FUTURE DIRECTIONS OF THE FOREST RESOURCES ASSESSMENT PROJECT- PHILIPPINES

Background

In 2002, the Forest Management Bureau (FMB) within the Department of Environment and Natural Resources (DENR) has collaborated with the Food and Agriculture Organization of the United Nations (FAO) for the establishment of the Forest Resources Assessment (FRA) Project. The FRA project aims to generate information on the distribution of forest and trees resources outside forest based on tree species composition, ownership and management status, size of land holdings, commercial volume and growing stocks, among others.

The scope of the FRA project had broadened the earlier national forest inventories conducted in 1969 and 1978. The inventory component of the FRA project covered not only the legally classified forestland but also the alienable and disposable lands and/or private lands. Further, data collection went beyond the traditional measurement of the biophysical characteristics of the trees but also documented the stock and flow of wood and non-wood forest products and services.

Another significant milestone of the FRA project was the inclusion of the social, economic, and ecological attributes of the forest as one of its variables. Data such as ownership and uses and management of forest resources were generated, which were not given consideration in the earlier National Forest Inventory projects. These data were gathered through interviews of local forest users and other selected key informants. The bio-physical variables, on the other hand, were gathered through actual measurement and direct observation.

FRA results disclose that in 2004, the country has an aggregate forest cover of 7,162,560 hectares or 23.9% of the area of the country. This implies that the forest cover has increased to 1.771 million from 1997. Of the total forest, the natural forest covers about 6,535,368 ha or 91.2% while the plantation forest covers about 627,192 ha or 8.8%.

FRA data also show that about 2,102,942 ha of forest are under formal management, that is, covered with tenurial instruments. A large segment of the forest area has been designated as production forest. Of the total forest of 7,162,560 ha, 5,462,510 ha or 76% is intended for production purposes while only about 1,700,050 ha or 24% is designated for protection purposes. The protection forest includes natural reserve, national park, and managed protected area. The FRA results indicate that about 6,087,029 ha or 85% of the total forest is owned by the state, 1,044,486 ha or 14.6% by the private sector; 9,486 ha or 0.1% by municipal local government units (LGU), and 21,559 ha or 0.3% by local communities.

National Issues Relevant to Forest Resources Assessment Project

The FRA project also explored and provided in-depth analysis of forestry issues that are relevant like social, economic and environmental issues that affect forest management in the country. Among the major issues relevant to FRA are as follows:

- **Poverty and population problems in the uplands**

Poverty and population issues considerably sum up the roots of all socio-economic problems in the uplands. The lack of livelihood opportunities in the lowlands continually drives many poor families to live and eke out a living inside the forest zones. However, the main factor causing the phenomenal increase of upland population is their natural growth. As of 2002, approximately 24 million Filipinos are living within the forest zones. These people comprise the poorest segment of Philippine society. Many of these people practice shifting cultivation and depend on forest products for their livelihood. At the forest household level, the non-profit orientation of farm activities in favor of subsistence production perpetuated the erosive practices of the upland farmers even in the least suitable areas that led to the massive degradation of upland productivity. In doing so, they tend to modify the physical environment to meet their immediate needs, thus increasingly disrupting, or even destroying, the biotic components which are necessary for human's physiological existence. The ultimate impact of these activities is the continuing conversion of forests and designated forestlands to other uses. Meanwhile, the cycle of poverty and environmental degradation is perpetuated.

- **Shrinking natural forest areas**

The conversion of forests into non-forest uses leads to rapid shrinkage of forest areas and consequently the resources base. Although logging also contributes to forest degradation, agricultural expansion in the uplands does the most damage. Statistics show that even without legal logging from the natural forests, forest destruction continues to be unabated. For the last 10 years, timber harvesting in the natural forest by legitimate TLA holders average only about 5,000 ha annually. Yet, forest destruction still rings to a tune of about hundred thousand hectares or so annually (RMPFD, 2003). This observation shows that the factor that tremendously contributes to forest disappearance is unsustainable upland agriculture (forest conversion). The root cause of this is the poverty situation sweeping the country where about 34% of the country's population are considered poor and live below the poverty threshold level in the year 2000 (NSCB, 2003). In the same manner, there is 28.4 % incidence of poor families in the country. The incidence of poor families in the uplands is assumed to be a lot higher. In many CBFM sites, over 95 % of families are considered poor.

Considering the upland situation, still many Filipinos depend on natural resources systems for their subsistence. They have no time to confront the inexorable reality of ecological principles. About 24 million people live in upland areas and depend on agriculture and forestry for livelihood. Migrant farmers and upland dwellers continue to practice slash-and-burn subsistence farming to survive.

For the upland residents, the forest remains to be an attractive source of income. Cutting of trees is still a common source of income. The shortage of local wood supply as a result of selective logging ban in many areas creates a demand for illegally cut timber. This is the reason why timber poaching through carabao logging and other indigenous practices still flourish in many forests in the Philippines.

Soil erosion, deforestation and environmental degradation all point to the fact that the limits of the natural carrying capacity of the forestland is already being extended. Indeed, there are strong linkages between population growth, resource depletion, environmental quality, and the incidence of poverty.

- **Declining production**

From a net exporter of wood in the 1970s' and early 1980's, the country at present is a net importer of wood and other wood products. This shows that the country's wood production is not enough to meet its requirements for wood products. The lack of raw wood materials was triggered by many factors as follows: non-renewal of timber leases and licenses as well as granting of new ones as a result of Constitutional prohibition, cutting from old-growth forests has been banned since 1992 (through NIPAS Act or RA 7586 & DAO 02, 1992), timber concessionaires operating in secondary forests were either cancelled or suspended in the early 90s in view of emerging environmental problems allegedly caused by logging and the on-and-off policy of banning timber harvesting even in forest plantations, among others

The 2003 Philippine Forestry Statistics show that in 2003 only about 505,703 m^3 of logs were produced. Of this, about 177,566 m^3 were produced from the naturally-grown tree species and 328,137 m^3 from planted tree species. This exhibited a significant slowdown of about 11.5% from the 2001 log production of 570,890 m^3. In terms of producer category, the biggest slice of the log production pie came from holders of timber license agreement (TLA) and industrial forest management agreement (IFMA) that contributed a combined production of 292,853 m^3. In addition, about 16,566 m^3 were harvested from CBFM projects.

On the other hand, production of lumber increased registering a volume of 246,199 m^3, an upswing of 24.9% from the 2001 level (197,148 m^3). Also recording positive growth in production are veneer with 336,046 m^3 or about 31.9% increase from the 254,801 m^3 and plywood production with 350,891 m^3 or about 20% from the 2001 production of 292,294 m^3.

With regard to non-timber forest products (NTFP), negative growth were observed in the production of almaciga resin, anahaw leaves, bamboo poles, buri midribs and nipa shingles. Only the production of unsplit rattan has recorded a positive growth of about 3.6%, with 9.08 million lineal meters as compared to the 2001 production of 8.77 million lineal meters.

- **Continuing mismanagement of non-timber forest products**

Due to the decline of forest resources, the important role of non-timber forest products (NTFP) in the livelihood of many forest occupants should be given all the more attention. Thus, their utmost conservation is of paramount importance. However, the lack of information on NTFP resources prevents initiatives on their proper management. There are no reliable surveys of existing public and private plantation of NTFPs. If ever there exist, information on them are not readily accessible to users. This is compounded by the lack of information on resource assessment methods for NTFPs, their spatial distribution, growth and yield, reproductive biology, and

sustainable harvest, among others. Moreover, there are no comprehensive policies on NTFP.

Potential Benefits from FRA

Although there are still no quantitative valuations conducted as to the comparative benefits of FRA over status quo, it is indispensable from the management point of view. Among the major benefits from a continuing FRA system are as follows:

- FRA results provide information on the availability of wood, non-wood resources, and services from forests along geographic and even altitudinal ranges. It provides information on the extent of forest resources along points to where resource-extraction activities can be assessed if these are within or beyond sustainable levels. Thus, FRA provides valuable information for better resource management practices that would lead to sustainable use of forest resources. Hence, the potential for increased livelihood opportunities for local communities, economic opportunities for local businesses and improved national income from the forests.

- Since FRA results can show geographic distribution of traditional raw materials, this information can be used in tapping potentials of traditional consumers as well as the emerging markets both locally and globally. This would lead to more efficient siting of processing plants, marketing and product movements by relating location of processing facilities with geographic distribution of raw materials.

- The information about the distribution of raw materials along geographic locations can be useful in the strategic decision to invest on certain forest plantations considering the raw material requirements of local and regional economy.

- FRA provides information on the distribution and frequency of occurrence of forest species, hence, proper guidance on the institution of management caution and safety nets in areas where conservation of endangered species can be effected. NFA could guide policies and decisions on where, how much, land areas shall be designated as permanent production forests, permanent protection forests and other uses as provided in the 1987 Philippine Constitution.

FRA vis a vis Socio-Economic Development and Environment Protection

Socio-economic development and environmental protection are among the main thrusts of the government as enunciated in the Philippine Agenda 21 as well as in the 10-point agenda of the Arroyo Administration. The whole forestry sector aligns to these thrusts, as also provided and espoused in the Revised Master Plan for Forestry Development in the country. At present, the forestry sector still abides by the main forestry policy issuance which is Presidential Decree 705 of 1975, otherwise known as the "Revised Forestry Code of the Philippines." Since the PD 705 was issued, several new developments and concerns have emerged in forestry, both in the local and international fronts. Among these are the following: a) forestry and land-use implications related to climate change; b) forest certification; c) development and implementation of criteria and indicators for sustainable forest management; and d) increasing recognition of the role of forests and forestry in poverty eradication and support of sustainable livelihood, among others (RMPFD, 2003).

To cope with the globally emerging trends in forestry and local environmental concerns, implementing policies for the Code are being promulgated by administrative rules and regulations by the Executive Department. But these executive promulgations change with changes in the leadership of the Executive Department, leading to instability of policy. This situation does not encourage private sector confidence, thus forestry investments are low or not forthcoming. Local peoples and community stakeholders get frustrated and become skeptical of forest development initiatives of the government. As policy by administrative promulgation is unstable and sensitive to changes in the political dynamics of each government administration, it is also prone to pressure from powerful lobby groups. A proposed ***Sustainable Forest Management Act*** has been repeatedly filed and re-filed in Congress since 1990. But the central issue in the debates on the SFM Act is ***whether or not to impose a 'total logging ban."*** The FRA has the potential for providing critical information on forests and TOF in a cost-effective manner. But it needs institutional permanency and continuing credibility. It also needs to have a dedicated core of institutional advocates and institutional users, especially policy makers

In the past decades, information on land use/land cover data in the Philippines had been based on experts' interpolation or extrapolation of the results of the 1st and 2nd NFI and other available relevant information. Although forest inventory is periodically conducted in the legally classified forestland, the inventory is confined totally in areas covered by tenurial instruments; and the results are usually focused on the stand and volume density, particularly on how much wood is readily available for harvesting. Those areas not covered by tenurial instruments have not been subjected to on-ground forest inventory after the 2nd NFRI, thus information on their present situation is lacking or inadequate.

On the other hand, with the implementation of environmental policies that set aside old-growth forests as protected areas, the land base available for timber production from the natural forest had been reduced. As a consequence, plantation forests are expected to play a significant role in the future wood supply of the country. In view of the fact that considerable areas in alienable and disposable lands have been oriented towards wood production, information on the extent, location and volume of these privately owned plantations are necessary for informed decision-making. The continuing implementation of the FRA project, therefore, provides policy makers valuable information on the extent and quality of forest resources. It captures information on forest resources both in the legally classified forestland and alienable and disposable lands.

Relevant FRA Thrusts

Despite being a pilot project in nature, the FRA results have provided considerable contribution in updating information on forest cover in the Philippines. Thus, to ensure its sustainability of benefits and continuity of the FRA efforts, the DENR and FMB in particular has carefully drawn its future direction as follows:

- As an overall policy thrusts, there is a need for refocusing the policy on forest management into proper allocation of forest lands, particularly on where management of natural forests should be focused, where the initiatives on protected area management should be, where production forestry should be focused on, and where plantation forests development should be concentrated, as well as where community-based forest management (both in production and protection forests) should be given

more emphasis. These thrusts can thus be fleshed out as major considerations in the plan to finally delineate permanent boundaries of forestlands as mandated in the 1987 Philippine Constitution.

- Institutionalization and mainstreaming FRA – In September 2005 the DENR issued Administrative Order No. 20 which mandates the mainstreaming of project operations and management of special projects at the respective bureaus of the department. This implies that the implementation of the FRA project will be integrated in the bureau and should form part of its regular operations. In support to this directive, the FMB has integrated the FRA implementation with the Natural Forest Management Division (NFMD).

  The transformation of the FRA project into an organic unit in the FMB has the following mission: "continuing improvement of the country's capability in forest resources assessment, build-up and updating of local, regional and national forest resources information and continuing use of FRA results in improving decision making in forest policy formulation and sustainable forest management. This would necessitate increasing the number of FRA staff. This would likewise require the conduct of technical capacity building among FMB staff that would equip the FRA section with knowledge and skills that are necessary to address the increasing tasks and demands of FRA. Likewise, at the regional field offices, there is also a plan to create a project support staff under the office of the Regional Technical Director for Forestry whose functions would include among others forest resources assessment. As FRA focal persons will be eventually created in the Community Environment and Natural Resources Offices (CENROs) and in the Provincial Environment and Natural Resources Offices (PENROs), capability enhancement programs on FRA implementation would be necessary.

  To effect a meaningful institutionalization, continuing and stable logistics support in terms of equipment and funds must also be accorded to the FRA section.

  The FRA can also be a platform for launching various forest researches that are dependent on forest resources statistics. Along the way, methodologies for assessing NTFPs can be improved and refined to adapt to changing physical resources attributes as well as socio-economic settings where these resources are situated.

- Densification of FRA Tracts in the Forestland – The sample size of 389 tracts (excluding the 6 tracts that totally fell in sea water) initially identified through the grid system has a relatively high sampling error of ±7.92%. To reduce the sampling error would mean increasing the number of tracts to be covered by the assessment. The densification procedure will involve the establishment of additional tracts in the center of existing 4-tract cluster (quincunx). An additional of 147 tracts will be established in forestland. This will make to 536 tracts the total tracts in the country (A&D land: 182 tracts, Forestland: 354 tracts). The densification process including the remeasurement of the old tracts, which is planned to be carried out in a period of two years, will entail an investment cost of PhP23,257,809.60 or US$456,035.48

  The information generated by the FRA project shows that the country has approximately 620,000 hectares of established plantations and 40,000 hectares of mangrove areas. The sampling error, however, is quite high. This could be attributed

to the relatively low sampling intensity (0.0026%) whereby a tract measuring 1km x 1km represents about 77,000 hectares. In this regard, it is recommended that the inventory of established plantations should include the age as well as the spacing to determine the age class distribution, present volume and to project available volume in the future.

It is envisioned that the inventory of established plantation and mangrove areas at a higher sampling intensity (5%) should be implemented in collaboration with FAO-FORM to increase the level of precision and reflect the actual situation in the field.

- Completion of unfinished tracts – There are still 27 tracts to be completed, as follows: CAR (2): T013 & T020; Reg. 4-A (4): T101, T105, T106 & T126; Reg. 4-B (2): T150 & T229; Reg. 9 (1): T321; Reg. 10 (4): T308, T309, T311 & T323; Reg. 11 (3): T329, T343 & T354; Reg. 13 (2): T297 & T314; and ARMM (9): T310, T325, T356, T361, T374, T387, T388, T394 & T395. Completion of these tracts would complete the initial number of plots as required in the first FRA Project and would improve confidence in the estimates generated by the Project.

- Improvement in the FRA processes – Since FRA is a new approach, its implementation presented some difficulties to the field inventory crews in data collection as well as data entry to the data encoders. In data collection, such difficulties have been traced to, among others, faulty land use classification and recording of forest products/services. In data entry, the errors may be attributed to the unfamiliarity with the technical considerations in the whole FRA process, hence, low capability for detection of errors and resulting to the eventual encoding of erroneous data. Such data entry errors resulted to inconsistencies in the expected results and required several months of technical editing on the part of the national team. The process can be improved by retraining the team leaders and training of new members. Nevertheless, emphasis on carefulness in following recording instructions as well as familiarity with the errors encountered in this FRA project can help prevent repetitions of the same errors. This would entail close dissemination of these initial experiences with the field teams.

- Use and integration of FRA results in the national forest resources accounting (NFRA) framework. Since FRA results shall be part of the official Philippine forestry statistics, maintenance and expansion of the existing FRA tracts can be a permanent source of data for NFRA.

- Expansion of the FRA variables and additional analysis – Based on the results of the study, the FMB realized the necessity to include other data variables which are found vital and essential in the implementation of sustainable forest management in the country that were not yet captured in the field survey. Among others these would include the determination of the volumes of branches and twigs other than the bole. Considering the limited volume of timber extracted from the second-growth forest, branches and twigs have lately become materials of economic importance due to government thrust of resource conservation. Information on these expansion activities would also be useful in forest biomass determination and would be valuable input in computing natural carbon sequestration capacity of different forest types in the country.

Among the specific activities to be conducted under this expansion thrust are as follows:

- Revisiting and monitoring of FRA Tracts to add additional variables to be measured. Additional measurements shall be conducted to include inventory of non-timber forest products with economic and medicinal values within the tracts with natural forests. For tracts having forest plantations, Other variables shall be included such as age and diameter class distribution shall be determined to enable the forestry sector to determine the corresponding areas covered and volume of particular age class of forest plantation, their incremental growth through time, and the harvestable volume as well as the quality and health of forest plantations.

- There are no fauna recorded in the course of the inventory activities. Since fauna is equally important in the biodiversity aspect, it is recommended that fauna should likewise be recorded during the re-measurement activity in the near future.

- Measurement of tree branches with a minimum diameter of (5 cm diameter) could help determine the accuracy of biomass computation. Volume of twigs and leaves could also be estimated during the re-measurement activity.

- Expansion of variables to be measured would entail additional analysis as discussed earlier. Another valuable information that can be derived in subsequent re-measurements is the in-growth as new recruits become part of the inventory data as small trees not included in the previous measurement attained the required diameter.

- IEC of the FRA results – Fora among LGUs, other government agencies, non-government organizations, and private sector shall be conducted to disseminate FRA results as well as discuss with the forest stakeholders policies and programs related to forest management in their particular areas.

  Part of the IEC activities is putting the FRA results in the official website/s of the DENR. It can be useful in setting the Philippine forestry statistics straight and would also put to an end the endless debates on the matter where every organization has its own data to show, based on their own computations, all of which are apparently citing DENR data.

- Developing an action plan with realistic time tables to pursue the above plans - A workshop on this shall be initiated by FMB by first quarter of 2006 to be attended by relevant national and regional counterparts. Among the target outputs for this workshop are as follows:

  - Strategic but definitive FRA program and schedule based on the thrusts of DENR and according to the Revised Master Plan for Forestry Development
  - Determination of resources requirements and specific measures to obtain such resources
  - Program proposal for specific components that can be submitted to relevant funding institutions

- Institutional actions in all relevant levels for the adoption of the Plan

Indicative Timetable of Activities:

Activities	**Period of Implementation (in years)**						
	1	**2**	**3**	**4**	**5**	**6-10**	**11-25**
Action Planning (FMB and Regional counterparts)	→						
Institutionalization and mainstreaming of FRA	→	→					
Densification of FRA Tracts in the Forestland		·····	·····→				
Completion of unfinished tracts		→					
Improvement in the FRA processes	·····	·····	·····	·····	·····	·····	·····→
Continuing FRA		*		*		*	
Use and integration of FRA results in NFRA	·····	·····	·····	·····	·····	·····	·····→
Expansion of the FRA variables and additional analysis	→	→	·····	·····	·····	·····	·····→
IEC of the FRA results	·····	·····	·····	·····	·····	·····	·····→

Legend:

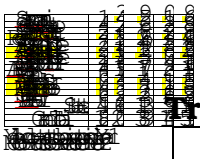
Dotted line (….): staggered implementation
Bold line (–): continuous implementation
Asterisk (*): re-measurement of tracts

Tract distribution by Region

Region/Province	Old tracts			New (FL)	Grand Total
	A&D	FL	Sub-total		
NCR	**2**	**0**	**2**	**0**	**2**
Metro-Manila	2	0	2	0	2
CAR	**1**	**23**	**24**	**22**	**46**
Abra	0	6	6	5	11
Apayao	0	5	5	5	10
Benguet	0	3	3	3	6
Ifugao	1	3	4	2	6
Kalinga	0	4	4	3	7
Mt. Province	0	2	2	4	6
Region 1	**7**	**10**	**17**	**6**	**23**
Ilocos Norte	1	3	4	3	7
Ilocos Sur	1	3	4	2	6
La Union	1	1	2	0	2
Pangasinan	4	3	7	1	8
Region 2	**12**	**24**	**36**	**22**	**58**
Cagayan	3	9	12	8	20
Isabela	7	7	14	5	19
Nueva Vizcaya	2	4	6	5	11
Quirino	0	4	4	4	8
Region 3	**16**	**9**	**25**	**11**	**36**
Aurora	1	1	2	6	8
Bataan	1	1	2	1	3
Bulacan	1	1	2	0	2
Nueva Ecija	5	4	9	0	9
Pampanga	3	0	3	1	4
Tarlac	2	1	3	1	4
Zambales	3	1	4	2	6
Region 4A	**15**	**9**	**24**	**2**	**26**
Batangas	2	1	3	0	3
Cavite	2	0	2	0	2
Laguna	3	1	4	0	4
Quezon	7	6	13	1	14
Rizal	1	1	2	1	3
Sub-total	**53**	**75**	**128**	**63**	**191**

Tract distribution by Region

Region/Province	Old Tracts			New (FL)	Grand Total
	A&D	FL	Sub-total		
Region 4B	**11**	**24**	**35**	**17**	**52**
Marinduque	2	0	2	0	2
Occidental Mindoro	2	4	6	3	9
Oriental Mindoro	1	5	6	1	7
Palawan	5	15	20	12	32
Romblon	1	0	1	1	2
Region 5	**16**	**6**	**22**	**2**	**24**
Albay	3	1	4	1	5
Camarines Norte	2	1	3	0	3
Camarines Sur	5	0	5	0	5
Catanduanes	1	1	2	0	2
Masbate	4	1	5	1	6
Sorsogon	1	2	3	0	3
Region 6	**22**	**5**	**27**	**5**	**32**
Aklan	2	2	4	0	4
Antique	3	1	4	2	6
Capiz	3	0	3	0	3
Guimaras	1	0	1	0	1
Ilo-ilo	5	0	5	0	5
Negros Occidental	8	2	10	3	13
Region 7	**12**	**8**	**20**	**5**	**25**
Bohol	1	3	4	1	5
Cebu	10	0	10	0	10
Negros Oriental	1	5	6	4	10
Region 8	**13**	**13**	**26**	**12**	**38**
Biliran	0	1	1	1	2
Eastern Samar	2	3	5	4	9
Leyte	6	2	8	0	8
Northern Samar	3	0	3	3	6
Samar	2	6	8	4	12
Southern Leyte	0	1	1	0	1
Region 9	**8**	**10**	**18**	**6**	**24**
Zamboanga City	2	0	2	0	2
Zamboanga del Norte	5	5	10	4	14
Zamboanga del Sur	1	2	3	1	4
Zamboanga Sibugay	0	3	3	1	4
Sub-total	**82**	**66**	**148**	**47**	**195**



Tract distribution by Region

Region/Province	Old Tracts			New (FL)	Grand Total
	A&D	FL	Sub-total		
Region 10	**11**	**11**	**22**	**7**	**29**
Bukidnon	6	6	12	4	16
Lanao del Norte	2	3	5	0	5
Misamis Occidental	2	0	2	2	4
Misamis Oriental	1	2	3	1	4
Region 11	**12**	**10**	**22**	**9**	**31**
Compostela Valley	2	4	6	2	8
Davao del Norte	2	1	3	2	5
Davao del Sur	4	3	7	2	9
Davao Oriental	4	2	6	3	9
Region 12	**13**	**13**	**26**	**5**	**31**
North Cotabato					