Report on


# Policy Research on National Forest Inventory


**Prepared by Agus Setyarso**
**Principal Researcher**

**For UN-REDD Indonesia Program**

**November 2012**

# INTRODUCTION

**Rationale**

National Forest Inventory (NFI) was designed in 1990 with main focuses on: (i) providing quantitative base for forestry policy formulation and (ii) Forest resources monitoring at national scale. There were 4 components of the NFI, namely:
  a. NFI basic policy and main structure
  b. Satelite Digital Data Analysis
  c. GIS
  d. Forest Data System

NFI was supposed to be sustained with 5-year monitoring period. It was turned out that this monitoring has not always been performed. However, after 2 decades since it was commenced, the Government (Ministry of Forestry) has compiled various experiences and kessons learned from its implementation. Along the way, some contextual changes  were also observed, ranging from the political structural changes, issuance of new laws and regulations associated with governance and management of spatial organisation and forest areas, down to the changes in terms of issues and priorities. Political system has dramatically changes from centralised governance into decentralisation and autonomous system. Laws on Forestry; Laws on National Spatial Planning, Laws on Environmental Management and other land-related laws have been revised or renewed. Priorities of land-dependant development policy has put higher ranks for oilpalm, mining, and spatial infrastructure development, caused more forest areas to be released or converted to non-forestry purposes.

Issues on biodiversity conservation and other ecological dynamics have intensified as well. On top of these, responding climate change and more specifically REDD+ (reducing (carbon) emission from deforestation and degradation) are positioned as strategic political and policy directions.
In short, the framework condition underlining the NFI has changed significantly. New perspectives and new clients were introduced in the system. With that, the existing policy on NFI may not anymore be sufficient and effective as instrument for policy decision and as guiding frame for lower level inventory program in forestry.
While some improvements and adaptation to the newest technology and inventory techniques have been tried out to various program, the basic policy component of NFI system has yet to be re-visited

**Purpose**
The purpose of this activity is to provide recommendations on more efective policy on NFI such that its fucntions as instruments for forestry-related policy decisions, its accountability and credibility, and its power as guiding-frame for lower level inventory programs may be more effective and contextual to respond to the changing political governance, laws and regulations, policy, and development of issues such as forest conversion and REDD+

**Objectives**
The developmental objective is to set forest inventory system as the backbone for every policy decision and planning in Indonesia. The specific objectives for the research are as follow:
  1. To outline the situation of policy framework in the context of forest inventory,
  2. To identify the needs for the better policy in the context of national forest inventory
  3. To identify the gaps between the needs and the exiting policy framework
  4. To recommend improved policy setting in the context of national forest inventory

**METHODOLOGY**

1. **Research Hypotheses**
   Normative hypothesis:
   policy setting in the forest inventory is not sufficient to be used as the backbone for policy decisions and planning in forestry

   Operational Hypotheses:
   a. The goal and objectives of policies in forest inventory as stated in the legal framework do not reflect the basic needs for forest inventory
   b. Capacity in implementing national forest inventory is not sufficient to respond to the growing dynamics of inventory in forestry
   c. Governance in information, learning process and continuous development of national forest inventory is not well designed
   d. National Forest Inventory System is not sufficiently supported by necessary resources

2. **Situation analysis**
   Situational analysis is required to enable the system finds its position in the changed framework condition. It started with analysis on felt-aspiration of the changing clients, new perspective of client with respect to landuse change and REDD+, and then to be continued with the constellation of governance and laws and regulations, the changing institutional capacity of the system operators (Ministry of Forestry and its Technical Units, supported by autonomous based forestry offices), the experiences and lessons learned from the previous implementation of NFI, and the state of funding resources and management to support NFI.

3. Gaps Analysis
   Gaps Analysis is basically initiative to outline the degree of non-conformity between the "ought to be" as brought along by clients new aspirations and perspectives and the changed laws and regulations in the context of data and information provided by the NFI with the "what is" - that of the current state of insittutional capacity, power of learning, and state of budgetary and funding components. Some potential catalysts as being tapped from the dynamic of external influences may also be assessed in this analysis.
   Results of gaps analysis would be more on identification of "action space" that may in turn be clasified as immediate feasible actions, potentially feasible for longer term actions, and practically no-feasible actions.

4. Generating policy improvement
   Policy improvement is based on the gaps outlined from the previous analysis. Focused discussions by forestry-related policy experts and practicioners may be organised to agree on the most effective breaktrough during the immediate time and longer term period.
   Breaktroughs may be generated based on the following aspects:
   a. Policy, laws and regulation reform
   b. Intitutional and bureaucratic reform
   c. Governance and NFI managerial capacity improvements
   d. Human resources capacity building
   e. Policy on financial perspective
   Validation of the the proposed/improved policy recommendations will be carried out by contrasting the improved versus the existing performance of NFI system.

**Policy Implications**
Policy implications are non-dispossable component to produce effective implementation of the proposed policy. Policy implications may be assessed by reviewing the following issues:

1. Assesing policy risks and corresponding management on risks
2. Aligning the policy into current configuration of governance and management of NFI
3. Generating strategies on transforming the existing situation towards the full implementationof the recommended NFI new policy

**Organisation**

This policy research is organised by the Chamber of Academician, National Forestry Council of Indonesia (Dewan Kehutanan Nasional, DKN). UN-REDD Indonesia is the supporting institution, and Ministry of Forestry is the principal Client of the Research.

Research Agenda will be organised as follows:
1. Finalisation of the Concept Note by the Chamber of Academician in consultation with other Chambers at DKN
2. Approval from MoFor and UN-REDD
3. Preparation of Technical proposal by  the Chamber of Academician in consultation with other Chambers at DKN
4. Approval and mobilisation of resources
5. Implementation of NFI Policy Research
6. Reporting

**Research period**

It is expected that this policy research on NFI will be concluded within 3 months. However, the allocation of time has been shortened from 3 months to 1 month. With that, the research will lose some degree of in-depth-ness.

**SITUATIONAL ANALYSYS**

1. **Basic Legal Framework on Forest Inventory**
   The legal framework on forest inventory may be reflected by the following policy packages:
   a. Forestry Laws (Laws No.41/1999)
   b. Government Regulation No.44/2004 on Forest Planning
   c. Government Regulation No.06/2007 on Forest Area Organization and Management
   d. Ministerial decree No. 67/2006 on the Criteria and Standards for Forest Planning
   e. Various Ministerial Decrees on the forest inventory at management unit level

2. **Policy on Forest Inventory as Contended in the Legal Framework**

   a. *Policy content in the Forestry Laws 41/1999*

   - Forest inventory is positioned as part of the forestry planning (Article 12).
   - Forest inventory is to be implemented through surveys on the status and condition on physical situation of forest, flora and fauna, human resources, and condition of socio-economic of people living within and surrounding forest areas (article 13).
   - Forest inventory is hierarchically structured into:
     o National Forest Inventory
     o Forest inventory at regional level
     o Forest inventory at watershed level
     o Forest inventory at forest management unit level
   - The results of forest inventory should be used as foundation in forest area gazettement, preparation of forest resources accounting, preparation of forestry planning, and forestry information system
   - Detail regulation will be packaged in a government regulation

   b. *Policy content in the Government Regulation 44/2004*
   - Forest inventory is conducted to acquire and collect the data and information on resources, potential of natural wealth and respective environment completely
   - Forest inventory is structured as follows:
     o National Forest Inventory, that to cover all forest areas in Indonesia territory
     o Regional level to cover forest areas at provincial and or district/city
     o Watershed level to cover forest areas on watershed boundaries
     o Management unit level to cover working forest areas of forest management unit
   - Forest inventory is to be implemented on both state and private forests
   - The Minister assigns criteria and standards for forest inventory to be guided correspondingly (Article 6)
   - The minister organizes the National Forest Inventory (NFI), by conducting forest inventory covering on all Indonesia territory (Article 7)
   - NFI is to be executed at every 5 years, and to be guided by the implementation of inventory at lower hierarchy
   - Details of these directives are to be packaged in a Ministerial Decree

**Policy contended in the Ministerial Decree 67**

- The standard and criteria in conducting forest inventory covers the following items (article 3):
  o Aspects to be inventoried

- o Organizer
  - o Conduct of activities
  - o Results of inventory
  - o Documentation, dissemination, usage, and reporting
  - o Supervising, inspection, and controlling forest inventory
- Aspects to be included in the forest inventory includes: (i) state, usage, and coverage of land, (ii) Soil type, slope/topography, climate, hydrology, landscape, and natural symptoms, (iii) Condition of human resources and demography, (iv) Type, potential, and distribution of flora, (v) Type, potential, and distribution of fauna, and, (vi) Condition of socio-economic and cultural of communities
- Inventories are to be executed at every 5 years
- Inventory at forest management units is to be carried out annually on the respective operational blocks

## 3. The Need for better Improvement in Forest Inventory Policy

a. The need to outline the objectives of National Forest Inventory
b. The need for clarity of the clients to be served by National Forest Inventory
c. Needs for better capcity in implementing policies on NFI
d. Needs for governing information, continuous learning, and development of NFI
e. Needs to provide sufficient resources to ensure quality in the implementation of NFI
f. Needs to develop NFI in addressing forest-based carbon accounting

**GAP ANALYSIS**

1. **The gaps in outlining the objectives of National Forest Inventory**
The situation:

There is no genuine goal or objectives stated in the existing policy package (Laws 41/1999, GR44/2004): The statement found is more on the definition and not in purpose of aiming to any objective. *(" Inventarisasi hutan dilaksanakan untuk mengetahui dan memperoleh data dan informasi tentang sumber daya, potensi kekayaan alam hutan serta lingkungannya secara lengkap"*).

The felt gaps:

    a. The objective of forest inventory is just a definition, or more on taking picture of the forest (resources). It was not made clear whether the picture will be used for which needs in forest governance and management.

    b. The position of NFI in the context of forestry system was not clear

2. **The gaps for clarity of the clients to be served by National Forest Inventory**

The situation :

The existing policy packages did not mention any users, beneficiaries, potential victims) that to be served and supplied by data and information generated by NFI.

The felt gaps:

    a. NFI should had been the main supporting component in the forestry system. Components in the forestry systems to be supported and supplied by data and information generated by NFI should had been clearly outlined.

    b. NFI performance, as a result, cannot bu justified from the perspective of client satisfaction.

3. **Gaps in delivering sufficient capacity in implementing policies on NFI**
The situation:

    a. Planning on NFI is transformed into activity plan in the DG for Forestry Planning

    b. Types of information are considered as well covered in the existing regulations. Right now it is in the development process to include carbon MRV in the list of tasks within the DG for Forestry Planning.

    c. NFI Data is governed by DG for Forestry Planning

    d. The implementation of NFI activities is heavily depending on the capacity of Planning technical units at the regions (BPKH)

    e. Monitoring and evaluation is reflected in the format of monitoring and evaluation of activities, and little may be explored in the program level

The felt gaps:

    a. There is no specific NFI planning document.

    b. There is no gaps found significant in terms of capacity in implementing NFI. However, some regions may experience capacity gaps (knowledge, skills, and equipment)

    c. The capacity of NFI in guiding the lower level of inventory has not been well designed

    d. There is no sufficient validation of NFI conduct from expternal parties. External validation might be important to increase the credibility of the NFI system and invent tory results.

4. Gaps in governing information, continuous learning, and development of NFI

The situation:
    a.   Information on geo-spatial has been successful to some exptent to be synchronized with ither sourced data
    b.   Attribute data starts to be integrated to the spatial data

The felt gaps:
    c.   Continuous consultations to the high rank decision makers are needed, to anchor the information system into their decision processes
    d.    Lessons learning in NFI has not yet been organized in systemic ways
    e.   Whenever there is effort to develop NFI, it has still heavily depending on the external stimulus, not from the identified needs of the clients
    f.   Governing NFI requires consistent commitment from the leadership in forestry sector. There is no planned regeneration of new leaders in the development of NFI

5.   Gaps in providing sufficient resources to ensure quality in the implementation of NFI

The situation:
    a.   Human resources engaged in NFI are mostly working with the Ministry of Forestry. Human resources with high competency in forest inventory may disperse at various working units in the ministry. At sub-national level, knowledge and skills in forest inventory are fragmented and may only be considered as pool of competencies at BPKH (technical unit of MoFor on forest area gazzetement)
    b.   Financial sources for NFI are practically state budget allocated to the MoFor. Other sources of fund may be accessed to international donor.  The later case is also characterized by specific themes that are not necessarily address the comprehensive program of NFI.
    c.   Technology in forest inventory has been traditionally purchased or derived from international forestry world

The felt gaps:
    d.   Human resources deployed in the NFI system has not yet been managed properly. The staff and employees engaged in NFI are not neither standardized and equipped with clear career lad.
    e.   Financial resources to support NFI has not yet been planned by the needs for maintaining, managing and developing NFI system
    f.   Knowledge and technology resources has not yet been developed in accordance with the specific characteristics of forest resources in Indonesia.

6.   **Gaps in developing NFI in addressing forest-based carbon issues**

The Situation:

In November 2011, following Presidential Regulation No. 71/2011, Indonesia released two national standards for ground-based forest carbon accounting to support monitoring of forest carbon stocks changes for REDD+ and for inventory of GHGs in the forest sector. The two standards are:

- The standard for *ground-based measurement and estimation of forest carbon stocks* (SNI 7724) that gives guidance for field measurement and estimation of carbon stocks for the five carbon pools to support monitoring carbon stock changes with IPCC Tier 3 values. The standard will be applicable for all types of forest in Indonesia.

- The standard for the development of allometric equations to support ground- based forest carbon accounting (SNI 7725). This standard provides guidance for the development of allometric equations for estimating above ground biomass for mono species and mixed species, using destructive sampling methods. Allometric equation need to be calibrated for specific sites to reduce the uncertainty in the assessment of biomass, partly because trees of different species vary significantly in their structure and wood density. Destructive sampling is the most accurate method to estimate above-ground tree biomass, but is also extremely time consuming

The Ministry of Forestry is currently working on the development of a REL based on two sets of data: 1- data on land cover change gathered from landsat 5TM, landsat 7, ETM + (1990, 1996, 2000, 2003, 2006, 2009, 2010 and 2011), and 2- emission/removal factors gathered from existing sample plots used in the national forest inventory (NFI) (distributed in 5x5 km or 10x10 km grids). Between 1990-1996 they amounted to 2,735 cluster plots; from 1996-2000, 1,145 cluster plots were established; 485 sample plots were set between 2000-2006, and 2,297 cluster plots between 2006-2010. It is expected that between 2012-2014, 599 new cluster plots will be established each year.

Related to the above mentioned initiatives The National Action Plan on GHG (RAN-GRK) on forestry and peatland has been issued and being transformed into sub-national action plan (RAD-GRK). Eleven major measures to take place have been outlined. Supporting activities to these actions that related to forest inventory, are, namely:
- Inspection, monitoring on the condition of peatland
- Survey and collection of hydrology and hydro-geology on peatland
- Audit on provincial spatial arrangement
- Collecting data and information on spatial planning

The felt gaps:
- There is a need to align the standards of measurements into NFI system
- There is a need to review the standards of measurements to be accommodated in the technical standard of NFI
- There is a need to strengthen the NFI standard in peat land, hydrological and hydro-geological aspects

**RECOMMENDATIONS**

1. General:
   - It is recommended to reconstruct the NFI system to cope with the changing context of forestry, forest land use and tenurial issues, and emerging needs for non-timber forest products. Along this line, special attention should be paid to the immediate need for accommodating the focus and standards on measurements to support the national effort in aiming to 26% emission reduction level by 2020.
   - It is recommended to make the policy framework in NFI more visible and showing the mindset of forest inventory as the backbone of any policy decision and planning.
   - Reviewing Government Regulation No. 44/2004 sould be a good start to work with the above mentioned recommendations.
2. Specific:

   - The policy on NFI is recommended to be altered to enhance the chain of guidance from inventory system at national level down toi sub national forest inventory levels.
   - There is significant needs for capacity building in the implementation of forest inventory at sub-national levels
   - It is recommended to re-set policy setting on NFi to be more flexible in accommodating specific forest types and utilization types (inventory on community private forest at Java, forest types on small island ecosystem, forests with intensive silviculture, forest resources prioritized to deal with carbon emission issues, forests with potential rich of non-timber forest products including water and amenities, and forests with pressuring tenurial conflicts)
   - In the immediate time, there is a need for clear policy package in accommodating carbon in the NFI system
   - It is recommended to develop systematic production and career lad for competence human resources in the forest inventory, either those working with and beyond the government. Professionals in forest inventory are ready to be materialized trough standard competency assessment
   - There is a need to improve the institutional setting of NFI. NFI should be re-positioned as the main supporting component in the forestry politics, governance and management, and therefore it needs for stronger institution with stronger power of influences. Institutional reform may be directed to the following directions:
     - From bureaucratic setting to be reformed to functional and service-focused institution
     - From cost-center unit into cost effective or self-financed organisation
   - It is recommended to re-arrange the financial arrangement to secure the sustainability of NFI mission and its respective inventory systems guided by NFI at sub-national levels.