares were planted forests which are comprised primarily of a range of tree species such as *Pinus*, *Eucalyptus* and *Acacia* genera. A further 3.34 million hectares were classified as forest land with little or no forest cover. Old growth natural forest occurred only on 6 percent of the land area. In general, the country's forests had been transformed into degraded, poorly stocked forests with relatively low economic value.

Deforestation, caused by a combination of excessive logging, unlawful cutting of logs and fuelwood, shifting cultivation, warfare (especially herbicide spraying), and forest clearing for rubber, coffee and other crops, has been occurring since the 1960s. Estimates indicate that deforestation occurs at a rate between 100,000 and 200,000 hectares per annum during the last decades and was most serious in mountainous provinces. The broad impacts of forest losses have been a huge reduction in industrial and domestic wood supplies (especially large logs), forest cover and soil which is critical in watersheds thus contributing to more frequent and intensive flooding, and loss of rich biological diversity.

In the recognition of the negative consequences of forest resources depletion, the National Assembly held in December 1997 approved the Five Million Hectors Reforestation Programme (5MHRP) as one of the three top priority economic programmes of the Government during the period 1998-2010. This aims to enhance wood-supply capacity in the country, to increase forest cover in watershed areas, preventing soil erosion and also better regulating water flows, and to rehabilitate habitats for wildlife. This trend appears to be a result of expansion of natural forest and the rapid increase in plantation forests.

4. The Forest Sector Benefiting from New Policy Measures

Great strides have been made in the national economy over the last decades, benefiting from great momentum gained in the economic development in the South East Asia region. National records indicate that the forest sector, coupled with sound policy measures that have been put in place, has contributed significantly to the socio-economic development of the country. The extent of policy influences on the state of forestry resources, the way these resources are managed and used and how they interact with other sectors within the national economic environment, however, require periodic updates of sound information. The role of the forestry sector can also be greatly enhanced if productivity is significantly improved through solid environmental protection. This analysis calls for long-term resource monitoring based on agreed methodologies and approaches in order to facilitate informed policy formulation developments with respect to the extent, quality and changes of the resources.

Forest resources are vital assets in terms of environment protection, wildlife habitat, livelihood of the rural population, and economic development. A national reforestation programme of about five million hectare, started in 1998 and envisaged to end in 2010, is further expected to improve and enhance this role in the economy. The potential for resource degradation and land use conflict is still threatening though, particularly in provinces with high percentage of forest cover and where there is greater pressure on cultivation land. Since 1945, forest cover has undergone severe changes and natural forest cover has shrunken with the peak period of transformation of the forests to other land uses between 1980 and 1985 and a deforestation rate of 235 000 hectares/annum. Following this period, the deforestation rate slowed down to an estimated 36 000 hectares/annum between 1990 and 1995. The national statistics indicate that this trend seems to have been reverted between 1995 and 1999 and the national forest cover estimates showed a positive annual change of 298 000 hectares (FDS, 2001). Nevertheless, the degradation in

natural forests has remained a serious concern due to overexploitation and loss of biodiversity (fauna and flora), and valuable ecosystem deformation, which lead to risks of soil erosion, flooding, etc.

The overall objective of the state forestry sector, which guides planning and projects, is outlined in the Forestry Development Strategy for the period 2006-2020. It is to: "establish, manage, protect and utilize in a sustainable way 16.24 million hectares of forest and forest land use; increase the forest cover up to 40.8% in 2010 and 43.5% in 2020; ensure the participation of many economic sectors and social organizations in forest development to contribute to the socio-economic development` environment/biodiversity protection, supply of environment services, poverty alleviation, improving living condition of the mountain rural people and contribute to national security."

5. Information Base for Decision-Making

The view that natural forest area has changed positively at the reported magnitude over the past few years is difficult to substantiate because there is no stable national legend and classification system in the country to yield comparable information. Added to this, lack of a systematic approach between successive reporting and national standards has generated differences in figures on forest and land uses. Changing classifications and definitions between and within national institutions (e.g. CoLIP, National Institute for Agricultural Planning and Projection [NIAPP] and FIPI) is the major source of inconsistencies in national data. Furthermore, the current national legend used for national reporting does not fully meet the international reporting requirements such as criteria and indicators for sustainable forest management. This means that the country's obligation to report to international processes is not facilitated.

The lack of collaboration between various national mapping agencies has led to a lack of a national standard and hence a lack of a harmonised mapping approach and sector integration. The major outstanding problems are lack of integration and coordination between and within different sectors and mapping institutions, lack of systematic approach to update the information within FIPI, lack of harmonisation with ongoing regional and international processes, inadequate capacity and capacity building for mapping programme and no clear data management and data sharing policy among information providers and users.

6. Need for Improved Monitoring System

FIPI is the leading national institution in resources assessments and monitoring in Viet Nam. FIPI has used different methods and techniques to collect and analyse data. Over the last decade and half, the government deployed, through FIPI, extensive efforts to collect data on forest resources. A system has been put in place to generate information and knowledge about the national resources for the aim of supporting the policy processes. A network of 4,000 permanent sample plots (PSP) has been established in forest areas following a grid developed for the purpose and the number of measured sample plots has been changed from the cycles. The interval between the plots varies depending on which direction one goes. The plots are located in tracts of one kilometre square. The configuration of plots shows two perpendicular strips of 500m x 20m starting in the centre of the tract. The sampling design seems to have some limitations and weaknesses in statistical and cost points of view. Data collected in the plots are more focussed on timber. Some other forest properties are also assessed. Three cycles (1090-1995, 1996-2000 and 2001-2005) of field data collection have already been completed and the fourth (2006-2010) is under way. However, no study is carried to analyze whether the number of the sample plots and its design are scientifically and economically suitable or not. Trees outside forests are not covered by the FIPI programme of inventory, assessment and monitoring.

The NFA project has the potential to become the undisputable source of information of the full range of benefits (goods and services) of all types of forests and trees outside forests and the driver of the national decision making. This can be achieved if it is conceptually and technologically modernised, its concept and objectives improved, the quality and scope of the generated knowledge widened to address cross-cutting issues and all users' needs. It may even serve as a successful example to other countries in the region. In addition to the biophysical and socio-economic variables already covered, the NFA of Viet Nam should place particular emphasis on the monitoring of the dynamic of change of the land use

systems (incl. REDD+ monitoring), on the tree resources outside forests as well as on building capacity of the FIPI as implementing agency.

UNFCCC COP-13 in Bali, Indonesia in 2007 adopted a decision on reducing emissions from deforestation in developing countries (REDD): approaches to stimulate action and requested advancing the development of methodological approaches to estimate consistently over time the changes of emissions from deforestation and forest degradation in developing countries in demonstrable, transparent, and verifiable manners. COP-14 in Poznan, Poland in 2009, the concept of REDD+ was introduced by adding the role of conservation, sustainable management of forests and enhancement of forest carbon stock). So far the requirements for the monitoring systems have not been decided and therefore the countries should concentrate in developing their readiness in systems and capacity to monitoring and verification of REDD+ and GHG emissions reporting. This requires more precise results on carbon stocks and changes in the stock with reference to IPCC guidelines and upcoming additional guidance from SBSTA. Improvement can be obtained with intensified use of remote sensing (RS) and inclusion of all carbon pools to the NFA. Additionally, the inventory and monitoring system should produce data about the implementation of the National REDD+ Program. The ultimate aim is to facilitate Vietnam to be ready entering into the REDD+ implementation and/or a possible new Post Kyoto agreement.

The environment for NFA is changing very rapidly in Viet Nam; National Target Programme to Respond to Climate Change was approved by the Prime Minister in December 2008. A National REDD+ Program is under preparation. The Office of the Prime Minister has issued an official letter to order the MARD/VNFOREST and the Ministry of Natural Resources and Environment (MONRE) to prepare for a joint GFMP/NFIMAP which will be implemented from 2011-2015 to make sure that two Ministries have a common forest data sets. The Program will consist of three components: i) forest inventory and mapping, ii) demarcation of forest area and quantification of forest quality under management of every forest owner and manager and, iii) establishment of forest management dossiers for different administrative levels. The first component will be done by central agencies, the second and third ones will be responsible by local authorities with technical assistance from technical institutions. The planning phase of this Project is currently going on. FIPI will be the leading technical agency to support VNFOREST and provincial authorities to implement the NFIMAP/GFMP in collaboration with other MARD agencies. The NFA project is designed to support the implementation of the above-mentioned program and needs taking into account the demands set for a scalable forest inventory and monitoring methodology, which can feed information for various end-users at different levels.

The major constraint in this Project is lack of capacity and especially in data processing and analysis with respect to qualified personnel, computer hardware and software utilities. This is evidenced by most of the raw field data from the national forest inventory cycles 1, 2, 3 and 4 which were undertaken by FIPI but not processed by the end of December 2010, so that the data usefulness and limitations are not explored Capacity of the national institution for forest resource assessment, although significantly strengthened during the past decade, still requires a great deal of support in order to refine and align national forest resource assessment with new concepts and technologies and with information requirement at the national, regional and international levels. This suggests that country efforts need to be made to link forestry data collection with ongoing regional and international processes both with respect to scope and specification of information. To achieve this objective, there is an urgent need to:

1. further train national personnel in order to accompany new developments in the areas of resources assessment and information management;
2. enhance the capacity of FIPI and other NFA related institutions in the area of data processing and information management;
3. unify the assessment approach at national level for consistency of information from successive surveys and for ease of reporting to international processes;
4. expand the national forest assessment to cover the tree resources outside forest boundaries and monitor the changes of the land uses incl. needs for REDD monitoring reporting and verification
5. streamline resources monitoring and information management.

The current economic transition in Viet Nam requires more appropriate approaches that aim at optimising the use of the collected information and overcoming the shortcomings in resources assessment and continuous monitoring. The current approach to forest and tree resources assessment that is being followed is not adequate to satisfy the needs of information required for sustainable forest management and to improve the present national forest development policy and strategies, particularly with respect to food security and poverty reduction. Formulating a new relevant approach for collection of field data, analysis of information, management and dissemination and implementation of national forest development policy and strategy is a big challenge. Learning the progress and adjusting it to the particular situation of Viet Nam has been imperative not only in the development of forest policy and strategies taking in to consideration the socio-economic concerns.

7. Linkage to the global FAO - Finland Sustainable Forest Management in a Changing Climate Programme.

The NFA project is part of FAO - Finland Sustainable Forest Management in a Changing Climate Programme. This project document includes only the Outcome area 1 activities and during later stages potential for the outcomes areas 2-4 will be studied and planned with additional funding in cooperation with the Vietnamese counterparts and linked to the overall Programme and the NFA project document.

The FAO - Finland Programme intends to build capacity, test and develop methodologies and deliver good practices and methods at the national level. The Programme will be based on FAO's core competence in supporting member countries in establishing forest assessment and monitoring systems (NFMA), in developing and implementing of National Forest Programmes and in deriving and implementing good practices guidelines on forest management. The Programme will seek to improve sustainable forest management and to achieve the four Global Objectives on Forests agreed by the UNFF through implementation of the non-legally binding instrument on forests (NLBI) and to mainstream forestry within efforts to eradicate extreme poverty and hunger, achieve sustainable land use, mitigate and adapt climate change and to help to achieve Millennium Development Goals – in particular goals 7, 1 and 3.

The expected Programme impact is to enhance the ecological, social and economic sustainability of forests and tree resources and increase their benefits for rural livelihoods and their role in mitigating of, and adaptation to, Climate Change. The outcomes of the programme are as follows:

Outcome 1: Policy and practice affecting forests and forestry are based on timely and reliable national forest monitoring and assessment (NFMA) information for national and international reporting

Outcome 2: National forest programmes (NFPs) serve as an effective mechanism for integrating forestry into national development plans and processes, including for climate change and considering links between forestry, other land-uses and livelihood benefits

Outcome 3: Sustainable forest management (SFM) more widely practiced, including through the application of Good Practices Guidelines, meeting the climate change adaptation needs and leading to reduction in deforestation and forest degradation

Outcome 4: Countries' capabilities enhanced to meet their international forest related commitments and negotiations

The Programme will include 3 - 5 countries and there will be 2-3 countries reserved on a short list. Multi-disciplinary teams of specialists in NFMA, NFP and SFM will mount missions to potential participating

countries to prepare country project documents that detail work plans and budgets that will form the basis of final national outcomes, outputs, activities and inputs of the Programme.

A guiding principle of the Programme is to build capacity and ownership in designated developing countries through holistic approaches combining key services of FAO to develop tools to promote and implement sustainable forest management. The emphasis of the Programme is to provide improved information about forest resources; to feed this information into the planning policy and planning processes; and finally to effectively implement policies and plans in practical management of forests and trees outside forests.

Expert resources both in the HQ and in the countries will be targeted for development of methods and systems, and piloting them in the Programme partner countries. The anticipated expertise (to be confirmed during inception) includes Programme Coordination, Database Management and Statistics, Forest Inventory and Remote Sensing and Forest Management. Outsourcing or partnership arrangements with other organizations, institutions, or private service providers will be undertaken in selected specialist fields such as testing new remote sensing technologies for forest monitoring. Special efforts will be made to strengthen linkages with Finnish organizations, universities and research institutions with respect to the development of methodologies. FAO (Forestry Department) will manage and coordinate Programme resources and have overall responsibility for the Programme.

8. New National Forest Assessment Building on National and International Experiences

In designing the NFA approach, careful considerations will be made with respect to stakeholders participation from the beginning of the project, cost effectiveness, complexity/rapidity of data collection and update procedures, accuracy and consistency of output data (in space and time), comparability of outputs with those from other systems of data collection and flexibility in land use classification/characterization, e.g. adaptability to changes in scale and level of generalization; capacity to rapidly facilitate a broad range of analysis in response to various decision making needs from national to sub-national level.

Important will be to keep the link open to potential other FAO Finland Programme outcomes areas (2-4), especially in National Forest Programme approach supporting the collection of quality forest resources data on which to base policy decisions in forestry, deriving and implementing good practices guidelines on forest management and linkages to international processes.

Building on national experiences and institutional frameworks, the model approach of FAO for forestry resources assessment and long term monitoring that has the potential of responding to different national needs will be reviewed and adapted to Viet Nam's information needs and requirements. In order to avoid duplication of efforts and ensure comparability of new information with historical database, the NFA approach should build, to the possible extent, on the existing methodologies and techniques being followed for the national forest inventory in Viet Nam. For easy reference, readers may consult the NFA programme at the FAO website: (http://www.fao.org/forestry/site/24672/en). In summary, the FAO approach aims at:

- Assessing the forest and trees outside forest (TOF) resources for national level decision making**:**
  - State of resources (areas, volume, biomass, biodiversity, etc);
  - Non wood forest and tree products and services;
  - Management, use and users of resources;
  - Role of forests and trees in food security;
- Setting up a long term monitoring system of resources incl. C-monitoring and REDD+;
- Developing/strengthening national capacity for forest and TOF resources assessments, information management and long term monitoring;
- Contributing to increasing awareness of the multiple functions of forests and trees;

- Developing harmonized land use classification & terms and definitions with International reporting systems;
- Forging partnerships between national institutions and with regional and international agencies;
- Guiding investment and socio-economic development programmes in the country;
- Facilitating country reporting to international processes.

Usually, information requirements differ greatly between providers and users. It is therefore critical to understand forest development policy and strategy information requirements and reach consensus on priorities before initiating any data collection process. Failure to do so may lead to information providers supplying irrelevant or outdated information to policy makers. Also, information providers may realize that the information acquired was of little or no use in spite of huge costs being spent on data collection and processing. Contrary to this phenomenon, providers of information may discover that the information they supplied was used for a different purpose other than what it was intended for. This may ultimately prove to be a disincentive. To resolve these issues, the process of data collection should be preceded by a need analysis phase in order to understand what information is needed, for what purpose, when and who needs it, prioritise the needs and develop methodology to gather such information. Data collection processes should ensure that collected data can answer broad questions relating to policy formulation and review. Thus, all these questions need to be addressed clearly because they form the fundamental principles to the formulation of national forest development policies and strategies, not only in Viet Nam but worldwide.

A participatory approach with policy makers, producers of information and relevant partners in forestry or related matters is the most effective method to collect information to achieve this objective. The advantage is that users of information are provided with an opportunity to influence the content and format of the database by providing opinions and recommendations. The process also provides an opportunity for coordinating data collection processes with other institutions, encourage sharing of information, avoid duplication of efforts in collecting information and minimize costs. It further provides a platform to synthesize all opinions and information needs, thus enhancing capacity to formulate, review and improve relevant policies.

II. FOREST SECTOR STRATEGY FOR THE PERIOD 2006-2020

Objectives and orientations of the Forestry Development Strategy will be implemented via the following programmes:

Three Development Programmes

1. Sustainable Forest Management and Development Programme
2. Forest Protection, Biodiversity Conservation and Environment Development Services
3. Forest Product Processing and Marketing Programme

Two Support Programmes

1. Research, education, training and extension programme
2. Improving mechanism, policy, planning and Supervision of the Forestry Sector

Planning, Monitoring and Evaluation

- Carry out statistics and inventory of forest resources; Establish forest resources database and its M&E system with modernized technology; Apply new technique to improvement of forest inventory system of Viet Nam.

Sustainable Forest Management:

- Establish stable national forest stands for the three forest categories, construction of forest type maps. Sustainable and effective management the area of production forest: 3.63 million ha of

natural forest and 2.95 million ha of plantations of which 2.5 million ha are assigned for timber production and 0.45 million ha. for production of non-timber forest products (NTFP).

Forest Protection, Biodiversity Conservation and Development of Environment Services

- Forest protection and biodiversity conservation.
- Active participation of local community.
- Strengthen the contribution of environment services.

Allocation of Land Use Rights to Individuals and Households

- Complete the forest land allocation and renting to the economic sectors before 2010, prioritizing allocation of protection forests to communities, cooperatives and households for management, protection and long term benefiting on the basis of multipurpose forest establishment and sustainable forest management.

III. NATIONAL SOCIO-ECONOMIC DEVELOPMENT PLAN (2006-2020)

The Government recognises that the baseline surveys of natural resources have not been comprehensively conducted, their effectiveness is low, irresponsive to the needs of information and statistics; old data remain unsupplemented, un-updated or verified. Statistics management is not good enough. Data are insufficient and imprecise.

An important role was assigned to forestry in the socio-economic development of the country. It is expected that agriculture, forestry and fisheries will grow by 3 to 3.2% during the period of 2006 and 2010. In the general goals, main tasks and targets, the product of the sector of agriculture, forestry and fisheries in the GDP will be about 15-16%. It is expected that forest coverage will be about 43-44% of the total forest areas.

The main orientations of the Government for the forestry sub-sector are:

- Knowledge development of the state and changes of the forestry resources
- Develop information base and management
- Improve contribution of the forests in the national economy;
- Properly protect natural forests and protection forests
- Expand planed forests and;
- Complete allocation of forest to people.

IV. INSTITUTIONAL FRAMEWORK FOR THE SUB-SECTOR

1. VNFOREST/Ministry of Agriculture and Rural Development (VNFOREST/MARD)

The VNFOREST/MARD is just established in January in 2010 to include the Department of Forestry (DoF), Forest Protection Department (FPD) and Forest Inventory and Planning Institute (FIPI). VNFOREST is the primary agency of the Government for the forestry sector administration, management and development. It comprises numerous departments having responsibility for policy, forest management, forest protection and conservation, science-technology, product quality, extension, education and international cooperation. Inter-provincial national parks, the Forest Science Institute of Viet Nam (FSIV), and the Vietnam Forestry University (FUV) at Xuan Mai operate under the authority of MARD. State-owned forest companies and forest management boards are under management of provincial authorities. Donor-assisted forestry development projects having large loan and credit components are coordinated and managed by a Management Board for Forestry Foreign Aid Projects.

With regard to the forestry sector and natural resources, MARD/VNFOREST has administrative linkages with other institutions such as:The Ministry of Natural Resources and Environment (MONRE) which was established in November 2002 focuses mainly on the allocation of lowland agricultural areas and the establishment of detailed cadastral maps (scale 1:1,000-1:2,000) for these areas and controls the Land

Department, and the Land Registration and Statistics Department. This Ministry is also in-charge of all State lands including forest lands.

2. Forest Inventory and Planning Institute (FIPI)

FIPI is an institute under VNFOREST. It has 6 regional branch offices (Sub-FIPI), Forest Resources and Environment Centre (FREC) and Centre for Forestry Consultancy and Information (CFIC), which are in charge of the field level activities within their territorial responsibility. FIPI is a key agency to be responsible for the assessment of forest resources. FIPI has developed a national forest classification system based on timber volume and crown cover and has experiences and capacities for visual land use interpretation and digital classification of remote sensing images, digitisation of interpreted results and preparation of maps. This is done by the FREC and the CFIC, both Centres have a Remote Sensing Section. These sections arein charge of the establishment of forest type maps at various scales based on interpretation of satellite images and aerial photographs. The Remote Sensing Sections disposes of limited computer hardware installations which allow for computerised data analysis, map design and printing and other GIS functions. Available software includes old versions of MapInfo, ArcView, MicroStation, ERDAS Imagine and ILWIS. FIPI also has an archive of maps, aerial photographs and digital map data.

National forest resource inventories at small scales have been carried out by FIPI on several occasions. FIPI has implemented a national programme called the Forest Inventory, Assessment and Monitoring, under which it has so far completed three cycles (90-95, 96-2000, 2001-2005) and the fourth (2006-2010) is completed very soon. Forest cover maps in 1990, 1995, 2000, 2005 and 2010 are digitized under support of JICA and the Finnish Embassy, forest cover maps for 1990, 2000 and 2010 are validated with support from JICA. In addition, FIPI also has digital topographical map files 1:50,000 and 1:100,000 of the UTM and national VN-2000 map projections.

FIPI offers services related to forest inventories, land use planning, mapping, map digitisation, image interpretation and field checking on a contractual basis and has experience in carrying out small scale as well as detailed resource inventories.

3. Provincial Forestry and Agriculture Administration

All provincial governments have Departments of Agriculture and Rural Development (DARD) which have operational responsibility for forest management, protection and development functions within the province and report to the provincial government on administrative, technical and financial matters. Provincial departments direct and control forest operations in districts and communes. A feature of many provincial administrations is limited technical capacity for project management. It is therefore desirable that training and education activities that will improve the technical and managerial capacity of provincial forest management are included within the project design.

4. District Forestry and Agriculture Administration

Within each province, a number of districts have responsibility for implementing government policies. Districts are led by a District People's Committee and, increasingly, have good road, telephone, postal and electricity services and are able to provide technical extension assistance to farmers in both forestry and agriculture.

V. PROBLEMS TO ADDRESS AND PROPOSED SOLUTIONS

The success of forestry development and its impact on the environment in general and on the well being of people depends largely on the extent of knowledge of the state and trends in the availability of resources. Knowledge can only be developed and maintained up-to-date if the country invests in it through establishing an adequate monitoring system. This requires institutional strengthening, periodic

data collection and analysis, information management and dissemination. The Project will address the following challenges at two levels:

1. Institutional Strengthening

VNFOREST is now planning to centralize the forestry resources assessment and data compilation. It means that FIPI and other VNFOREST's departments are requested to share data sources. This has created some inconsistencies in national information on the resources. The streamlining of the forest assessment programme is a condition for unified national datasets and a national focus for lasting monitoring. Under this project, VNFOREST will be reinforced to fully play their function as main national institutions in charge of resource assessment, updating and information management. Its capacity will be reinforced and strengthened at the national and regional levels to function properly according its mandate. A national database on forest and trees will be developed and located in VNFOREST and personnel at national and provincial levels will be adequately trained.

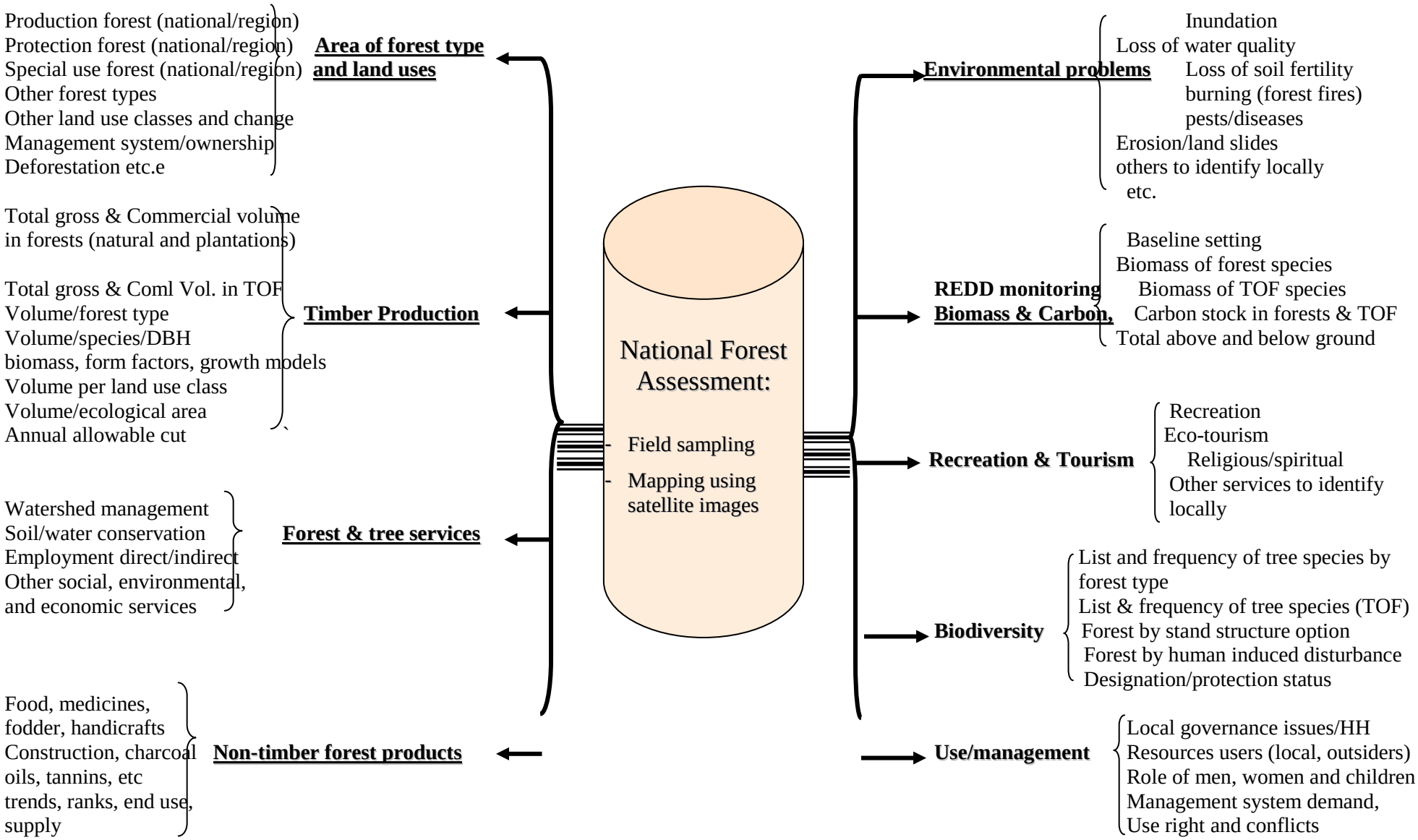
Implementation of Forest Inventory requires participatory approach, which requires many resources from the Vietnamese authorities in resources and funding. The Law on Forest Protection and Development mandates that the People's Committees at all levels are responsible for the forest monitoring, assessment and reporting activities. The Peoples Committees can hire consulting firms and experts if they do not have enough capacity to carry out all the needed tasks. Role of People's committees in implementation will be defined during the piloting phase.

2. Scope of the National Forest Assessment

Viet Nam has already a programme of assessment and monitoring forestry resources. This project is intended to improve the objectives of this programme to encompass the forest trees resources outside the forest boundaries and scattered over other land use system.

The project is designed to address, through data collection for further policy processes, strategies and analysis including a wide range of issues of the forestry sector and its relation to other sectors and information users. These include indicators on problems in relation to rural poverty, food insecurity, environmental degradation, rural unemployment and decline of contribution of the forestry sector to the national economy. To assess the resources in relation to these issues, decision makers require wide range of information on the functions of the forest and related socio-economic information in an integrated way. The project is designed to meet such complex needs. It must cover the biophysical properties of the resources such as extent of the forests, other wooded land and other land, volume, biomass and carbon and carbon changes in forests and trees, biodiversity, forest health and vitality, forest products and services, etc. It must cover also socio-economic and management variables including, users of resources, ownership, conflicts, user rights, local population's needs, protection status and management practices of resources, etc. considering their social, economic and environmental importance, trees outside the forest must be a main theme of the assessment. The data needs have to be prioritised keeping in mind cost-efficiency of the inventory, time limitations and funding. There may be also other sources of information, especially on socio-economic data, which has to be fully utilised in order to avoid overlapping work.

Figure 2. Main outputs of the National Forest Assessment Project (Map and Statistics)



3. Future Updating and Monitoring

In order to ensure continuous, strategic decision making and progressive development of forestry programmes in Viet Nam, the forest and tree assessment must be updated regularly. Continuous monitoring also helps determine the changes taking place in forest resources and establish trends.

The project will lead to an established network of permanent sample sites utilising where possible the existing PSPs throughout the country for which a national register will be created, including X and Y coordinates of the starting points of the sample plots, maps of each plot showing the limits of land use sections and tree location, distances and compass bearing to nearby natural permanent features, etc. Special emphasis will be put on use of remote sensing to provide information on changes and supporting the field inventory data.

As part of the national forest and tree assessment, the project will prepare, in close collaboration with FIPI, FSSP and other authorities within MARD/VNFOREST, a proposal which defines the requirements for the implementation of future updating and monitoring of the forest and tree resources.

VI. STRATEGY OF THE PROJECT

1. Element of the Strategy

The NFA Project is designed to improve the concept and the objectives of that existing NFIMAP as well as the quality and scope of bio-physical and forestry related socio-economic information with particular emphasis on monitoring the dynamic of changes in the land use system. The NFA is also aimed at collecting and providing data for the implementation of the National Target Program to Respond to Climate Change (NTP RCC), in general and the REDD+ implementation and GHG reporting, in particular.

This project has five main components:

1. Establish broad consensus at the national level on the needs and approach to NFIMAP in Viet Nam by taking into account national users' requirements and country's obligations to reporting to international processes, including REDD+;
2. Strengthen capacity of MARD/ VNFOREST, focusing on FIPI to collect, analyse and disseminate information on forest resources, users and uses;
3. Prepared bases to develop national forest and land use maps at levels and scales based on harmonised classification of forest and land uses and related definitions that serves also REDD+ monitoring and the development of the national Forest Management Information System (FOMIS);
4. Operationalize national assessment of the forest and trees outside forest resources;
5. Establish framework for a long term monitoring of the forestry resources.

The project will be funded by the FAO-Finland support to SFM in a Changing Climate Programme, which emphasises development of NFMA methodologies and tools. Besides the financing of the NFA, the FAO-Finland Programme on SFM in a Changing Climate will also provide additional technical and material support for the NFA.

2. Implementation Strategy

Future forest and tree assessment work must strive to harmonise NFA related methods and revise and improve the planned NFIMAP for 2011 - 2015. Technical procedures of the NFA will be reviewed during the inception phase of the programme. The methodologies will be first tested in two provinces and in the continuation it will be expanded to cover the whole country. At the beginning of the project FAO will support in developing the NFIMAP approach and methodology with other REDD+ related initiatives. This will benefit future updating and monitoring and will facilitate the sharing of information among the national and sub-national users of information and improve reporting to the international processes. This

applies to vegetation/land use mapping as well as to forest and tree assessment methodologies, fieldwork and data processing and analysis techniques. Developing these harmonised methods and approaches and preparing all necessary manuals should be a high priority of the project.

The project will aim at streamlining the forest inventory/assessment activities and strengthening the related national institution. Guidance to the development of the methodologies will be taken from the Planning mission report from August 2010 by Tomppo *et. al*. It defines the development needs and alternatives of the Vietnamese systems. The strengthened national institution will play a key role in future updating, promote modern techniques and integrated approaches, support exchange and sharing of information, expertise, training and transfer of technologies, provide training to the national personnel, monitor forest inventory/assessment activities in the country.

In order to meet the national information needs, implementation of the project will follow the international standards using the appropriate technologies. The focus of the project will be on forging national collaboration and partnerships and reinforcing cooperation between international partners to establishing a consensual basis for: i) developing the needed baseline information on land use systems; ii) harmonising approaches and techniques; iii) building institutional capacity and; iv) managing the generated information. Involvement of the traditional partners of Viet Nam and the national stakeholders in the NFA will ensure a participatory process of defining national norms and approach to resources assessments and monitoring, identifying users' needs and putting in place mechanisms for information management and sharing. The potential other components (2-4) of the FAO – Finland Programme will be linked to this process. Component 2 will provide support to develop stakeholder processes to define better the data needs for the NFIMAP. Socio-economic studies will be developed to support monitoring of REDD+ and drivers of deforestation. Special emphasis will be put on local governance method development, which may be implemented at the same time with Socio-economic House hold surveys.

FAO is also developing national level governance monitoring systems and methods with other development partners. The methods will be ready for use next year and Viet Nam will be one of the first countries where the methodology will be tailored to meet the country needs.

Institutionally, VNFOREST will be strengthened at central level to: i) develop harmonised methods and approaches to forest and tree assessments and monitoring; ii) prepare all necessary manuals; iii.) train the national personnel; iv.) plan assessment activities and oversee future updating; v) compile national statistics from the regional offices of FIPI; vi) manage the national database; vii.) facilitate the sharing of information among the national users and with the international processes and; viii) feed the policy process with relevant information. In the regions, regional branches of FIPI will be strengthened to play a key role for data collection, maintenance of the permanent sample sites, data processing and management for regional use. Close coordination with FORMIS be needed for the implementation of this component of the project in order to avoid establishing overlapping or parallel systems. The main purpose of the project in relation to FORMIS is to provide inventory and monitoring information on forests and forest trees outside forest-designated land.

In order to build the national capacity at the central and regional levels, the project strategy should emphasise maximum reliance on national expertise, supplemented by international technical assistance when required. A coherent training programme for all levels of personnel will be developed. During the initial phase, the training will cover introduction to satellite images interpretation and GIS, forest/land use mapping following remote sensing techniques, statistical design of field survey, database construction and data entry and storage, field data processing and analysis, information management and dissemination. The training will be assured by a team of international experts during the project cycle. This training will be achieved through workshops, seminars and practical training courses. In order to secure long term sustainability of the results, the project will support advanced overseas training as well as short courses in the area of forest inventory, assessments and information management. Two fellowships will be provided by the project for the M.Sc. studies and eight short courses. These studies, combined with on-the-job training, will have positive impact on the design and implementation of activities and on the sustainability of project results.

A full set of recent satellite images covering the entire country will be gathered and/or procured and used as input to the NFA/NFIMAP. FIPI will put in place a team and work jointly with other initiatives to interpret these images and produce a detailed national forest/land use map. The legend of the map will be defined through a wide consultation of the national institutions dealing with thematic mapping. It shall be harmonized[1] with the existing forest classifications in the country as well as with appropriately international forest classifications. The harmonized classification will assist the NFIMAP in producing results comparable with the country historical information base and will help redefine the characteristics of the permanent forest estate. It will also facilitate reporting to the international processes. The forest/land use map will improve the precision of area estimates of the different land use classes and be used as strong support to the fieldwork. It will also be a sound base for cost-effective monitoring overtime of changes in the land use systems.

FAO will utilise efficiently the experiences from other NFMA countries and linkages to international processes in order to develop an optimal methodology for NFA to meet and balance the decided data and information needs.

The project will work closely with inventory and REDD+ related initiatives in Vietnam e.g.UN-REDD Programme, Forest Carbon Partnership Facility (FCPF) and FLITCH. Besides, the Project also take into account requirement, guidelines and experience of the UNFCCC, IPCC and other REDD+ Programmes in other countries. The project will cooperate with them in forest carbon monitoring and developing methods for monitoring of REDD+ activities. Remote sensing methods such as multi-source inventory methodologies including LiDAR and SAR data may be piloted for improving accuracy and precision of the data in a pilot scale.

The project will help conceptualise the national data collection model based on the systematic. The permanent sample sites will be visited to collect the desired information on biophysical and socioeconomic variables of forest and trees as well as on their influences on/by the surrounding land use systems and people. The model of data collection will serve for the construction of the national database.

Some field data will be collected through interviews with a statistically representative sample of key informants (owners, managers, users of resources, and workers) and will cover all environmental, governance, social and economic functions of forests and forest trees outside forests. Such data will include variables on management, uses and users of the resources. Users of information will participate in defining and prioritising what to be collected and assembled by the project to achieve the outputs. It is important that the list of variables is produced beforehand through a wide consultation among the users of information taking into account the necessity to harmonise the nomenclature, classification system and definitions with the national and international reporting requirements. The methodology for the National Forest Assessment in Viet Nam will be designed and harmonised on the basis of national circumstances and FAO's experiences from other NFMA countries..

One major output of the project will be a design of national forest database that will be established to host the field and mapping data, to process the data and store the results for future updating and dissemination. It is also a network for exchange of raw data and information between the different levels of FIPI structure at national and local levels.. The project will work to assure that the national database on the forestry resources is compatible with the existing databases and is accessible to all authorized users and transparent and is designed to respond to different users needs. In reaching this objective, the tasks will be built on the experiences developed in other countries with FAO support. A system of information dissemination to all users will be put in place using all possible media and FORMIS. The structure of the national database and network will be the product of a wide consultation of national institutions and specialists. The project will also help in cooperation with FORMIS produce assessment reports e.g. State of Forestry in Viet Nam, and support in feeding to international processes, implementation of international agreements etc.

[1] Harmonise: to make or become harmonious or suitable, accommodate, adapt, agree (Webster comprehensive dictionary, 1995).
Harmonisation is based on existing concepts which should be brought together in a way to be more easy to compare. It can be seen as "bottom up approach" starting from an existing divergence and ending in a state of comparability.

VII. METHODOLOGY

The project will work to streamline the forest inventory/assessment activities and strengthen the commissioned institution. The project will be implemented in three phases namely:

Planning and training: All the preliminary arrangements and preparatory work of the project fall under this group of activities. It includes planning of the project activities and linkages to other FAO Finland Programme Outcome areas and UN-REDD, training of the national team (supervisors, field crews, and mapping staff) from central and sub-national levels, adjustment of the forest and TOF assessment methodology, inventory design, harmonisation of the classification system and variables according to national and international requirements, procurement of equipment and recruitment of the national and international personnel. International expertise will be provided to deliver specific inputs when required such as technical support in methodological refinement, training, information system development, data analysis and reporting.

Capacity building is a major activity of this project. The national team will be familiarised with the techniques and methods of forestry resources assessments, land use classification systems and identification of forest and TOF attributes to fully cover national information needs including reporting to the international conventions and processes.

The actual field survey is planned to be completed in 14 months depending on the definitions of the NFA approach and available resources. One field survey team composed of one team Leader, one assistant and two field workers per sub-national unit (9 regions). The field teams will function under the Sub-FIPIs, the Forest Resources and Environment Centre (FREC) and the Centre for Forest Information and Consultancy (CFIC) in the region. They will be supervised and coordinated by the Head of the Sub-FIPIs and Centres and by the Project Management Unit (PMU) set up at FIPI main office in Hanoi. The PMU, in addition to the logistics it provides to the fieldwork, backstops the teams to ensure that data is homogenously collected in the field and properly entered into the field forms. The personnel within the PMU will be composed of national and international staff.

Mapping and Remote Sensing. The project will make use of the existing appropriate RS images provided by the Vietnamese RS authorities and/or by any other development partners. Additional satellite images will be procured and tested in cooperation with UN- REDD in the NFIMAP piloting. The existing map production capacity will be utilised as a basis for the system. The most suitable remote sensing data will be selected by the remote sensing/mapping expert in collaboration with the national counterpart personnel. Two sources may be considered on the basis of the spatial, spectral and radiometric resolutions, quality of outputs and cost. SPOT 5 multi-spectral images has been successfully used for vegetation mapping and should be considered by the project team. The Project team should explore also other sources and their applicability to forestry/land use mapping. Scenes of higher resolution would be acquired for detailed mapping in the pilot provinces.

FIPI will put a team for the digital[2] interpretation of the satellite images and production of a forest/land use map/change map. Under the coordination of the national team of the project located at FIPI main offices, the technical personnel from the regional offices will carry out each for its region, the interpretation of the satellite data and validation of the interpretation. The mapping will be done on the basis of the consensual classification system developed by the project and harmonised with that used by FAO for international reporting as well as with the widely used national classifications.

Use of field surveys and RS data will be tested to improve the accuracy of REDD+ monitoring and reporting. Viet Nam has established a permanent sample plot system. However in the framework of this project some important issues need to be done: i) to identify and develop a set of parameters that need to

[2] Digital interpretation does not mean solely automatic supervised or non supervised classification. For the purpose of this project, the classification will be a combination of the supervised classification and the visual interpretation on computer screens.

be collected and the appropriate methods of data collection and calculation; ii) to re-design the PSP system to meet the GHG monitoring and reporting; and iii) to integrate these issues into the NFIMAP and/or GFMP proposal and training the technical staff to carry out.

The mapping information will be digitised and integrated to the field statistical information in a GIS platform. The field sample plots containing the land use section limits and location of the trees surveyed and their coordinates will also be digitised and stored in the GIS.

Field survey: the work-plan includes materialisation of the permanent sample plots in their selected field location, and data collection from measurements, observations and interviews of key informants (resource owners and/or users/managers and local communities) and data entry in the national data base.

The fieldwork is a crucial phase for the consolidation of the training of the national personnel and for data collection. The quality of planned outputs depends largely on it. Permanent observation sites will established across the country for long-term monitoring of changes within and between forests and the land uses. The existing sample site created by FIPI in the forest land will be used. New sample sites will be created in other lands and other wooded land for trees outside forest. GPS is a key instrument in locating plots with the assistance of latitude/longitude coordinates defined in advance on the topographic maps. The starting point of each plot is marked with a metal pole driven in the ground. Reference points around the starting point of the plot are identified, for which distance to and compass reading from the starting point of the plot are taken and recorded to facilitate relocating plots in future surveys. Photographs will be taken as supporting documents for future plot location.

Measurements of tree resource properties are done in all land use classes (forest, other wooded land, other land with TOF). The assessment will cover all benefits from forest and trees e.g. all products and services. A list of forest and tree variables to be covered by national assessment is provided with the FAO approach to NFA. These variables are to be reviewed and improved during a workshop that will be held in the beginning of the project. Interviews of key informants from local communities, NGOs, entrepreneurs, forest managers, etc are done in every sample site to identify major users of resources (men, women, children and other groups, the products and services provided by the forests and trees, the way these are managed and used).

During the technical discussions on the adaptation of the national monitoring design to encompass the new objectives of land use monitoring and resources in trees outside forest, the reference should be made to the design developed by FAO. The NFMA methodology is under improvements according to November 2008 NFMA Expert Consultation recommendations. The FAO NFMA plot design takes roots from similar designs developed, tested and widely applied in tropical forests over decades. Current the FIPI's plot design needs will be reviewed and redesigned in order to improve the accuracy and precision of the results for both NFMAP and REDD+ monitoring and providing reliable results for province level.

Normally stratification is not very well recommended in long term monitoring. "Hot spot" stratification criteria suggest that the country's main concern is land use change, which relates to REDD+ monitoring and GHG reporting. However, there are many other parameters of importance to the country. The question is what is/are the parameter(s) that should be considered for stratification. Making stratification on one parameter (land use change) means you favor one user of information on the others. These issues are to be decided by the owners of the project and the project will facilitate a workshop and supportive studies for decision making The NFA will review and amend the design in the inception workshop.

Vietnamese forests are highly fragmented, which sets specific demands for the sampling scheme, logistics in field inventories, RS materials and image interpretation methods. The inventory design should target of statistical accuracy and precision of the variables of interest. Existing NFIMAP data can provide good basic information for optimizing stratification, sampling design and plot size. Therefore at the beginning of the project the existing data is analysed and use for deciding the scope of the piloting and relation to national wide planning and implementation.

The project will create an additional field team for quality assurance of forest inventory. It will have the responsibility to revisit about 5 - 10% of the sample sites, already visited by the main teams, to recollect the data through measurements, observations and interviews. The performance of the principal teams will be assessed on the basis of the results of re-measurements. Unsatisfactory teams will either be dismissed or given additional training for improvement. The results of the re-measurements will also serve to assess the general quality of the field data.

Information System Development, Data Processing and Reporting: this phase includes the development of the national database and country information system for forestry with maps and field data; training of national staff in charge of the system and; data processing and analysis, reporting of project findings and dissemination of information. All partners and stakeholders will play a role in this process. The first will be organised to review and validate the project findings. The second will focus on the review and validation of the analysis of the sector on the basis of the project findings and will recommend follow up actions to take including review of national forestry programmes, review and adjustment of sectoral policy, identification of specific inventories and other conservation/development activities.

Integration to the Country Information System for Forestry, FORMIS: In many countries, forestry authorities are considering setting up country wide information sharing networks and systems. The design and scope of these systems varies widely. Below, some key points learnt from hands on experience and some 15 years in the forestry information systems business are outlined.

Resource shortage: Most government settings suffer from a resource shortage. It comes in two flavours: financial and human, at times both. Most of the time, human resources are easier to procure compared to systems, as system procurement often requires significant batches of financial support. Human resources can be bought in smaller quantities, and may already be available in the organization. This fact renders procurement of off the shelve systems less attractive, or entirely impossible.

Today many pieces of software and many tools are available as open source. Although the fine print should be read carefully, these tools regularly require nothing but brain power to be put in efficient non-profit use. Initial resources needed are one, or a few, knowledgeable programmers. It is quite possible to build incrementally, starting with the most urgent needs and later covering less pressing aspects of the system.

Infrastructure: Hardware is comparably cheap today. Systems for running them, as operating systems, can be downloaded for free. Windows operating system will be used to ensure compatibility with existing systems in FIPI, MARD/VNFOREST and FORMIS.

Almost all proprietary network solutions are today forgotten in favour of Internet. The hardware and software required for hooking up to Internet, and running internet applications and servers are widely known. Using Internet advanced applications can be set up covering all normal data maintenance and display needs.

Thus in the following, internet access is presumed.

Tools

Programming environments

The project will study alternative solutions for the database taking into consideration the existing systems and FORMIS. Open source solutions are developed in FAO to meet countries' NFA database requirements and they may offer competitive alternatives to NFIMAP.

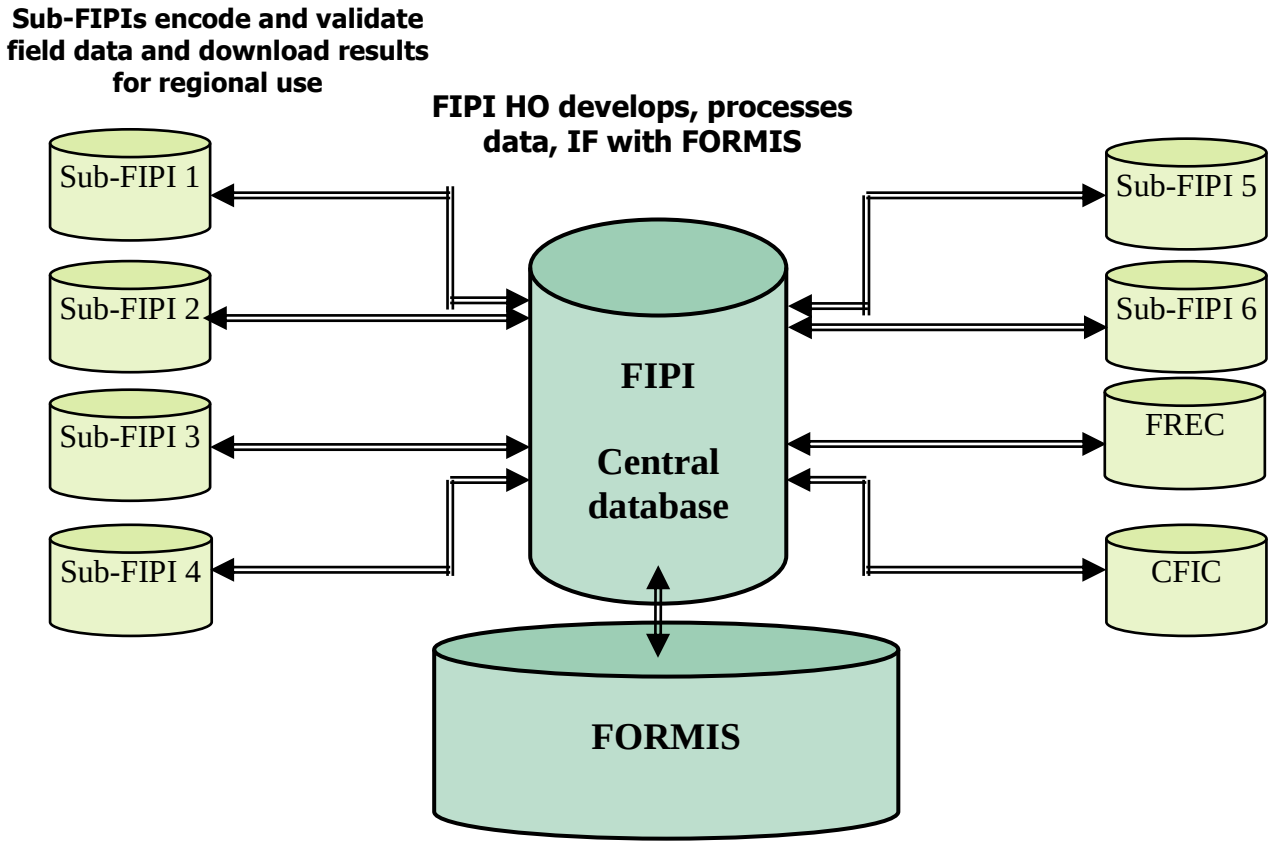
Databases: The most used open source database is mySQL, http://www.mysql.com/ Another, and in some opinions better, more robust alternative, is PostgreSQL, http://www.postgresql.org/ Also here it is easy to find support and people with experience.

Software: The Project will procure all needed software for the implementation of the activities on database management, analysis, reporting and image processing. Use of available public domain software will be prioritised, but keeping in mind applicability and compatibility to existing systems in government administration and other key projects in Viet Nam.

Systems: Internet based systems using the tools described above are sufficient for all normal computing needs. FAO uses an internet technology based financial system for instance. Almost all technical applications used in FAO are also implemented using the tools described above.

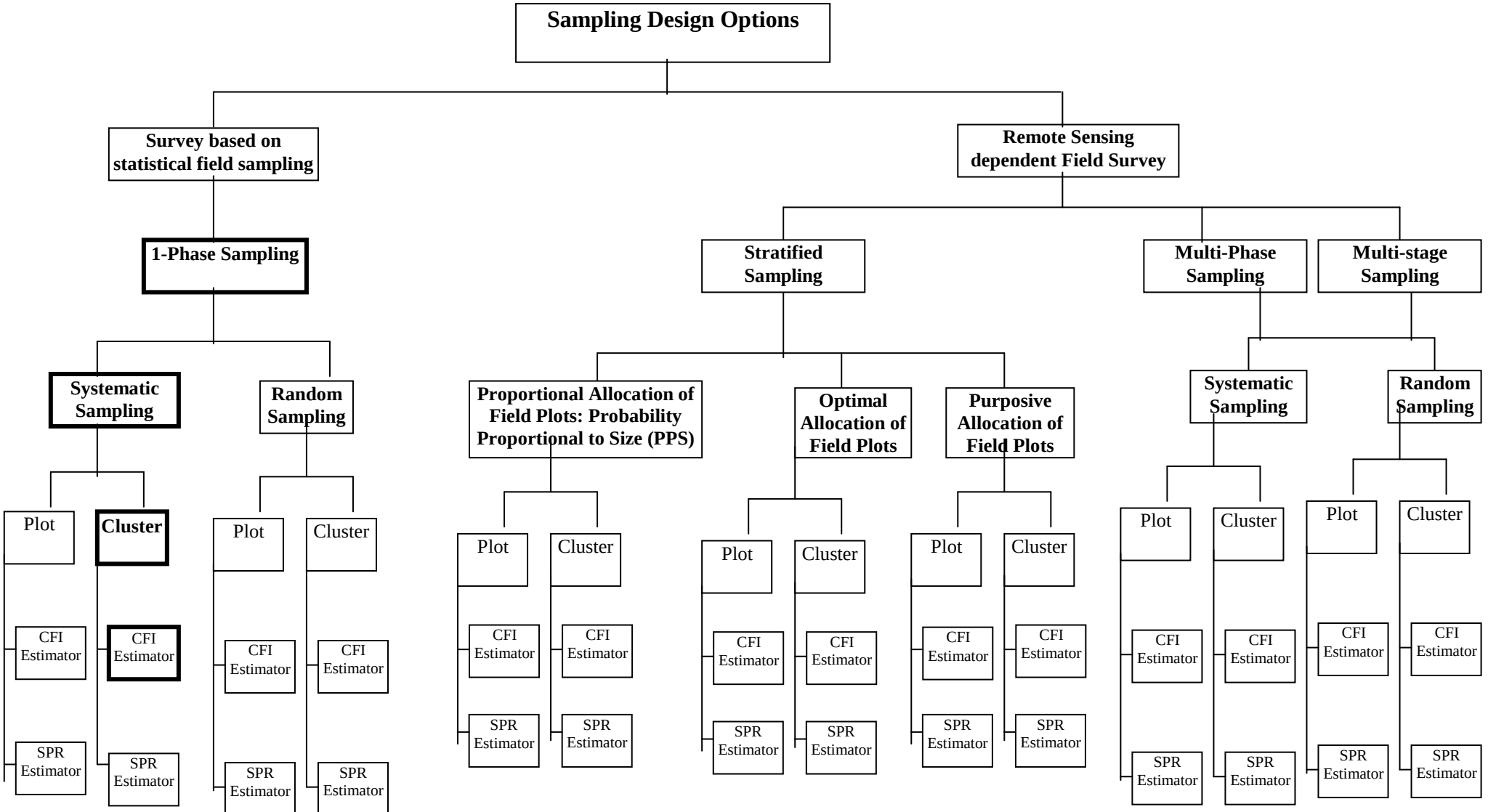
The strategy using open source tools and an incremental approach is the most cost efficient approach. The project will cooperate closely with FORMIS in order to guarantee integration of the Project systems to FORMIS and to avoid overlapping or parallel activities. Detailed planning of the database systems will be made during the inception of the inception phase project.

Figure 3: Configuration of network for database management
Between FIPI Main Office, 6 Sub-FIPI Regional Offices, FREC and CFIC



Requirements:
A. Central level (UPS, Server and Access to internet)
B Six regional offices (Internet access, Work station and Web browser).

Figure 4: flowchart of sampling options



NB: 1-phase sampling carried out in parallel to mapping using remote sensing. CFI: Continuous forest inventory; SPR: Sampling with partial replacement

VIII. IMPLEMENTATION ARRANGEMENTS

1. Implementing Agency

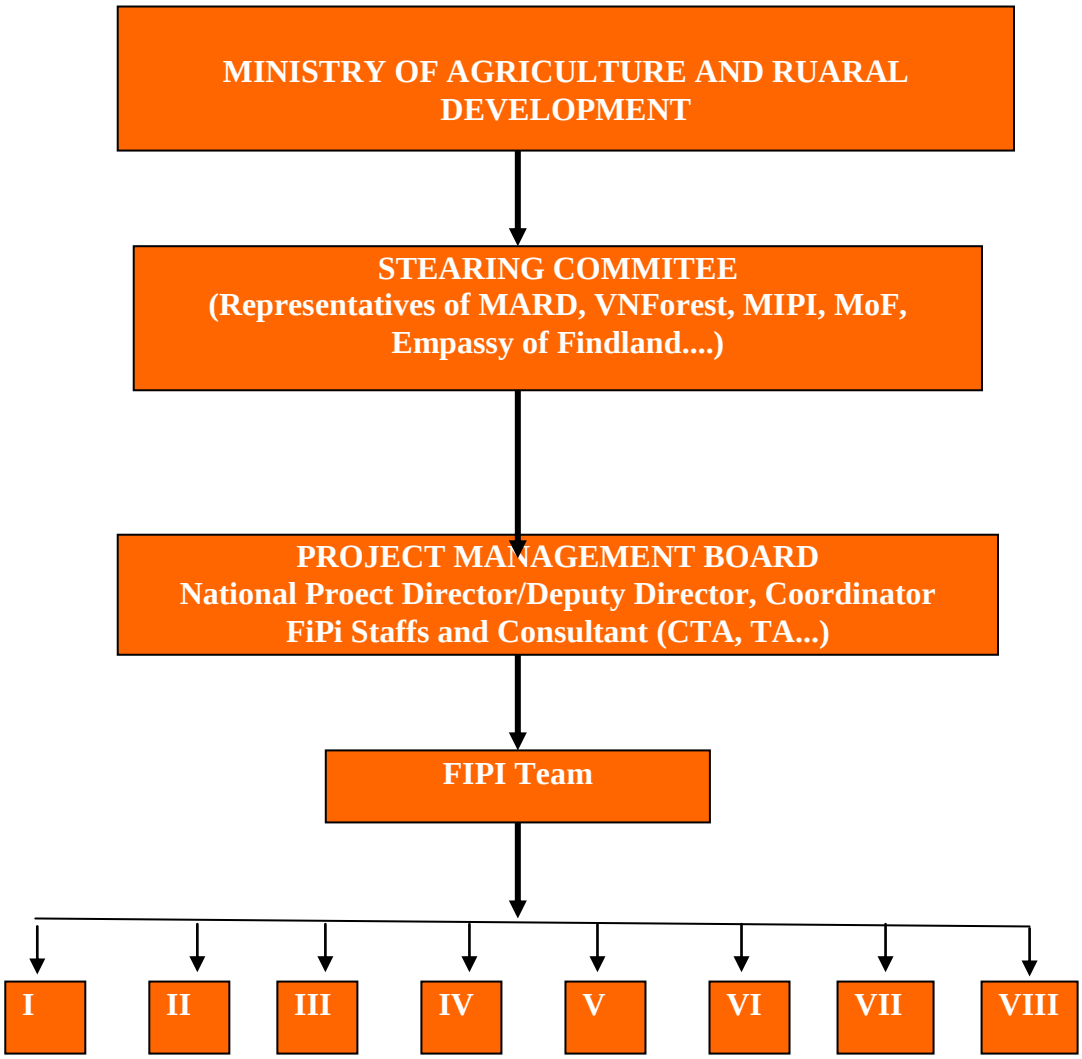
The executing agency will be VNFOREST. It will lead planning and implementation of the project activities and coordinate the interventions of the national stakeholders and partners when required, and guarantee the sustainability of project results for the long term monitoring programme. The implementing agency will be the Forest Inventory and Planning Institute (FIPI) in Hanoi and its Sub-FIPI services and centres in the regions. VNFOREST/FIPI will designate a National Project Director and Deputy Director who will, through a National Project Coordinator fully dedicated to the project, have overall responsibility for planning, management, coordination and supervision of project activities. It will also have responsibility for establishing a Technical Unit charged with the planning and oversight of project activities all over the country. VNFOREST will maintain oversight and will monitor the project implementation. It will also nominate participants for overseas training activities. The PMU will be based in FIPI HQ in Hanoi.

For the purpose of harmonizing methods and techniques and disseminating national information, the activities of forest resources assessment and information management in the country will be streamlined in collaboration with information users and FORMIS project. FIPI will make available all required personnel and adequate office space and field equipment required to enable planning and implementation of the project activities.

In order to ensure sustainability of the project results in the future, VNFOREST and FIPI, in accordance with their missions, will work to develop, expand and consolidate its programme of forest inventory, assessment and monitoring to include the trees outside forest resources and to cover all benefits to all users of forests and trees. Under this project and with the help of international assistance from FAO, MARD/ VNFOREST and FIPI will work to develop an innovative approach for resources assessment and monitoring and to introduce to its existing programme new concepts and technologies. FIPI will work to set up a lasting programme of resources monitoring and information management on the basis of the nationally accepted cost effective approach and the developed capacity. FIPI will ensure that the trained personnel will remain under the programme and will continue to receive the necessary technical and financial support from the Government.

In the past NFIMAP cycles (1991-1995, 1996-2000 and 2001-2005) FIPI has been the responsible organization for implementation. MARD/VNFOREST decided in the fourth cycle (2006-2010) that some specialized activities are implemented by FIPI and also other organizations are involved. The project organization chart is presented in the next figure.

Figure 5: Main activities required for the implementation of the NFA in Viet Nam



2. Project Steering Committee

A project Steering Committee (SC) will be formed to oversee the project implementation and administration. MARD/ VNFOREST will set-up such SC composed of policy-makers whose responsibility will be to monitor the implementation of the project and facilitate inputs to the project at all phases and ensure wider dissemination of the results. The SC will be composed of representatives from MARD's Departments VNFOREST, and FAO Representative, and chaired by a Vice Minister of MARD. The representatives from Ministry of Finance, Ministry of Natural Resources and Environment, Ministry of Planning and Investment and the Finnish Embassy in Hanoi will have observer status in the SC meetings. The SC is responsible for the effective coordination of the programme, the approval of all detailed work plans, budgets, and overall monitoring and evaluation of progress made. PEB decisions will be reached by consensus. The SC will have a meeting every three months or more frequently if need arises to review the progress of the project, assess achievements against the planned results, analyse the work plan for the next periods and recommend actions to take in case of constraints. At its discretion, it may recommend to MARD and to VNFOREST that amendments be made to the content, location, timing and implementation arrangements of project activities.

3. Project Management Unit

The Project Management Unit (PMU) is responsible for day-to-day management and **implementation of the project**, including the preparation of annual and three-monthly work plans, and financial and programmatic reports. The PMU is based in **FIPI Headquarter in** Hanoi and **will** consist of the following staff:

- 01 National Project Director (a VNFOREST Leader)
- 01 Deputy National Project Director (a FIPI Leader)
- 01 National Project Coordinator (a full-time FIPI seconded staff)
- 01 International Chief Technical Advisor
- International Technical Experts
- National Experts
- Secretaries/Accountants
- Interpreters
- Supporting staff
- Car drivers

National Project Director

The Vietnam Administration of Forestry (VNFOREST) will assign a leader as part-time National Project Director (NPD). The NPD shall be responsible to the GoV and FAO on uses of the Project resources and reporting on the project implementation progress as well as achievements. Especially, the NPD is in charge of coordinating the cooperation between the Project with relevant departments within and outside MARD, FAO and other development partners. The NPD shall make decisions related to implementation, monitoring and evaluation of the Project.

Deputy National Project Director

The Forest Inventory and Planning Institute (FIPI) will assign a leader as part-time Deputy National Project Director (DNPD). The DNPD shall assist the NPD to be responsible for day-to-day management and implementation of the NFA Project via PMU management.

National Project Coordinator

A full time National Project Coordinator (NPC) will be selected and nominated to manage the Project, including the project office. FIPI will nominate a suitably qualified and experienced person for NPC position, which will be approved by VNFOREST following consultation with FAO. The National Project Coordinator will be responsible for undertaking all project planning, directing and supervising the implementation of all project activities, ensuring cooperation among the personnel, for ensuring the implementation of participatory mechanisms, reporting progress to the Project Steering Committee, seeking appropriate assistance when required and promoting liaison and cooperation with other projects. The NPC will work under the general guidance of the NPD, DNPD and CTA.

4. The Role of FAO

Because of its wide international knowledge and experience in forestry resources assessment and in forest development that are directly relevant to the development objective of this Project, the FAO will support the

project with the identified expertise including international consultants for capacity building, forest assessment, remote sensing and mapping and information system development and data processing. Potential other FAO – Finland Programme Outcome areas (2 – 4) will be closely linked later to the project. Each consultant will provide in his/her area the technical input and monitor and evaluate progress and provide detailed technical advice on the project activities in his/her area of specialisation.

FAO will administer the technical assistance; provide operational and technical backstopping services from its offices in Hanoi (FAO Representative Office in Viet Nam), Bangkok (FAO/RAP) and Rome (FAO Headquarters) to ensure timely inputs to the project and smooth implementation at highest technical quality. The technical officers from FAO/HQs and FAO/RAP will make regular backstopping and oversight missions to the project in the field to ensure that high standards of technical implementation are maintained.

IX. LINKAGES AND COOPERATION

Asia-Pacific Forestry Commission (APFC), Asia-Pacific Forestry Outlook Study (APFSOS), Asia-Pacific Forest Invasive Species (APFISN),

Viet Nam policy is to be integrated better in the international economy and to promote international cooperation which will help implement national forest development programmes and obtain technical assistance, equipment and staff training support. The project is essentially designed to generate the needed knowledge that feeds into the national policy development process. It will also strengthen the role of Viet Nam in the different regional and international processes and initiatives e.g. the Asia-Pacific Forestry Commission, the Asia-Pacific Forestry Outlook Study, the Asia-Pacific Forest Invasive Species.

International processes and Global Forest Resources Assessment

The main orientation of the project is to facilitate, through bridging the information gap in the country and harmonising the information framework, the national reporting to FAO for the global Forest Resources Assessment (FRA) and to the international processes like CBD, UNCCD, UNFCCC, UNFF, etc.

Policy and legal frameworks

Government policy has been clearly stated in the "Vietnam Forestry Development Strategy for the period from 2006-2020)", Decree No. 99/2010/ND-CP on Payments for Forest Environmental Services (PES) and in the "Memorandum of Agreement for the Forest Sector Support Programme and Partnership (FSSP, 2001)". This is the basis for the proposed project. The legal framework recently issued for forest management, protection and development is well-conceived, and generally supportive to the project objectives. This includes the Law on Forest Protection and development (2004), Land Law (2003), Environmental Protection Law (2005), Resolutions and Decrees of the National Assembly and the Government, etc.

The project is therefore designed and will be implemented in line with the socio-economic policy orientations of the country including those of the forestry sector. Linkages will be established between the forestry sector and other policies and sectors to be consistent with the programmes that aim to strengthening the macroeconomic and rural development, poverty alleviation effort and natural disaster mitigation.

With other programmes and projects

Viet Nam has been benefiting and continues to benefit from a wide range of development assistance in the forestry sector. Depending on the nature and objectives of ongoing projects in the forestry as well as other relevant sectors, the present project will work to establish the linkage to benefit from their outputs, experiences and built capacity. The project will generate considerable knowledge on the state and location of the forest and tree resources, their management, use and users. Such knowledge and database will be readily accessible to other ongoing project.

The Asian Development Bank (ADB) is financing the Forest for Livelihood Improvement in the Central Highlands Programme (FLITCH) for addressing problems of forest loss, degradation and rural poverty through sustainable forest management. The Programme will include a component of forest inventory with a different protocol and plot design from NFA. FLITCH will include much less variables than the NFA. NFA will consider during the inception phase how to utilize the FLITCH inventory and how to fill in the gaps in the data. According to the present information FLITCH will collect data only in the production forests for a one-time inventory. Other potential field cooperation will the RS data, especially the high resolution satellite images and forest cover maps.

The Government of Finland and the Trust Fund on Forests (TFF) are financing the project "Development of Management Information Systems for the Forestry Sector (FORMIS)**"** with main objective to build the modern forest information system from central to local level, in order to provide accurate information for decision making for forest sector at all levels in Viet Nam. The project started on May 2009 and it will lasts 3 years. The national forest inventory Project will provide the required forest resource information for the national Forest Monitoring and Information System (FORMIS). The project contains the following main activities:

- Establish regulations, standards and procedures for managing, updating, and sharing of information between forestry units as basis for operations and for linking of forestry information systems;
- Carry out design and establishment of forestry information systems databases and software;
- Conduct training needs assessment, preparation of training materials, and data collection and ICT training courses in the selected provinces and at the central level;
- Provide equipments (hardware, network, data collection equipment) and software for MARD/VNFOREST/DARDs.

The main implementing agency is VNFOREST, in co-operation with other agencies under MARD/. FORMIS operates at the central level and in three pilot provinces (Thanh Hoa, Thua Thien Hue, and Quang Ninh), where it will give technical assistance in data collection, training, and pilot surveys within DARD. NFA will provide the key forest resource and related socio-economic data for FORMIS and therefore close cooperation is needed during the inception and planning periods.

The first phase of the UN-REDD in Vietnam was approved by the UN-REDD Policy Board in March 2009. The Objective of the UN-REDD Viet Nam Programme is "To assist the Government of Viet Nam in developing an effective REDD regime in Viet Nam and to contribute to reduction of regional leakage". Firstly, the programme aims to build technical and institutional capacity at the national level to permit the Government of Viet Nam, and especially the REDD focal point, VNFOREST, to coordinate and manage the process of establishing tools to implement a REDD programme. Secondly, it will build capacity at the local level (provincial, district and commune) through pilots in two districts in Lam Dong province (namely, Di Linh and Lam Ha districts) that demonstrate approaches to planning and implementing measures to reduce emissions. The UN-REDD Programme for Viet Nam is undergoing discussions for preparation of a Phase 2 programme for piloting REDD+ implementation in 5-6 provinces.

Viet Nam has also signed the participation agreement with the World Bank Forest Carbon Partnership Facility (FCPF). The final Readiness Preparation Proposal (R-PP) is submitted to FCPF for approval.

The NFA Project will closely collaborate with the UN-REDD in order to avoid overlapping and parallel structure and activities. Key cooperation areas related to forest inventory are the UN-REDD's activities in definitions of REL/RL and district level carbon monitoring. Measurement, Reporting and Verification (MRV) in REDD+ and GHG reporting can be seem more like an end-user of data and results coming from the NFA. Identification of additional data needs in UN-REDD may raise new requirements for data collection

methodologies, but quite much of these can be predicted when designing the new forest inventory system during the inception phase.

This project will act to establish linkages with other environmental and sustainable mountainous development programmes as well as bio-diversity programmes of the United Nations. It supports the development of the national MRV as both aims at developing a harmonized forest-related system of monitoring of and reporting on forestry resources and contributing to sustainable forest management.

The Finnish Forest Research Institution (METLA) and the University of Joensuu (Finland) have launched a co-operation program in 2010 with FIPI and VFU in researchers' training and research co-operation, teacher exchange, and piloting of modern forest inventory methodologies in Viet Nam.

Additionally, there are many other projects such as the Vietnamese and German Forest Programme, which has assisted to develop their sustainable forest management plans and many detailed forest inventories have been conducting to estimate the annual growth and allowable cut (AAC). of data (internal/external auditing; use of Internet, e.g. Google Earth maps).

Poverty alleviation Programme

In connection with poverty alleviation, the Vietnamese Government has been, for the past decade, implementing the broad National Programme for Hunger Elimination and Poverty Alleviation. The overall objectives of the programme are to improve food security, material and cultural conditions for peoples living in poor communes, based on sustainable management of local resources - natural as well as human - and to integrate the local communes into the mainstream of the national socio-economic development. The National Programme for Hunger Elimination and Poverty Alleviation has been fulfilled by a number of sub-national programmes and supported by numerous international programmes in a number of disadvantaged mountainous and remotes area. This inter-sectoral programme involves sectors such as agriculture, forestry, industry development, fixed cultivation and resettlement, rural credit, infrastructure, heath care and education.

The present project is in line with the objectives of the Hunger Elimination and Poverty Alleviation, notably by feeding into the policy process with timely and required information. Accurate information helps formulate accurate policies that address the most burning issues. The scope of outputs of the Project gives it a special importance to the food security programme.

Harmonisation of forest inventories in Viet Nam

The NFA Project will provide a good opportunity for harmonization of forest inventories, although some projects have already started or have their plans ready. Harmonization of forest information needs to become consistent with requirements of the IPCC GHG reporting guidelines, FRA/FAO guidelines, national FORMIS system, and other national and international requirements.

The following items/topics should be examined in the harmonization process:
scale, objectives, data needs, costs, and timeframe of different type of forest inventories;

- targeted variables of interest (e.g. *volume, biomass, C stock*);
- definitions, incl. *forest, forest classes, forest degradation classes (if applicable)*;
- all carbon pools to be measured, incl. *dead trees, litter, stumps, roots, soil carbon;*
- tree variables to be measured (e.g. *height, bole height, crown diameter*);
- units accuracy of measurements;
- coding of tree species and tree species grouping;
- limit values (e.g. *minimum diameter/height* for trees, saplings and seedlings);
- other variables to be assessed, biodiversity in general, socioeconomic data;
- sampling design, and targeted accuracy of sampling;
- spatial accuracy of field plot data;
- verification of data (internal/external auditing);

- use of Internet, e.g. Google Earth

In addition, the following more technical topics should be examined as well:

- introduction of field inventory methods which can support RS interpretation methodologies when using remote sensing data from various sources (e.g. Landsat ETM, SPOT-5, other image material, ALOS/PALSAR, and LiDAR data);
- consistent image classification methods, especially the role of visual interpretation needs to be studied;
- controlled data entry, and data verification rules for input data;
- data storage formats (e.g. Excel, SQL database, text file,..);
- data sharing standards and format (incl. XML Schemas);
- data analysis methods and options: height modelling method, calculation of timber volumes and biomass (availability of suitable functions), allometric equations, usage of biomass expansion factors (BEFs), wood density factors, root to shoot conversion factors, and carbon conversion factors;
- scenario modelling: how forest growth, mortality, and ingrowths are taken into account

X. BENEFICIARIES

Direct beneficiaries of the project will be users of forest information in the forest and related sectors, including local populations, associations, NGOs, local services and international partners. At the national level, this will include a generalised institutional benefit.

The project is expected to support the forestry development programmes in the country which impact particularly on rural inhabitants who are bypassed by mainstream economic developments and urbanisation. This rural development improves livelihoods for families, especially for women and youth.

OBJECTIVES OF THE ASSISTANCE

1. Development Objective

In line with the overall policy orientation of the GoV, the development objective of this programme is to contribute to the sustainable natural resources management and utilisation through improved, efficient and cost effective forestry related activities and to the sustainable development of the country and improved productivity of the rural livelihood, while at the same time contribute to the alleviation of poverty and enhance gender issues according to the policies and guidelines of FAO.

Impact

To make more accurate forest resource data available for forest management decision making and national reporting, through supporting establishment of the National Forest Assessment and Monitoring Program (NFIMAP).

2. Outcomes

The main objective of the NFA is to assist VNFOREST-MARD, focusing on FIPI in the development of the National Forest Inventory and Monitoring Programme (NFIMAP).

The project Outcomes are as follows:

1. Established broad consensus at the national level on the needs and approach to NFIMAP in Viet Nam by taking into account national users' requirements and country's obligations to reporting to international processes, including REDD+;
2. Capacity of VNFOREST and FIPI strengthened to collect, analyse and disseminate information on forest resources, users and uses;
6. Prepared bases for developing national forest and land use maps at levels and scales based on harmonised classification of forest and land uses and related definitions that serves also REDD+ monitoring and the development of the national Forest Management Information System (FOMIS);
3. National assessment of the forest and trees outside forest resources operational.
4. Framework established for a long term monitoring of the forestry resources.

The selection of the pilot province will be made based on the following criteria:

- institutional and staff capacity to carry out forest inventories and monitoring;
- forest resources are diverse to represent different conditions (e.g. different structure of forests and deforestation, degradation rate);
- role of forest products and services in the local economy is important;
- possible co-operation with on-going or planned other projects, and co-operation in methodological development or sharing data or newly acquired high-resolution satellite images purchased by the MARD/VNFOREST, FLITCH, GTZ, UN-REDD or by other agencies.

XI. OUTPUTS AND RESULTS

Outputs

Outputs have been identified per the five Outcomes, as follows:

1. Established broad consensus at the national level on the needs and approach to NFIMAP in Viet Nam by taking into account national users' requirements and country's obligations to reporting to international processes, including REDD+.

- Participation of partners and major users of forest information to the planning of the NFIMAP reinforced.
- National consensus on approach and method to NFIMAP and long term monitoring of resources established
- Assessment of data needs at the national and sub-national levels to implement the NFIMAP.
- Institutional set up reviewed and mission/approach redefined and endorsed by authorities and partners.

2. Capacity of VNFOREST and FIPI strengthened to collect, analyse and disseminate information on forest resources, users and uses

- Capacity development needs at VNFOREST and FIPI assessed and identified.
- Institutional set up reviewed, redefined and endorsed by relevant authorities
- Equipment procured and installed
- National expertise for NFIMAP reinforced.

3. Prepared bases to develop national forest and land use maps at levels and scales based on harmonised classification of forest and land uses and related definitions that serves also REDD+ monitoring and the development of the national Forest Management Information System (FOMIS);

- Forest type & land use classification system developed and harmonized in cooperation with UN REDD and forest, land cover and land-use maps produced at different scales and for different administrative levels and endorsed by partners and users.
- Forest inventory and monitoring database developed and integrated into the FORMIS database.

4. National assessment of the forest and trees outside forest resources operational.

- Assessment of the needs and requirements of the national information framework undertaken
- Field survey for data collection planned and carried out
- Quality assurance system established

5. Framework established for a long term monitoring of the forestry resources.

- Policies and strategies of the forestry sector reviewed and priorities redefined.
- Programme for long term monitoring of the forestry resources.

XII. LOGICAL FRAMEWORK AND PROJECT ACTIVITIES

The undertaking of an NFA project can be divided into four main steps:

- Assessment of information needs, available existing NFA related information, requirements and definition of inventory objectives including the integration with the NFIMAP objectives;
- Assembling of available information to support the design of the inventory, planning of the field survey, including sampling design, preparation of field and mapping manuals, purchase of equipment and capacity building;
- Data collection through field survey and satellite image interpretation/analysis of digital imagery, gathering of reference material;
- Processing and analysis of the collected data and publication of findings;

Each of these steps requires the knowledge and co-operation of many experts, not only survey statisticians, computer specialists and mensurationists, but also, according to the inventory objectives, specialists who provided necessary information in their own fields co-operated in the programme. The figure below provides a flowchart of activities to be undertaken to develop and implement an NFA for Viet Nam. The yellow boxes describe steps that will be finalised in the first four to six months of the project. The blue boxes describe the activities that have to be carried out in the period following the planning phase of the project. At the following the flowchart, the individual activities are described in detail.

Figure 6: Main activities required for the implementation of the NFA in Viet Nam

<table>
<tr><th>Steps</th><th>Main tasks</th><th colspan="4">Activities</th></tr>
<tr><td>Step 1</td><td>Alliances building and Analysis of Background Information</td><td>Analysis of Information Needs & Requirements (Bio-physical. Socio-economic and local governance) ▼</td><td>Alliances and Partnerships (UN REDD, FLITCH, and other projects) ▼</td><td>Analysis of Means (Infrastructure & Personnel) ▼</td><td>Analysis of Existing Information ▼</td></tr>
<tr><td>Step 2</td><td>Capacity Building</td><td colspan="2">Definition of Objectives in coordination with the NFIMAP ▼</td><td>Training and Institutional Strengthening ▼</td><td>Description: Data Formats, Quality, & Restriction of Availability ▼</td></tr>
<tr><td>Step 3</td><td>Identify Needs of Information and Develop Approach for bio-physical and Socio-economic and governance</td><td colspan="2">Variables, Terms & Definitions, ► Reference Units and Sampling Frames ▼
• Sampling design –linking with NFIMAP
• Plot Configuration ►
• Forest Types/Land use classification
• Data collection model
• Field forms
• Data base development/data processing</td><td colspan="2">General Approach to NFA/NFIMAP:
Survey Design Alternatives
▼ ▼</td></tr>
<tr><td>Step 4</td><td>Manuals and Guidelines</td><td colspan="2"></td><td>Development of RS in cooperation with other partners ▼</td><td>Field Manuals ▼</td></tr>
<tr><td>Step 5</td><td>Data collection (Survey and Mapping)</td><td colspan="2"></td><td>Mapping ▼</td><td>Survey ▼</td></tr>
<tr><td>Step 6</td><td>Data Processing and Policy Analysis</td><td colspan="2"></td><td colspan="2">Processing, Data and Policy Analysis ▼</td></tr>
<tr><td>Step 7</td><td>Publication of Findings</td><td colspan="2"></td><td colspan="2">Publication of Results:
- Database : Maps and Statistics
- Manuals and guidelines
- Policy analysis
- Improved institutional capacity
- Trained personnel</td></tr>
</table>

Table 1. Logical Framework

Objective, Impact, Outcomes, Outputs	Indicators	Means of verification	Assumptions
Overall objective: The programme contributes to the sustainable natural resources management and utilization, and to the sustainable development of the country and improved productivity of the rural livelihood, while at the same time contributing to the alleviation of poverty and enhance gender issues.	1) Reliable information about forest resources collected analyzed and reported across Viet Nam. 2) Improved human and technical capacity to carry out NFIMAP across Viet Nam. 3) Increasing number of stakeholders access and using forest related information.	1) National reports related to the state of the resources, management of related information, indicators of MDGs. 2) Records on stakeholders involvement. 3) Documents of policy and strategy regarding forest resource assessment, monitoring, and management and rural development.	National authorities committed, reflected by provision of needed legal, institutional and financial support and follow up of implementation of policies and related programmes.
Impact: More accurate forest resource data available for forest management decision making and national reporting, through supporting establishment of the National Forest Assessment and Monitoring Program (NFIMAP).	1) Improved forest inventory design; and data collecting, processing and reporting chain and capacity. 2) Decentralised data collection system feeds data to national reporting system FORMIS. 3) Number of completed courses, people trained and degrees obtained.	Records of minutes of SC meetings. Documentation of standards, agreements. Forest inventory manuals and reports. Progress reports about training courses and workshops.	MARD/VNFOREST assigns the necessary staff and resources to execute NFIMAP. FIPI is committed to review and develop their current methodologies in field assessments, RS and data management and sharing. Cooperation and shared results with other projects, incl. UN-REDD, benefits all parties.

Objective, Impact, Outcomes, Outputs	Indicators	Means of verification	Assumptions
OUTCOMES			
Outcome 1. Established broad consensus at the national level on the needs and approach to NFIMAP in Viet Nam by taking into account national users' requirements and country's obligations to reporting to international processes, including REDD+.			
1.1 Participation of partners and major users of forest information to the planning of the NFIMAP reinforced.	1) Number of partner organizations attended to project activities. 2) Roles of partners in the project agreed. 3) Linkages and level of co-operation with other on-going projects in Viet Nam and internationally.	Agreements. Joint-activities with stakeholders and other projects. Progress reports.	Organizations are willing to co-operate.
1.2 National consensus on approach and method to NFIMAP and long term monitoring of resources established.	1) Previous NFIMAP sampling design evaluated and an improved alternative sampling design presented. 2) Technical procedures of the NFA will be reviewed 3) Results from a national workshop on NFIMAP approach. 4) Document(s) on the approach of assessment and monitoring of forest and TOF resources prepared and approved. 5) Quality assurance system established.	Consultants' reports. Progress reports. Technical documents. Workshop presentations.	Broaden participation of partners and stakeholders in development of NFIMAP process. Partners and stakeholders work with MARD/ VNFOREST to reach/develop a consensual approach and process for national forest assessment and monitoring.
1.3 Assessment of data needs at the national and sub-national levels to implement the NFIMAP.	1) Needs assessment conducted. 2) Stakeholders consulted 3) Staff training plan prepared.	MARD/VNFOREST documents and records. Progress reports.	MARD/VNFOREST facilitates

Objective, Impact, Outcomes, Outputs	Indicators	Means of verification	Assumptions
1.4 Institutional set up reviewed and mission/approach redefined and endorsed by authorities and partners.	4) Number of reports, national workshops and technical meetings. 5) Proposal containing recommendations for institutional improvements at all levels prepared. 6) Agreed changes, new agreements and collaboration.	Signed agreements. Progress reports. Workshop presentations.	Broaden participation of partners and stakeholders in development of NFIMAP process.
Outcome 2. Capacity of VNFOREST and FIPI strengthened to collect, analyse and disseminate information on forest resources, users and uses			
2.1 Capacity development needs at VNFOREST and FIPI assessed and identified.	1) Training needs assessment prepared. 2) Staff training plan prepared and Staff trained.	Reports	
2.2 Institutional set up reviewed, redefined and endorsed by relevant authorities.	Plans prepared	Progress reports.	Government committed to revise the organization of the NFIMAP
2.3 Equipment procured and installed.	1) Number, quality and applicability of procured items.	Progress reports.	Government facilitates procurements.
2.4 National expertise for NFIMAP reinforced.	3) Adequate skills and capacity of staff in the use of new RS data, tools and methods. 4) Number of training courses and people trained.	Progress reports. Training material produced.	Government assigns the required personnel.
Outcome 3. Prepared bases for developing national forest/land use maps at levels and scales based on harmonised classification of forest and land uses and related definitions that serves also REDD+ monitoring and FORMIS.			
3.1 Forest type & land use classification system developed and harmonized in cooperation with UN REDD, forest, land cover and land-use maps produced at different scales and for different	1) Harmonised classification system of the forestry vegetation and land uses developed for the whole country. 2) Guidelines available for the interpretation of high resolution satellite images for forest	Progress reports. Technical documents.	Partners and stakeholders participate in harmonizing the forest/land use classification system. Government assigns qualified

Objective, Impact, Outcomes, Outputs	Indicators	Means of verification	Assumptions
administrative levels and endorsed by partners and users.	vegetation mapping. 3) Improved methods in use in RS data processing. 4) New national forest/land use map based on the harmonised legend prepared.		personnel for the mapping. Mapping is integrated to REDD+ process.
3.2 Forest inventory and monitoring database developed and integrated into the FORMIS database.	1) Content of databases. 2) Number of data sets provided for FORMIS.	Databases and image archives. Progress reports.	System for information dissemination on-line is operational.
Outcome 4. National assessment of the forest and trees outside forest resources operational.			
4.1 Assessment of the needs and requirements of the national information framework undertaken.	1) Data need analysis conducted with participations of various stakeholders. 2) Attributes in data collection (both biophysical and socio-economical) are accepted and defined.	Consultant's report. Progress reports. Workshop presentations.	Wide consultation and participation of partners and stakeholders.
4.2 Field survey for data collection planned and carried out.	1) Content and quality of field manuals on Bio-physical, Socio-economic and local governance 2) Field teams feed in high-quality data into the NFIMAP DB. 3) Data entry, validation and processing software are operational. 4) Forest monitoring system is in operation. 5) Staff is trained adequately. 6) A network of permanent sample sites remeasured and analysed.	Field manuals. Progress reports. Software. Databases and maps.	Sufficient staff, technical and maintenance resources are dedicated to the task. Quality assurance done in systematic way as to harmonize data collection between field crews.
4.3 Quality assurance system established	1) Manual prepared 2) Staff trainers	Manual Report from the field	

Objective, Impact, Outcomes, Outputs	Indicators	Means of verification	Assumptions
Outcome 5. Framework established for a long term monitoring of the forestry resources.			
5.1 Policies and strategies of the forestry sector reviewed and priorities redefined.	1) Number of special studies, people and organizations involved. 2) Acceptance and consensus achieved.	Survey reports. Workshop presentations.	Sectors work together in defining policy requirements for long-term monitoring of forestry resources.
5.2 Programme for long term monitoring of the forestry resources.	1) Functional framework for a concerted long term monitoring programme of the forestry resources exists. 2) Development and maintenance plans for the forest monitoring system are prepared.	Technical documents. MARD/VNFOREST documents.	Defined in co-operation with partners and stakeholders and supported by the national authorities
ACTIVITIES			
Outcome 1. Established broad consensus at the national level on the needs and approach to NFIMAP in Viet Nam by taking into account national users' requirements and country's obligations to reporting to international processes, including REDD+.			
1.1 Participation of partners and major users of forest information reinforced, and project coordination mechanism is operational.			
1.1.1 Setting up project management, incl. Steering Committee (SC)	Project management structure functional.	Project documents.	VNFOREST/MARD facilitates.
1.1.2 Preparation of the detailed Work Plan	Detailed work plan prepared	Project documents.	VNFOREST/MARD facilitates.
1.1.3 Kick-off seminar	Number of stakeholders participated.	Project documents, memos.	
1.2 National consensus on approach and method to NFIMAP and long term monitoring of resources established.			
1.2.1 Analysis of sampling design and forest monitoring system	Analysis completed.	Consultant's report.	Data from previous NFAs are available and in suitable format.
1.2.2 Preparation of improved alternative sampling design	Sampling design with associated data prepared and presented.	Consultant's report.	Data from previous NFAs are available and in suitable format.
1.2.3 Establishment of Quality	Documents prepared.	QA documents.	TA from FAO-Finland

Objective, Impact, Outcomes, Outputs	Indicators	Means of verification	Assumptions
Assurance (QA) system	Number of staff trained.	Project progress reports.	Cooperation Programme.
1.2.4 Preparation and updating of guidelines for mapping, data processing, and information management and dissemination.	Guidelines and datasets prepared. Amount and coverage of data.	Guidelines and manuals. Training materials. Databases.	Cooperation with other ministries (MONRE).
1.2.5 Documentation of NFIMAP approach	Documentation completed.	Guidelines and manuals.	
1.2.6 Workshop on NFIMAP approach	Number of stakeholders participated.	Project progress reports. Workshop agenda and presentations.	With participation of partners and stakeholders.
1.2.7 Official approval of improved NFIMAP approach	New initiatives and decisions made.	MARD/VNFOREST records.	With participation of partners and stakeholders.
1.3 Institutional set-up reviewed and mission redefined and endorsed by authorities and partners.			
1.3.1 Analysis of the institutional framework in order to secure better streamlining of the forest and tree resources monitoring and assessment.	Analysis completed.	Consultant's report.	Wide consultation of partners and stakeholders.
1.3.2 Recommendations to improve the institution in charge and institutional cooperation of the information on forest resources to accommodate the NFIMAP activities and secure sustainability of the resources monitoring programme.	Baseline study and recommendations prepared.	Consultant's report. Project progress reports.	Includes a proposal for the possible reorganisation of the institution in charge of the NFIMAP at central and sub-national levels, define its job description and the necessary measures and tools to make the NFIMAP a lasting exercise.
1.3.3 Facilitation and seek for endorsement of institutional improvements; Workshop	Number of stakeholders participated.	Project progress reports. Workshop presentations.	Wide consultation and participation of partners and stakeholders.
1.3.4 Support for setting up agreed	Signed agreements.	Project progress reports.	

Objective, Impact, Outcomes, Outputs	Indicators	Means of verification	Assumptions
changes in the institutions.			
Outcome 2. Strengthened capability at all levels to collect and analyse the needed information on forests and trees for management planning, sustainable management of the forestry resources and REDD baseline, monitoring and accounting.			
2.1 Assessment of needs at the national and regional levels to implement the NFIMAP.			
2.1.1 Assessment of human resources, and state of information management.	Assessment completed.	Project documents and reports.	
2.1.2 Training needs assessment	Assessment completed	Questionnaires. Training plan.	
2.1.3 Assessment of the requirements of the long term monitoring programme of the forest and tree resources, taking into account needs of REDD+. Preparation of a proposal incorporating the unified approach to NFIMAP, activities, staff, funds, organization, etc.	Assessment report prepared. Proposal prepared.	Reports.	Close cooperation with other projects, especially UN-REDD.
2.2 Equipment procured and installed.			
2.2.1 Inventory of current data, equipment and investment needs	Inventory records prepared.	MARD/VNFOREST documents.	Government facilitates the process.
2.2.2 Planning and conducting of procurements.		Procurement plan and tender documents. Accounting documents.	Government facilitates procurements
2.3 National expertise for NFIMAP reinforced.			
2.3.1 Planning and implementation of training on mapping by using remote sensing techniques and focusing on applying harmonized	Training plans prepared. Number of trained personnel.	Progress reports. Training materials.	Training needs identified.

Objective, Impact, Outcomes, Outputs	Indicators	Means of verification	Assumptions
land cover and land use classification system.			
2.3.2 Planning and implementation of in-service training to the national team on forest assessment design and planning, information needs identification and data capturing.	Number of trained personnel and training days. Training material produced.	Progress reports. Training materials.	Government assigns the required personnel.
2.3.3 Planning and implementation of training on data processing and analysis, information management and dissemination.	Number of participants from different office locations in training. Number of training days. Training material produced.	Progress reports. Training materials.	Government assigns the required personnel.
2.3.4 Overseas short training courses in forest inventory and mapping related activities.	Number of training days. Number of trained personnel.	Progress reports. Syllabuses.	Government assigns the required personnel.
2.3.5 International study tour	Number of training days. Number of participants.	Study tour report. Progress reports.	Government assigns the required personnel. Contacts through FAO-Finland Cooperation Programme.
Outcome 3. Prepared bases for developing national forest/land use maps at levels and scales based on harmonised classification of forest and land uses and related definitions that serves also REDD+ monitoring and FORMIS.			
3.1 Forest type & land use classification system developed and harmonized, map produced at different scales and for different administrative levels and endorsed by partners and users.			
3.1.1 Further development of a harmonized classification system of the forestry vegetation and land uses for the whole country.	Proposal prepared.	Consultants' report.	Partners and stakeholders understand and recognize the utility of harmonized and improved information framework.
3.1.2 Review of the proposed classification system by professionals, scientists and the SC	Decision made regarding the proposal.	Minutes of meetings of SC. Progress reports.	Partners and stakeholders participate in the process.

Objective, Impact, Outcomes, Outputs	Indicators	Means of verification	Assumptions
members.			
3.1.3 Preparation of guidelines for the pre-processing, interpretation of high resolution satellite images and map production.	Guidelines prepared.	Manuals, guidelines, other materials.	Requirements for high-quality data and digital image processing are taken into account.
3.1.4 Preparation of a national forest/land use map based on the harmonized legend and carry out digital interpretation of the high resolution satellite images and preparation of the final map products.	Maps and GIS databases developed. Maps approved.	Maps. RS & GIS database.	Cooperation with MONRE, other projects (incl. UN-REDD, FORMIS). Implementing agencies assign qualified personnel for the mapping.
3.2 Forest inventory and monitoring database developed and integrated into the FORMIS database.			
3.2.1 Construction a functional database on forest and TOF, results being compatible with FORMIS.	Database design prepared. Database in operational use.	Technical documents. Progress reports.	Cooperation with other projects and organizations.
3.2.2 Processing of the existing field and GIS data from previous surveys to be comparable with data from NFIMAP.	Old datasets in uniform format.	Databases. Progress reports.	Data from NORDECO supported project is in digital format and available. FIPI works to geo-reference the forest and tree data. It will be ensured that old data are in uniform format and results are comparable between inventories.
3.2.3 Assistance in putting in place a system for information dissemination.	Number and amount (Mb) datasets stored and transferred.	FORMIS project reports. Progress reports. Technical documents.	In cooperation with FORMIS project

Objective, Impact, Outcomes, Outputs	Indicators	Means of verification	Assumptions
Outcome 4. National assessment of the forest and trees outside forest resources operational.			
4.1 Assessment of the needs and requirements of the national information framework undertaken.			
4.1.1 Data need analysis. Review on needs of information, and preparation of a list of biophysical and socio-economic variables.	Data need analysis conducted. Number of partners and stakeholders contacted.	Consultant's and project progress reports.	Wide consultation of partners and stakeholders.
4.1.2 Workshop involving representatives from partners and stakeholders to represent, discuss and finalize the national list of variables.	Number of stakeholder organisations participated. Number of participants	Workshop presentations. Minutes of meetings.	Active participation of partners and stakeholders.
4.2 Field survey for data collection planned and carried out.			
4.2.1 Preparation of field manuals.	Number of field manuals prepared and printed.	Guidelines and manuals.	Cooperation with other project, e.g. METLA ICI project.
4.2.2 Planning of operational field work and collecting of field data throughout the country.	Work plan prepared and confirmed. Number of mapping units checked and sampling units collected.	Work plans. Manuals.	Implementing agencies assign the required personnel and resources to the work at all levels. Quality Assurance system is in operation.
4.2.3 Setting up a scalable forest monitoring system with change detection features.	System design prepared. Quality of feedback.	System documents. Feedback from data end-users.	Cooperation with other programmes and ministries, incl. REDD+ programmes, METLA ICI and MONRE.
4.2.4 Technical assistance in data entry, validation and processing.	Staff and system has proven capacity to fulfil their duties.	Progress reports. Contents in databases.	Cooperation with other project, e.g. METLA ICI project.
4.2.5 National workshop to review and assess the project results.	Number of stakeholders participated.	Progress reports.	Involves large number of stakeholders in validation of project results.
4.2.6 Dissemination of information	Number of publications, articles, web pages,	Progress reports. Published	Whole country cannot be covered

Objective, Impact, Outcomes, Outputs	Indicators	Means of verification	Assumptions
about project results.	data records and hits on FORMIS portal, etc.	materials (articles, web pages, posters, etc.)	during the project's time span (3 years). NFIMAP takes 5 years.
Outcome 5. Framework established for a long term monitoring of the forestry resources.			
5.1 Policies and strategies of the forestry sector reviewed and priorities redefined.			
5.1.1 Analysis based on project's results.	Number of special studies. Number of participating stakeholders.	Consultants' reports.	Special studies as e.g. forestry sector in relation with other economic sectors, the state of the resources and their role in socio-economic development and food security. In view of the project findings, identification of priorities of the forestry sector for: (i) sustainable management of the resources; (ii) protection of environment; (iii) effective participation of local populations in resources management and conservation; (iv) improved contribution of the forestry sector in the national economy; etc.
5.1.2 Recommendations to improve policies, strategies and programmes in connection with the forestry sector, environment and family sector development in the rural areas.	Number of participating stakeholders.	Consultant's report. Progress reports.	Wide consultation and participation of partners and stakeholders.
5.1.3 National workshop to review and validate the analysis outcomes and recommendations of special studies.	Number of participating stakeholders.	Progress reports.	

Objective, Impact, Outcomes, Outputs	Indicators	Means of verification	Assumptions
5.2 Programme for long term monitoring of the forestry resources.			
5.2.1 Development of a concerted long term monitoring programme of the forestry resources.	Number of participating stakeholders.	Programme design documents. Progress reports.	Defined in co-operation with partners and stakeholders and supported by the national authorities. Foresees stable institutional framework, skills and government financial commitment.
5.2.2 National workshop to review, discuss and finalize the proposed monitoring programme.	Agreements and decisions made.	Progress reports.	VNFOREST/MARD active in the process.

XIII. INPUTS

a. Government Inputs

The inputs by the Government of Viet Nam will be provided both "in-kind" and in cash, some parts will be taken from the budget of the national forest inventory, assessment and monitoring programme. They will comprise the following items and services:

- National Project Director and Deputy National Project Director to oversee the project and take strategic decisions
- salaries and operating expenses of the national staff working in, and with, the project;
- salaries of the national staff participating on study tours and fellowships overseas;
- salaries of the national staff participating in the fieldwork for forest inventory and in mapping;
- costs of office space, furniture, facilities, electricity and communications, and any other cost incurred by the project with the strict needs, etc;
- operating costs of local transport;
- local costs for the support of visiting overseas missions, etc

The total cost of Government input is estimated as follows:

Items	Unit	Quantity	Unit cost	Total (US$)
1. National personnel				**165 600**
* National Project Director	MM	36	300	10 800
* Deputy NP Director	MM	36	250	9 000
* Forest Mapping Technicians	MM	36	200	7 200
* Forest Inventory technicians	MM	576	200	115 200
* Database Technicians	MM	36	200	7 200
* Administrator	MM	36	200	7 200
* Cashier	MM	36	150	5 400
* Cleaner (odd jobs)	MM	36	100	3 600
2. Contribution to Remote Sensing	L.sum	1	22 400	**22 400**
3. Contribution to forest inventory methodology development	L.sum	1	20 000	**20 000**
4. General Operating Costs				**258 000**
* Vehicles operations at PMU	Month	36	2 000	72 000
* Communications, fax, email…costs	L.sum	1	20 000	20 000
* Other facilities at Project HQ (office space, furniture, equipments…)	L.sum	1	60 000	60 000
* Other facilities at Sub FiPI (office space, furniture, equipments…)	Unit	8	10 000	80 000
* Other costs	L.sum	1	26 000	26 000
Subtotal				**466 000**
Contingency line (5%)				23 300
Grand Total Project Cost				**489 300**

b. Donor Inputs

The Donor will contribute funds for the, consultants (incl. travel), meetings, workshops, study tour, in country training, vehicles, field and office equipment, and for services in conjunction with the project implementation. UN – EU Guidelines for financing of local costs in development co-operation with Vietnam (hereafter referred to the EU Cost Norms) will be applied for the NFA project. A summary of Donor Inputs is given in the following table:

Items	Unit	Quantity	Unit Cost	Total cost
1. Equipment				
1.1. Office Equipment and Supplies				
* Forestry Information System				
- Workstation: (Hard disk with big storage capacity, extra hard disk for back-up with equal capacity, 21" large monitor and DVD writer)	Unit	2	5 000	10 000
* Regional Offices (Work stations; Internet access)	Unit	8	4 000	32 000
* Other necessary equipments				0
- Desktop computers	Unit	9	1 300	11 700
- Laptop computers	Unit	12	1 500	18 000
- B&W Laser Printers (A4-size)	Unit	12	600	7 200
- Colour Laser printer (A4-size)	Unit	1	3 500	3 500
- GIS and Database software	L. sum			15 000
- Various supplies and consumables	L. sum			20 000
- Photocopier	Unit	2	3 000	6 000
Sub-Total Equipment and supplies				**123 400**
1.2 Forest Inventory Equipment (set for 15 field crews) including high-accuracy handheld GPS , Digital cameras, Field-maps (computer field map) and other field computers				130 000
1.3 Transport				
* Vehicles (4 wheels drive)	Unit	4	33 000	132 000
Sub-total Forest Inventory Equipment & Transport				**262 000**
Sub-Total Equipment				**385 400**
2. Staff Training				
2.1. International Training				
* Overseas Short Courses	Unit	4	20 000	80 000
* Study tours	Unit	8	6 000	48 000
Sub-Total International Training				**128 000**
2.2. National Training				
* Workshops	Unit	8	12 000	96 000
* Training courses for field personnel	Course	6	14 000	84 000
* Training courses for data analysis personnel	Course	3	5 000	15 000
* Training courses for RS	Course	2	6 000	12 000
Sub-Total National Training				**207 000**
Sub-Total Staff Training				**335 000**
3. Remote Sensing				
* Purchase of satellite images	L. sum			20 000
* Equipment and supplies	L. sum			20 000
* Field reconnaissance prior to interpretation	L. sum			10 000
* Air checking of interpretation	L. sum			15 000
* Edition and production of map	L. sum			30 000
* Other field expenses	L. sum			20 000
Sub-Total Remote Sensing				**115 000**

4. Technical Assistance				
4.1 International Consultants				
* CTA/Forest Assessment/Monitoring Expert (P4)	M/M	36	16 000	576 000
* Information System Development Specialist (P4)	M/M	2	16 000	32 000
* Data Analysis Expert (P4)	M/M	2	16 000	32 000
* RS/mapping Expert (P4)	M/M	12	16 000	192 000
* Unspecified Consultants (P4)	M/M	6	16 000	96 000
Sub-Total International Consultants				**928 000**
4.2 International Travel				
* Forest Assessment Expert	L. sum		10 000	10 000
* Information System Development Specialist	L. sum		10 000	10 000
* Data Analysis Expert	L. sum		10 000	10 000
* RS/mapping Expert	L. sum		10 000	10 000
* Unspecified Consultants	L. sum		18 000	18 000
Sub-Total International Travel				**58 000**
4.3. National Professional Personnel				
* National Project Coordinator	M/M	36	1 708	61 488
* Forest Inventory	M/M	36	1 455	52 380
* Software Specialist	M/M	24	1 455	34 920
* National RS expert	M/M	20	1 455	29 100
* Biometrician/Data Analysis	M/M	24	1 455	34 920
* Land Use Mapping Specialist	M/M	18	1 455	26 190
* Unspecified Consultants	M/M	58	1 455	84 390
* Secretary/Accountant	M/M	36	800	28 800
* Drivers Field	M/M	120	478	57 360
* Interpreter	M/M	36	800	28 800
* Supporting staff / Project assistant	M/M	72	600	43 200
Sub-Total National Counterpart Professional Personnel				**481 548**
Sub-Total Technical Assistance				**1 467 548**
5. In-country Travel				
* Travel of international staff	M/D	630	100	63 000
* Travel of national staff	M/D	2 500	50	125 000
Sub-Total In-country Travel				**188 000**
6. General Operating Expenses				
* Vehicles operation (36 months)	Unit	36	5 000	180 000
* Communications, faxes, emails, etc. costs	L. sum			20 000
* Other O&M costs	L.sum			7 552
Sub-Total General Operating Expenses				**207 552**
7. Expendable Procurement	L. sum			35 000
Sub-Total Expendable Procurement				**35 000**
8. Reporting (Technical reports and Terminal Report)				30 000
Sub-Total Reporting				**30 000**
Total Project				**2 763 500**

XIV. PROJECT REPORTING, REVIEWS AND EVALUATION

Reports

Reporting will be harmonized according to practises followed by donor community and agreed by FAO in Viet Nam. In case they do not have adequate guidance the following applies to the project reporting:

a. Six-monthly Progress Reports

The National Project Coordinator will prepare six-monthly reports on project progress containing:

- Actual implementation of activities compared to those planned in the work plan;
- Identification of problems and constraints (technical, human, financial, etc.) in implementation;
- Recommendations for corrective measures; and
- Detailed work plan for the following reporting period.

Progress reports will be submitted to bothVNFOREST and to the Donor Government for review and comments.

b. Terminal Report

Towards the end of the project and not later than six months before the end of the project, the National Project Coordinator will prepare and send to the Donor Government and to FAO Headquarters a draft Terminal Report for technical clearance, finalization and submission to the recipient at least 4 months in advance for consideration at the terminal Tripartite Review meeting. The report will assess, in a concise manner, the extent to which the project's scheduled activities have been carried out, its outputs produced, and progress towards achieving the immediate objectives and related development objective. It will also present recommendations for any future follow-up action arising out of the project.

c. Technical Reports

During the project implementation, the following reports will be prepared by the consultants and their counterparts:

- Report describing the general approach for the forest and tree assessment.
- Report on the vegetation classification system developed by the project team
- Report describing the national database
- Manual for the forest inventory teams;
- Manual for data processing
- Report on the project statistical results;
- Results of the policy and strategy analysis of the forestry sector
- Report on requirements, responsibilities and plan of actions for the forest and tree resources monitoring.
-

Reviews

The progress of the project will be jointly examined by the representatives of FAO, the Donor Government and the Government of Viet Nam. A mid-term TPR will be held at 18 months from the start of the project.

Monitoring

FAO will monitor the technical aspects of project implementation continuously through day-to-day communication and backstopping missions by technical backstopping personnel from Headquarters and the Regional Office.

Evaluation

This project will be evaluated by the global FAO - Finland cooperation Programme; Sustainable Forest Management in a Changing Climate organized by the FAO HQ.

Part III. Terms of Reference and Work plan

Annex 1: Terms of Reference

CTA/Forest Assessment/Monitoring Expert (IE – 1)

Terms of Reference

In 2007, Government of Vietnam defined the national policy for the forestry sector. The Vietnam Forestry Development Strategy for the period from 2006-2020, Decree No 99/2010/ND-CP on Payments for Forest Environmental Services (PES) in 2010, and the framework of the Memorandum of Agreement of the Forest Sector Support Programme and Partnership (FSSP), issued in 2002, delineated such policy to focus on the objectives of rehabilitating the sector and improve its social, economic and environmental functions through sustainable forest management. This was for the purpose of guaranteeing sustainable supply of multiple forest goods and services. The forest and tree resource assessment was identified as an urgent activity to develop the required knowledge to support the implementation of this strategy. As a matter of priority, MARD/VNFOREST put in place a programme to carry out a nationwide forest and tree assessment and set up a lasting monitoring system of the resources. The scope of the programme encompasses amongst others, institutional strengthening and capacity building in national forest and TOF assessment.

Under the direct supervision of the FAO Representative in Hanoi and guidance provided by the Lead Technical Officer (LTO) at FAO Headquarters and RAP, in coordination with the NPC, the Forest Assessment Expert will provide the technical assistance and support to FIPI and MARD/VNFOREST in the areas of capacity building, institutional strengthening, planning and implementation of the national forest and tree resources assessment and long term monitoring. The main tasks of the Expert are to:

1. Work closely with the national counterpart to prepare work-plan for the office and field activities of forest resources assessment;
2. Work closely with the national counterpart personnel to refine the approach to national forest and tree inventory based on the model approach of FAO to NFAs including needs of REDD monitoring and taking into account the existing national sampling design.
3. Assist the national counterpart personnel in elaborating a training programme to be dispensed to the national staff in the office and in the field involved in the project and assist FIPI in implementing it.
4. Assist the national counterpart personnel and other national and international personnel to strengthen FIPI for future monitoring of the resources and information management;
5. Assist FIPI in planning, running and servicing the workshops and seminars in connection with his field of expertise (informative seminar on the NFA approach, workshops on information and capacity building needs, project findings);
6. Assist in securing wide consultation to establish national consensus on the NFA approach and long term monitoring;
7. Assist in selecting and procuring equipments and supplies for the forest inventory component of the project;
8. Assist in organising and conducting the fieldwork;

9. Provide supervision to the field crews during the survey and provide technical guidance as to homogenise data collection and interpretation of variables and definitions. All teams will be closely followed during the start of the fieldwork;
10. Assist in organising field crew outputs and in filing them;
11. Prepare the project progress report on the component of inventory and the end of mission report;
12. Support design, linkages and implementation of other FAO-Finland Cooperation Programme Outcomes areas

Duration: 36 months

Duty Station: Hanoi, and travel inside the country

Qualification: The Consultant should have at least Msc. Natural Resources Management or equivalent with more than ten (10) years working experience and a background in forest resources assessment design, planning and competence in information system management and have experience in capacity building and project implementation.

Language: Good working knowledge of English language required.

Information System Development Specialist (IC – 2)

Terms of Reference

In 2007, Government of Vietnam defined the national policy for the forestry sector. The Vietnam Forestry Development Strategy for the period from 2006-2020, Decree No 99/2010/ND-CP on Payments for Forest Environmental Services (PES) in 2010 and the framework of the Memorandum of Agreement of the Forest Sector Support Programme and Partnership (FSSP), issued in 2002, delineated such policy to focus on the objectives of rehabilitating the sector and improve its social, economic and environmental functions through sustainable forest management. This was for the purpose of guaranteeing sustainable supply of multiple forest goods and services. The forest and tree resource assessment was identified as an urgent activity to develop the required knowledge to support the implementation of this strategy. As a matter of priority, MARD/VNFOREST put in place a programme to carry out a nationwide forest and tree assessment and set up a long-term resource monitoring system. The scope of the programme encompasses, amongst others, institutional strengthening and capacity building in national forest and ToF assessment.

Under the direct supervision of the FAO Representative in Hanoi and guidance of the Lead Technical Officer (LTO) at FAO Headquarters and RAP, the Information System Development Specialist (ISDS) will provide guidance and oversight to the national database developer in FIPI in the development of database applications supporting NFI. The ISDS will integrate, extend and contribute to the Open Foris open-source tools developed under the FAO-Finland Technical Cooperation Programme, while coordinating efforts with FORMIS and other relevant stakeholders.

The main tasks of the ISDS will be to:

1. Prepare inception report and submit it to the NPC and the LTO of the Project for comments;
2. Assist in selection and procurement of hardware and software required for NFI data processing;
3. In close collaboration with national counterpart(s) and FAO Headquarters, and in coordination with the FAE, apply the Open Foris platform and tools to produce a preliminary database, presenting it for review and comment by concerned parties (professionals from forestry and related land use institutions);
4. Finalise database on the basis of comments/recommendations of reviewers (professionals from forestry and related land use institutions) and provide and/or coordinate changes and enhancements as necessary;
5. Set up a functional database and forestry information system for the NFA, including network of regional Sub-FIPI Offices. Train the national personnel on its design, operation and maintenance;
6. Prepare a descriptive paper of the structure and functionality of the database and the forest information system/network;
7. Assist FIPI in planning, running and servicing the workshops and seminars that cover information needs, information management and capacity building;
8. Work closely with the FAE to review existing volume tables and other functions for computation in the database;
9. Support the data management lifecycle (data entry, validation, integration);
10. Prepare and submit end of mission report.

Duration: 6 months

Duty Station: Hanoi

Qualifications: The consultant should have at least an M.Sc. in information technology and a minimum of 10 years experience in database development and information management. The consultant should be conversant with the forest inventory, forest statistics, relational databases, GIS and remote sensing.

Language: Good working knowledge of English language required.

Data Analysis Expert (IE – 3)

Terms of Reference

In 2007, Government of Vietnam defined the national policy for the forestry sector. The Vietnam Forestry Development Strategy for the period from 2006-2020, Decree No 99/2010/ND-CP on Payments for Forest Environmental Services (PES) in 2010, and the framework of the Memorandum of Agreement of the Forest Sector Support Programme and Partnership (FSSP), issued in 2002, delineated such policy to focus on the objectives of rehabilitating the sector and improve its social, economic and environmental functions through sustainable forest management. This was for the purpose of guaranteeing sustainable supply of multiple forest goods and services. The forest and tree resource assessment was identified as an urgent activity to develop the required knowledge to support the implementation of this strategy. As a matter of priority, MARD/VNFOREST put in place a programme to carry out a nationwide forest and tree assessment and set up a lasting monitoring system of the resources. The scope of the programme encompasses amongst others, institutional strengthening and capacity building in national forest and TOF assessment.

Under the direct supervision of the FAO Representative in Hanoi and guidance provided by the Lead Technical Officer (LTO) at FAO Headquarters and RAP, the Information System/Database Expert (IS/DBE) will provide the technical assistance and support to FIPI within MARD/VNFOREST in the areas of capacity building, institutional strengthening and data processing and analysis. The main tasks of the Expert will be to:

1. Sort and analyse the collected data to meet the requirements of the project findings. This work will be coordinated with the FAE and IS/DBE. The DAE will analyze the data in accordance with the agreed strategy for producing results and statistical calculations and prepare the workshop presentation and store all findings in an easily retrievable format.
2. Refine the analyzed data and compile the relevant sections of the report for submission to the Government and to FAO. This will be done on the basis of the recommendations from the workshop on the project findings.
3. Ensure that the FIPI counterpart personnel fully understands all the work-processes related to extracting, sorting, processing and analyzing the collected data so that repetitions will be possible in the future with the FIPIs own capacity.
4. Report any technical problems related to the data and the Forest and TOF Resources Information System/Database to FIPI counterpart and to the LTO.
5. Describe all work performed in the form of a terminal report at the end of the recruitment period — to be submitted to and technically cleared by the LTO and the backstopping unit of FAO Headquarters. The report should contain: 1. ample descriptions to allow for accurate future repetitions of the work and; 2. recommendations for possible improvements of the database application and Forestry Information System/Network including a description of any technical problems and any ‘bugs’ encountered during the work
6. Assist in any other tasks under the project at the instruction of the LTO and the FAO Representative.

Duration: 10 months.

Duty station: Hanoi

Qualifications The consultant should have a strong background in information system development, database management, statistical analysis and be familiar with database applications (e.g., MS Access, PostgreSQL, MySQL, XML-based database) at an advanced level.

Language: Fluency in English is required.

RS/Mapping Expert (IE – 4)

Terms of Reference

In 2007, Government of Vietnam defined the national policy for the forestry sector. The Vietnam Forestry Development Strategy for the period from 2006-2020, Decree No 99/2010/ND-CP on Payments for Forest Environmental Services (PES) in 2010, and the framework of the Memorandum of Agreement of the Forest Sector Support Programme and Partnership (FSSP), issued in 2002, delineated such policy to focus on the objectives of rehabilitating the sector and improve its social, economic and environmental functions through sustainable forest management. This was for the purpose of guaranteeing sustainable supply of multiple forest goods and services. The forest and tree resource assessment was identified as an urgent activity to develop the required knowledge to support the implementation of this strategy. As a matter of priority, MARD/VNFOREST put in place a programme to carry out a nationwide forest and tree assessment and set up a lasting monitoring system of the resources. The scope of the programme encompasses amongst others, institutional strengthening and capacity building in national forest and TOF assessment.

Under the direct supervision of the FAO Representative in Hanoi and guidance provided by the Lead Technical Officer (LTO) at FAO Headquarters and RAP, the RS/Mapping Expert will provide the technical assistance and support to FIPI within MARD/VNFOREST in the areas of capacity building, institutional strengthening and land cover land use mapping. The main tasks of the Expert will be to:

1. Review and analyse the national and international land cover/land use classification systems and related definitions of relevance to the NFA Project in terms of classification system, thematic details, dates and methods of production, precision, etc;
2. Prepare, in collaboration with counterpart personnel, a national classification of land use/land cover in accordance with the agreed strategy for producing a harmonised classification system.
3. Define with FIPI the specifications of the needed remote sensing data and assist in acquiring the satellite images;
4. Define specifications of the land use map to be produced, and the mapping methodology.
5. Assess the capacity building needs for the mapping activity of the project a participate to the training to the national team;
6. Assist in organising the mapping team and oversee the LULC interpretation in the office and collection of training and validation data in the field;
7. Ensure that LULC mapping activities are coordinated with potential REDD+ MRV –related remote sensing monitoring activities in the country.
8. Validate the interpretation results, produce a final LULC map based on the harmonised legend and generate the statistical results on areas of the different land use units;
9. Ensure that the FIPI counterpart personnel fully understands all the work-processes related to the land cover/land use classification development, interpretation of satellite images, map production so that future repetitions will be possible with the FIPIs own capacity.
10. Report any technical problems related to the mapping work to FIPI counterpart and to the LTO.
11. Describe all work performed in the form of a terminal report at the end of the recruitment period — to be submitted to and technically cleared by the LTO and the backstopping unit of FAO Headquarters. The report should contain: 1. ample descriptions to allow for accurate future repetitions of the work and; 2. recommendations for possible improvements of the map;

Duration: 12 months

Duty Station: Hanoi with frequent travel inside the country

Qualifications: The consultant should have at least M.Sc. in forest mapping using remote sensing techniques and have at least 10 years experience in mapping related activities. The consultant should be conversant with the knowledge of integrated land use inventory, GIS, Mapping and Remote Sensing.

Language: Fluency in English is required.

National Project Coordinator (NPC)

Terms of Reference

In 2007, Government of Vietnam defined the national policy for the forestry sector. The Vietnam Forestry Development Strategy for the period from 2006-2020, Decree No 99/2010/ND-CP on Payments for Forest Environmental Services (PES) in 2010, and the framework of the Memorandum of Agreement of the Forest Sector Support Programme and Partnership (FSSP), issued in 2002, delineated such policy to focus on the objectives of rehabilitating the sector and improve its social, economic and environmental functions through sustainable forest management. This was for the purpose of guaranteeing sustainable supply of multiple forest goods and services. The forest and tree resource assessment was identified as an urgent activity to develop the required knowledge to support the implementation of this strategy. As a matter of priority, MARD/VNFOREST put in place a programme to carry out a nationwide forest and tree assessment and set up a lasting monitoring system of the resources. The scope of the programme encompasses amongst others, institutional strengthening and capacity building in national forest and TOF assessment.

Under the direct supervision of the NDP and DNPD, the National Project Coordinator (NPC) will assume managerial responsibility of the project, facilitate its smooth implementation and will report to MARD/VNFOREST. The main tasks of the NPC will be to:

1. Promote, liaise and maintain close working cooperation with the national institutions and regional/provincial services (including data providers and users) with relevance to the NFA project to ensure wide participation on decision making on the project and secure smooth implementation of all its activities.
2. Prepare and update in conjunction with the assigned FAO Experts a detailed work plans for project implementation. Detailed work plans will be prepared at least annually and more often if advised by the project Steering Committee and the NPD, or if required by FAO, MARD/VNFOREST or the Donor.
3. Implement the project work plans in accordance with work plan requirements. In close coordination with the LTO and the FAO/Hanoi, ensure timely delivery of equipment, recruitment, placement of consultants and reporting by them, selection of personnel for fellowships, study tours and other training activities, arrangement and fieldwork activities and project reporting.
4. Facilitate the nomination of the national counterpart professionals to the international experts.
5. Supervise, guide and monitor all personnel, including experts, in the project implementation. Ensure that all reports, manuals and other documentation prepared by experts and their counterpart are of high quality.
6. Plan and supervise the planning, implementation and monitoring processes of project activities.
7. Ensure that all Government inputs into the project (e.g.: office accommodation and administrative assistance, equipment, training and personnel) are available when required and are used by the project.
8. Arrange the travel and coordination arrangements for international fellowships and study tours.
9. Arrange internal travel in Viet Nam for international experts and their counterparts to the regions in accordance with the project needs.
10. Liaise with other projects that are active in assisting in the implementation of the national forestry development programme.
11. Arrange and supervise all workshops, training courses, seminars and fieldwork that are required for project implementation.
12. Assume responsibility for the submission of all project reports to MARD/VNFOREST in a timely manner.
13. Prepare periodic reports for the Project Steering Committee, Tri-Partite Review Missions, MARD/VNFOREST and FAO as required by the Project Document, including a terminal report.

Duration of Assignment: 3 years.

Duty Station: Hanoi, Viet Nam with travels in the country.

Qualifications:

A university degree, preferably at Masters level, in forestry with experience of at least 10 years of practical experience in Viet Nam in forest management, forest assessment/inventory, project management. The NPC must have an extensive knowledge of forestry and project management/administration.

Language: Vietnamese. Proficiency in the use of English required.

Recruitment: The National Project Coordinator will be selected and appointed by the Government and will be required to work ***Full Time*** on the Project.

Annex 2: Draft work plan

Major Activities	Years																																					
	Year 1												Year 2												Year 3														
Recruitment of International experts																																						
* Experts, see Annex 4.																																						
* FAO backstopping Experts																																						
Revision of the approach and preparation of work plan of the project																																						
National Seminar on project for partners and stakeholders																																						
Set up a Steering Committee for the Project and prepare programs of meetings																																						
Study and consultations on data needs, approach and design to NFA																																						
Workshop on NFA Approach (Conceptualisation of sampling design and data collection model from permanent plots)																																						
Selection and procurement of equipments																																						
Institutional analysis and streamlining of NFA activities																																						
Capacity building needs assessments																																						
Training and study tours																																						
In-country training (mapping, forest inventory and data processing)						M			I	I			P																									
Socio-economic and governance studies																																						
Selection and procurement of remote sensing data																																						
Field reconnaissance, interpretation of satellite images, checking of interpretation																																						
Production of final map																																						
Planning and organisation of fieldwork for forest inventory																																						
Field survey in pilot provinces																																						
Supervision/quality assurance																																						
Construction and development of National Database and linkages to FORMIS																																						
Data entry																																						
Analysis of the data and further design of the NFIMAP																																						
Data processing of current results and dissemination																																						
Analysis of results																																						

| | | |

Annex 3: Work plan for 2011

Activities	Budget $	FIN TA $	Counterp. $	2011	Collaborating agencies	Remark
Outcome 1. Established broad consensus at the national level on the needs and approach to NFIMAP in Viet Nam by taking into account national users' requirements and country's obligations to reporting to international processes, including REDD+	**162 000**	**162 000**				
1.1 Participation of partners and major users of forest information reinforced, and project coordination mechanism is operational	**18 000**	**18 000**				
1.1.1 Setting up project management, incl. Steering Committee (SC)	3 000	3 000			MARD, other ministries, Embassy of Finland	
1.1.2 Preparation of the detailed Work Plan	3 000	3 000			VNFOREST, FIPI	
1.1.3 Kick-off seminar	12 000	12 000			MARD/VNFOREST, MONRE, other ministries, Embassy of Finland. FIPI, FSIV, VFU, other projects	
1.2 National consensus on approach and method to NFIMAP and long term monitoring of resources established	**124 000**	**124 000**				
1.2.1 Analysis of sampling design and forest monitoring system	20 000	20 000			VNFOREST, FIPI, VFU	
1.2.2 Preparation of improved alternative sampling design	20 000	20 000			VNFOREST, FIPI, VFU	
1.2.3 Establishment of Quality Assurance (QA) system	20 000	20 000			VNFOREST, FIPI, VFU, FSIV	
1.2.4 Preparation and updating of guidelines for mapping, data processing, and information management and dissemination	30 000	30 000			VNFOREST, FIPI, VFU	
1.2.5 Documentation of NFIMAP approach	10 000	10 000			VNFOREST, FIPI, VFU	
1.2.6 Workshop on NFIMAP approach	24 000	24 000			VNFOREST, MONRE, FIPI, VFU, FSIV, NGOs, other projects	
1.2.7 Official approval of improved NFIMAP approach	0			not implementing during the 1st year		

Activities	Budget $	FIN TA $	Counterp. $	2011	Collaborating agencies	Remark
				I II III IV V VI VII VIII IX X XI XII		
1.3 Institutional set-up reviewed and mission redefined and endorsed by authorities and partners	**20 000**	**20 000**				
1.3.1 Analysis of the institutional framework in order to secure better streamlining of the forest and tree resources monitoring and assessment	10 000	10 000			VNFOREST, MONRE, FIPI, VFU, FSIV, NGOs, other projects	Consultant study
1.3.2 Recommendations to improve the institution in charge and institutional cooperation of the information on forest resources to accommodate the NFIMAP activities and secure sustainability of the resources monitoring programme	10 000	10 000			VNFOREST, MONRE, FIPI, VFU, FSIV, NGOs, other projects	linked to 1.3.1
1.3.3 Facilitation and seek for endorsement of institutional improvements; Workshop	0			not implementing during the 1st year		Outcomes of 1.3.1 and 1.3.2 can be initially presented in
1.3.4 Support for setting up agreed changes in the institutions	0			not implementing during the 1st year		
Outcome 2. Strengthened capability at all levels to collect and analyse the needed information on forests and trees for management planning, sustainable management of the forestry resources and REDD baseline, monitoring and accounting	**123 000**	**123 000**				
2.1 Assessment of needs at the national and regional levels to implement the NFIMAP	**36 000**	**36 000**				
2.1.1 Assessment of human resources, and state of information management	12 000	12 000			VNFOREST, MONRE, FIPI, VFU, FORMIS	
2.1.2 Training needs assessment	4 000	4 000			VNFOREST, VFU, FSIV	
2.1.3 Assessment of the requirements of the long term monitoring programme of the forest and tree resources, taking into account needs of REDD+. Preparation of a proposal incorporating the unified approach to NFIMAP, activities, staff, funds, organization, etc	20 000	20 000			VNFOREST,MONRE, FIPI, VFU, FSIV,UN-REDD	National consultants + FAO support
2.2 Equipment procured and installed	**12 000**	**12 000**				
2.2.1 Inventory of current data, equipment and investment needs	2 000	2 000			VNFOREST, FIPI	

Activities	Budget $	FIN TA $	Counterp. $	2011	Collaborating agencies	Remark
				I II III IV V VI VII VIII IX X XI XII		
2.2.2 Planning and conducting of procurements	10 000	10 000			VNFOREST, FIPI	
2.3 National expertise for NFIMAP reinforced	**75 000**	75 000				
2.3.1 Planning and implementation of training on mapping by using remote sensing techniques and focusing on applying harmonized land cover and land use	25 000	25 000			VNFOREST, MONRE, FIPI, VFU, FSIV, UN-REDD, other projects	
2.3.2 Planning and implementation of in-service training to the national team on forest assessment design and planning, information needs identification and data capturing	30 000	30 000			VNFOREST, FIPI, VFU	
2.3.3 Planning and implementation of training on data processing and analysis, information management and dissemination	20 000	20 000			VNFOREST, FIPI, VFU, FORMIS Project, UN-REDD	
2.3.4 Overseas short training courses in forest inventory and mapping related activities.	0			not implementing during the 1st year		
2.3.5 International study tour	0			not implementing during the 1st year		
Outcome 3. Prepared a national map based on harmonized classification of forest and land uses and related definitions that serves also REDD+ monitoring and FORMIS	**90 000**	**90 000**				
3.1 Forest type & land use classification system developed and harmonized, map produced at different scales and for different administrative levels and endorsed by partners and users	**55 000**	**55 000**				
3.1.1 Further development of a harmonized classification system of the forestry vegetation and land uses for the whole country	10 000	10 000			VNFOREST, FSIV, FIPI, VFU, UN-REDD, other projects	
3.1.2 Review of the proposed classification system by professionals, scientists and the SC members	10 000	10 000			VNFOREST, MONRE, FSIV, FIPI, VFU, UN-REDD, other projects	
3.1.3 Preparation of guidelines for the preprocessing, interpretation of high resolution satellite images and map production	10 000	10 000			VNFOREST, MONRE, FIPI, VFU	

Activities	Budget $	FIN TA $	Counterp. $	2011	Collaborating agencies	Remark
3.1.4 Preparation of a national forest/land use map based on the harmonized legend and carry out digital interpretation of the high resolution satellite images and preparation of the final map products	25 000	25 000			VNFOREST, MONRE, FIPI, VFU	
3.2 Forest inventory and monitoring database developed and integrated into the FORMIS database	**35 000**	**35 000**				
3.2.1 Construction a functional database on forest and TOF, results being compatible with FORMIS	20 000	20 000			VNFOREST, FIPI, FORMIS	
3.2.2 Processing of the existing field and GIS data from previous surveys to be comparable with data from NFIMAP	15 000	15 000			VNFOREST, FIPI	Work mostly carried out in 2010-2011 by NORDECO & FIPI Project
3.2.3 Assistance in putting in place a system for information dissemination.	0			not implementing during the 1st year		
Outcome 4. National assessment of the forest and trees outside forest resources operational	**80 000**	**80 000**				
4.1 Assessment of the needs and requirements of the national information framework undertaken	**12 000**	**12 000**				
4.1.1 Data need analysis. Review on needs of information, and preparation of a list of biophysical and socio-economic variables	12 000	12 000			VNFOREST, MONRE, FIPI, FSIV, VFU, other research agencies, other projects	
4.1.2 Workshop involving representatives from partners and stakeholders to represent, discuss and finalize the national list of variables	0			not implementing during the 1st year		
4.2 Field survey for data collection planned and carried out	**68 000**	**68 000**				
4.2.1 Preparation of field manuals	7 000	7 000			VNFOREST, FIPI	After 1.2.2
4.2.2 Planning of operational field work and collecting of field data throughout the country	49 000	49 000			VNFOREST, FIPI	
4.2.3 Setting up a scalable forest monitoring system with change detection features.	0			not implementing during the 1st year		

Activities	Budget $	FIN TA $	Counterp. $	2011 I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Collaborating agencies	Remark
4.2.4 Technical assistance in data entry, validation and processing	12 000	12 000														VNFOREST, FIPI, FORMIS	
4.2.5 National workshop to review and assess the project results	0			not implementing during the 1st year													
4.2.6 Dissemination of information about project results	0			not implementing during the 1st year													
Outcome 5. Framework established for a long term monitoring of the forestry resources	**0**	**0**															
5.1 Policies and strategies of the forestry sector reviewed and priorities redefined	**0**			not implementing during the 1st year													
5.2 Programme for long term monitoring of the forestry resources	**0**			not implementing during the 1st year													
SUB-TOTAL (Outcomes 1-5)	**455 000**	**455 000**															
6. Administration and procurements	**510 393**	**405 293**	**105 100**														
6.1 PMU management	**472 293**	**388 293**	**84 000**														
6.1.1 National Supporting Personnel Salary	89 933	43 933	46 000														170 person months (Counterp. budget)
6.1.2 Staff Travel, international staff	20 000	20 000															
6.1.3 Staff Travel, national staff	30 000	30 000															Local travel (car, accommodation, DSA)
6.1.4 Media, communication and technical support: telephone, fax, internet	6 500	5 000	1 500														lump sum
6.1.5 Office (Space, Equipment and Supplies)	67 360	49 360	18 000														9 months
6.1.6 Forest Inventory Equipment	57 000	52 000	5 000														lump sum
6.1.7 Car Procurement	132 000	132 000															4 vehicles
6.1.8 Vehicle operation costs	40 000	35 000	5 000														
6.1.9 Other O&M costs, other procurements	23 000	15 000	8 000														
6.1.10 Reporting	6 500	6 000	500														lump sum
6.2 Facilities at provincial level	11 100		11 100														
6.3 Remote Sensing	**27 000**	**17 000**	**10 000**														
6.3.1 Purchase of satellite images	14 000	7 000	7 000														
6.3.2 Equipment and supplies	13 000	10 000	3 000														
TOTAL	**965 393**	**860 293**	**105 100**														

Annex 4: Work schedule of consultants, experts and support staff

	Description	Total pm	2011 I	2011 II	2011 III	2011 IV	2011 V	2011 VI	2011 VII	2011 VIII	2011 IX	2011 X	2011 XI	2011 XII	2012 I	2012 II	2012 III	2012 IV	2012 V	2012 VI	2012 VII	2012 VIII	2012 IX	2012 X	2012 XI	2012 XII	2013 I	2013 II	2013 III	2013 IV	2013 V	2013 VI	2013 VII	2013 VIII	2013 IX	2014 I	2014 II
	INTERNATIONAL LONG-TERM EXPERTS																																			
1	Chief Technical Adviser	36.0																																		
	Sub-total, pm	**36.0**																																		
	INTERNATIONAL SHORT-TERM EXPERTS																																			
1	Information System/Database Expert	2.0																																		
2	Data Analysis Expert	2.0																																		
3	RS/Mapping Expert	12.0																																		
4	Unspecified Consultants	6.0																																		
	Sub-total, pm	**22.0**																																		
	LOCAL EXPERTS																																			
1	National Project Coordinator	36																																		
2	Forest Inventory	36																																		
3	Software Specialist	24																																		
4	National RS expert	20																																		
5	Biometrician/Data Analysis	24																																		
6	Land Use Mapping Specialist	18																																		
7	Unspecified Consultants	58																																		
	Sub-total	**216**																																		
	GRAND TOTAL (TA Services)	**274.0**																																		
	Supporting staff PMU																																			
1	National Project Director	36.0																																		
2	Deputy NP Director	36.0																																		
3	Forest Mapping Technicians	36.0																																		
4	Forest Inventory technicians	576.0																																		
5	Database Technicians	36.0																																		
6	Administrator	36.0																																		
7	Cashier	36.0																																		
8	Cleaner	36.0																																		
9	Secretary/Accountant	36.0																																		
10	Drivers Field	120.0																																		
11	Interpreter	36.0																																		
12	Supporting staff / Project Assistant	72.0																																		
	GRAND TOTAL (Supporting staff)	**1092**																																		