



PARAMETERS AND INDICATORS FOR MEASURING SUCCESS
OF REFORESTATION PROJECTS IN LUZON, PHILIPPINES

FRAMEWORK ON MONITORING AND EVALUATION OF REFORESTATION PROJECTS (ANNEX E)



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College of Forestry and Natural Resources
University of the Philippines Los Baños

UPLB FOUNDATION INC.

**Parameters and Indicators for Measuring Success of
Reforestation Projects in Luzon, Philippines**

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REFORESTATION PROJECTS**

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INTRODUCTION

Reforestation programs in the Philippines are designed to rehabilitate and restore degraded and denuded forestlands. The country has almost a century of experience in reforestation (Rebugio et. Al. 2007). It has adopted various rehabilitation approaches to arrest growing deforestation and degradation of forestlands. Numerous reforestation programs were implemented in the country with the goal of rehabilitating denuded and degraded forestlands, restoring forest cover, protecting watersheds, providing livelihood to upland communities and mitigating effects of climate change.

Over the past decades, the average forest destruction rate from 1969 to 1973 was 170,000 hectares which gradually slowed down to about 55,000 hectares in the late 70's and early 80's. Between 1980 to 2010, the average deforestation rate is 40,000 ha/year. Several reforestation projects were implemented in different parts of the country in different periods. Reforestation activities during the pre-war period in 1910-1945 were undertaken by the then Bureau of Forestry and covered an area of 26,660 hectares. In 1948-1960, the total area reported was 17,390 hectares. Based on the Philippine Forestry Statistic, the total area reforested from 1910-2010 was 1,983,738 ha. Adding the NGP and ENGP accomplishments from 2011-2021 which is 2,350,623 hectares, the total area reforested is 4,334,371 ha. This achievement could be attributed to a number of factors: increased government funding, multi-agency/sector involvement, policies and programs supporting reforestation and efforts of the private sector.

Considering the reforestation efforts in the country, what is missing is the monitoring and evaluation of these established reforestation projects. Based on the review of the reforestation policies and programs, the existing monitoring and evaluation framework is based on biophysical targets of the projects/programs. The M&E indicators covers physical achievement of the program involving area planted, number of seedlings planted and survival rate and number of employed in the reforestation activities. Considering these M&E indicators, the reforested area needs to be assessed whether they are still existing or have been replaced by another reforestation projects. There is a need to have a comprehensive framework for the M&E of reforestation projects to track progress and success of reforestation projects not only during its implementation but even after the project/program ends.

METHODOLOGY

The identification of the phases, components and indicators in the monitoring and evaluation framework was done through the conduct of primary and secondary data gathering, review of policies and programs and the standards and parameters for measuring success of reforestation projects/programs. A round table discussion with expert's was conducted via zoom platform last May 20, 2021, to solicit information on the content of the M & E framework and their experience on its implementation in the country. Based on the result of the review of literatures and expert's consultations the M&E framework was grouped into three phases the pre-implementation, implementation and post-implementation phases with five components: institutional, biophysical/technical, socio-cultural, economic and environmental components. In each component, indicators were identified either qualitative or quantitative.

The draft framework of standards and parameters for measuring success of reforestation projects and the M & E framework as well as the results of the study were presented to the DENR, FMB and ERDB officials. A national consultation with DENR, LGUs, private sectors, NGOs, POs and academe was conducted last September 30, 2022 for information, comments,

suggestions and validation. The participants' comments and suggestions were considered in finalizing the proposed framework.

COMPONENTS OF THE M&E SYSTEM

The components of a project monitoring and evaluation system are: 1. Clear statements of measurable objectives of the project and its components; 2. A structured set of indicators collecting inputs, process, outputs, outcomes, impact and exogenous factors; 3. Data collection mechanisms capable of recording progress over time, including baselines and means to compare progress and achievements against targets; 4. Where applicable, building on data collection with an evaluation framework and methodology capable of establishing causation (attribution); 5. Clear mechanisms for reporting and use of M&E results in decision making and; and 6. Sustainable organizational arrangements of data collection management, analysis, and reporting.

The first component of the M&E system is the clear statement of measurable objectives for the project and its components. Projects are designed to contribute to long term sectoral development goals, but at the level of project purpose their outcomes should be quite specific and complete. Objectives at the level of project purpose should be specific to the project interventions, realistic in the time frame for the implementation and measurable for evaluation.

On the structured set of indicators covering inputs, process, outputs, outcomes, impact, and exogenous factors, provides an effective structure for planning M&E by defining a hierarchy of objectives for which indicators are required. The indicators provide the qualitative and quantitative detail necessary to monitor and evaluate progress and achievements at all levels of the project hierarchy. The ability to define an indicator and agree with stakeholders and partners a target and the timing for its achievement is a demonstration that project objectives are clearly stated and are understood and supported. Input indicators are quantified, and time-bound statements of the resources financed by the project and are usually monitored by routine accounting and management records. The process indicators monitor the activities completed during implementation and are often specified as milestones or completion of sub-contracted tasks, as set out in time-scaled work schedule. In the output, they monitor the production of goods and delivery of services by the project. They are often evaluated and reported with the use of performance measures based on cost or operational ratios. Outcome indicators are specific to a project's purpose and the logical chain of cause and effect that underlies its design. The achievement of outcomes will depend at least in part on the actions of beneficiaries in responding to project outputs, and indicators will depend on data collected from beneficiaries.

The impact indicators usually refer to medium- or long-term development change to which the project is expected to contribute while the exogenous indicators are those that cover factors outside the control of the project by which might affect its outcome, including risks and the performance of the sector in which the project operates.

The third component of the M&E system is the data collection mechanism capable of recording progress over time, including baselines and means to compare progress and achievements against targets. Within the project M&E systems there will be a need to collect information of the baseline situation and for measurement of change over time for the indicators selected.

Data sources for indicators can be primary or secondary. The reliability and validity of the data must be considered, trying to identify any sources of bias and inaccuracy that may have arisen

during its collection. Project M&E will often make use of a wide range of methods for gathering, analyzing, storing, and presenting data.

Where applicable, building on data collection with an evaluation framework and methodology capable of establishing causation is the fourth component of the M&E system. As part of the growing emphasis on impacts and results, more attention than ever is now being given to rigorous impact evaluation that seek to discover how effective particular types of intervention or policy are at achieving their goals. There are many ways of trying to analyze the impact of an intervention.

The fifth component is the clear mechanism for reporting and use of M&E results in decision-making. There are a range of possible users for the results of monitoring and evaluation of developments projects. These include primary stakeholders, the project management organization, government agencies, other implementing partners and donors. Clear feedback mechanisms are important if the purpose of M&E are to be achieved. Providing the right information in the right place and right form to be used by the right person in decision-making is the ultimate aim.

The last component of the M&E system is the sustainable organizational arrangements for data collection, management, analysis, and reporting. In terms of organizational arrangements, there is no single correct way to build a project M&E system. It is important to recognize that M&E systems are continuous work in progress that must be flexible and adaptable to changing needs and circumstances.

DENR'S MONITORING AND EVALUATION POLICIES AND PROGRAMS

Several policies and programs of the DENR have incorporated the monitoring and evaluation activities as well the tool that will be used and when it will be conducted (Table 1).

Table 1. List of DENR's reforestation policies and programs with monitoring and evaluation component

| POLICY | Party Involved | Tool/ Instrument | M&E | | Period Conducted | | |
|------------------------|--|--|--|--|---------------------------------------|---------------------|------|
| | | | Freq. | Purpose | Pre | Implemen- tation | Post |
| EO 725 (ITPs) | RED | Periodic report | | Monitoring and control | | | ✓ |
| LOI 1260 (ISFP) | Proj. Team (RED, CENRO), SFOs | Project area report | Report every 3 months; yearly | Ensure responsiveness of the program to issues and needs | | | |
| Contract Reforestation | Contract with accredited NGOs | Standards for M&E procedures; Inspection Chart Mapping (ICM) | As per request | Monitor progress of development activities | As per request of concerned PO/family | | |
| DAO 123 (CFP) | Third party (competent independent organization); RED/PENRO/ CENRO | Provided in the Manual of Operations | | Monitoring and process documentation | | | |
| EO 263 (CBFM) | Composite team (RED, PENRO, CENRO, LGU, AOs/NGOs) | No clear prescription on M&E | Monthly | Participatory approach M&E to assess the various issues, problems and constraints; internal M&E system of DENR to assess performance | | ✓ | |
| EO 26/ EO 193 | RED-PENRO-CENRO M&E Team; Composite Team; 3 rd party | NGP Validation Guide | Midterm; Year-end; end of project/ after 5 years | To ensure efficient and effective implementation of NGP | ✓ | ✓ | ✓ |

LOI 1260 (1982) Integrated Social Forestry Program

Under DAO 1988-97, regular monitoring of the of the project areas is conducted to ensure success of the program. The Regional Offices are in-charge of the monitoring, evaluation, and documentation. Reports highlighting problems and opportunities and recommendations are submitted to DENR Central Office to further improve the program. Monitoring was conducted quarterly, and separate annual monitoring and evaluation is also conducted.

Contract Reforestation

DAO 1991-31 provides for the monitoring and evaluation of the program. The monitoring and evaluation are undertaken through contract with accredited NGOs. Activities to be monitored are the construction of infrastructure, seedling production, site preparation, planting/replanting, maintenance and protection, among others. Frequency of inspection and assessment is undertaken pursuant to the work and financial plan prepared by the contractor and approved by the DENR. Inspection chart mapping (ICM) is done at the minimum once during the first two years and twice during the third year. While systematic sampling is done at least twice each year during the 36-month period of contract. The DENR conducts inspections and assess performance in response to progress billing. The primary purpose of M&E implementation by DENR therefore is to determine the amounts due and payable to the contractors.

DENR Administrative Order (DAO) 1989-123: Community Forestry Program (CFP)

A comprehensive resource inventory is a requirement to provide baseline information for monitoring and evaluation. Inventory of forest resources cover 100% of all trees 10cm diameter at breast height (dbh). While timber inventory covers bamboo, minor forest products and commercial palms. As stipulated in DAO 1993-22, all projects are closely monitored to document the experiences and dynamics of project implementation. Monitoring and evaluation is the responsibility of the concerned RED. The work is contracted out to a competent independent organization or entity. In the absence of independent entity, it is done by the regional office with inputs from the concerned PENRO and CENRO.

EO 263 (CBFM)

For M&E, it is participatory in nature to assess the various issues, problems and constraints; internal M&E system of DENR to assess performance. It is monthly conducted by the composite team consisting of members from RED, PENRO, CENRO, LGU, AOs/NGOs. However, there is no clear prescription on the M&E.

EO 26/EO 193 (NGP/eNGP)

Under DMC 2012-01, different regions are directed to Adopt the use of the NGP computer-based reporting system through the NGP website and the NGP geo-tagging M&E system. The 2011 NGP Validation Guide was drafted to serve as guide in the conduct of Regional field validation, assessment and evaluation of the operations and implementation of NGP. The guide also provides the NGP Framework for common understanding and perspective. The implementation mechanism for M&E was stipulated in DMC 2011-01. A composite Monitoring/Inspection Team was created under Special Order No. 2011-792 to validate the performance.

Physical accomplishment reports, quarterly and annually, are required for submission from the PENRO and CENRO with updated geotagged photos and shapefiles of developed NGP plantations as part of the M&E. External evaluation and assessment of the implementation is done every five years. However, an annual review and assessment of this Order by the composite team of representatives from DENR Regional Officer, FMB, and LGUs is also required. In conducting the third-party performance evaluation and assessment, a 5% sampling intensity is used for a one-hectare sampling plot for the selected sites. Selected 1-ha sampling plots are subject to 100% inventory of planted seedlings. Records of the total area planted, spacing, species planted and the health of planted seedlings in each plot also form part of the monitoring (FMB TB No. 23).

The NGP/E-NGP program management, supervision, and monitoring and assessment was through the NGP Executive Committee as provided in DAO 2017-03. DAO 2017-03 further states that a third-party monitoring and evaluation is done through external auditors, priority of which are the State Universities and Colleges (SUCs) and Civil Society Organizations (CSOs). The third-party monitoring review and assessment is done every five (5) years. However, review and assessment of the Program is done by a composite team of representatives from the DENR, CSO and the LGU.

When DAO 2019-03 was issued the overall management and supervision of E-NGP is now under the Office of the Undersecretary for Field Operations which oversees the Regional, Provincial and CENR field offices. Whereas in DAO 2017-03, FMB and BMB provided technical support while ERDB had oversight on bamboo plantations and beach forest and mangrove rehabilitation, DAO 2019-03 designates the FMB as provider of technical support for the Program implementation.

Monitoring and evaluation of NGP sites as discussed earlier is done in three phases: (1) internal validation and assessment of accomplishments of DENR's contracted partners as basis for progress billing scheme; (2) composite team assessment of partners' compliance with the terms and conditions of their MOA as requirement for release of 10% retention fee prior to turn-over of the established project to DENR; and (3) annual and five-year third party assessment of the NGP program as provided in DAO 2019-03.

DENR conducts the internal and composite team assessment of partners' accomplishments during the contract period where most of the PO partners are able to comply with the required performance indicators. However, for the third party evaluation of the Program at the regional and local levels, the DENR and PO respondents are not so aware of the results of the evaluation. In most cases, the issues and concerns that they raised during the evaluation (e.g. 3-year contracts are not enough to maintain and protect the established plantations; perennial problems of wildfires and marginal site conditions causing low survival and growth of established plantations) were already addressed in the recent revisions of guidelines such as DAO 2017-03 and DAO 2019-03. The contract duration was extended to 5 years. The use of pioneer species during year 1 and planting of climax species during year 2 now address the poor growth in marginal areas.

FRAMEWORK FOR MONITORING AND EVALUATION OF REFORESTATION PROJECTS

A Monitoring and Evaluation (M&E) Framework describes the M&E system developed for the project. It includes criteria and indicators that are well defined, simple, measurable, reliable, relevant, and timely (Vallauri et al. 2005). Each indicator should have a direct association with

the output, outcome, or goal of the project. The indicator is measured against a baseline and set target, using qualitative or quantitative methods, and available resources. The criteria and indicators will be used to monitor the progress of the accomplishments of the reforestation projects activities implemented. The M&E framework also identifies the responsible entity for measuring each indicator, the frequency of measurement, and where the results will be reported.

Monitoring is the systematic and regular collection of information from projects which aims to generate lessons from experiences to improve practices and activities; have internal and external accountability of resources used and results obtained; make informed decisions about the future of the projects; and promote empowerment of beneficiaries of the projects. Monitoring checks the progress against plans. It measures the project outputs in terms of quantity and quality of activities implemented; the project outcomes or effects or changes that occurred as a result of the processes inherent in the project; and the impacts external to the project which are broader and long-term effects arising from the activities implemented as well as other environmental factors (sprtanddev.org).

Evaluation is the systematic and objective assessment of a completed project or a phase of an on-going project that has been completed. It appraises data and information to improve the implementation of the project or similar initiatives in the future in terms of its relevance, effectiveness, impact and sustainability. Evaluation draws from the data acquired from the monitoring activities (sportanddev.org). Evaluation may be done internally or externally by independent third parties (geog.ox.ac.uk).

Figure 1 presents the proposed DENRs framework for Monitoring and Evaluation of reforestation projects. The framework was based on the result of the analysis of the secondary data gathered from the different reports and studies, the expert's consultations and key informants interview. For reforestation projects monitoring and evaluation framework, the implementers will have to define the project goals (desired impacts on the

Framework on Monitoring and Evaluation of Reforestation Projects

Goals:
Objectives:
Outputs:

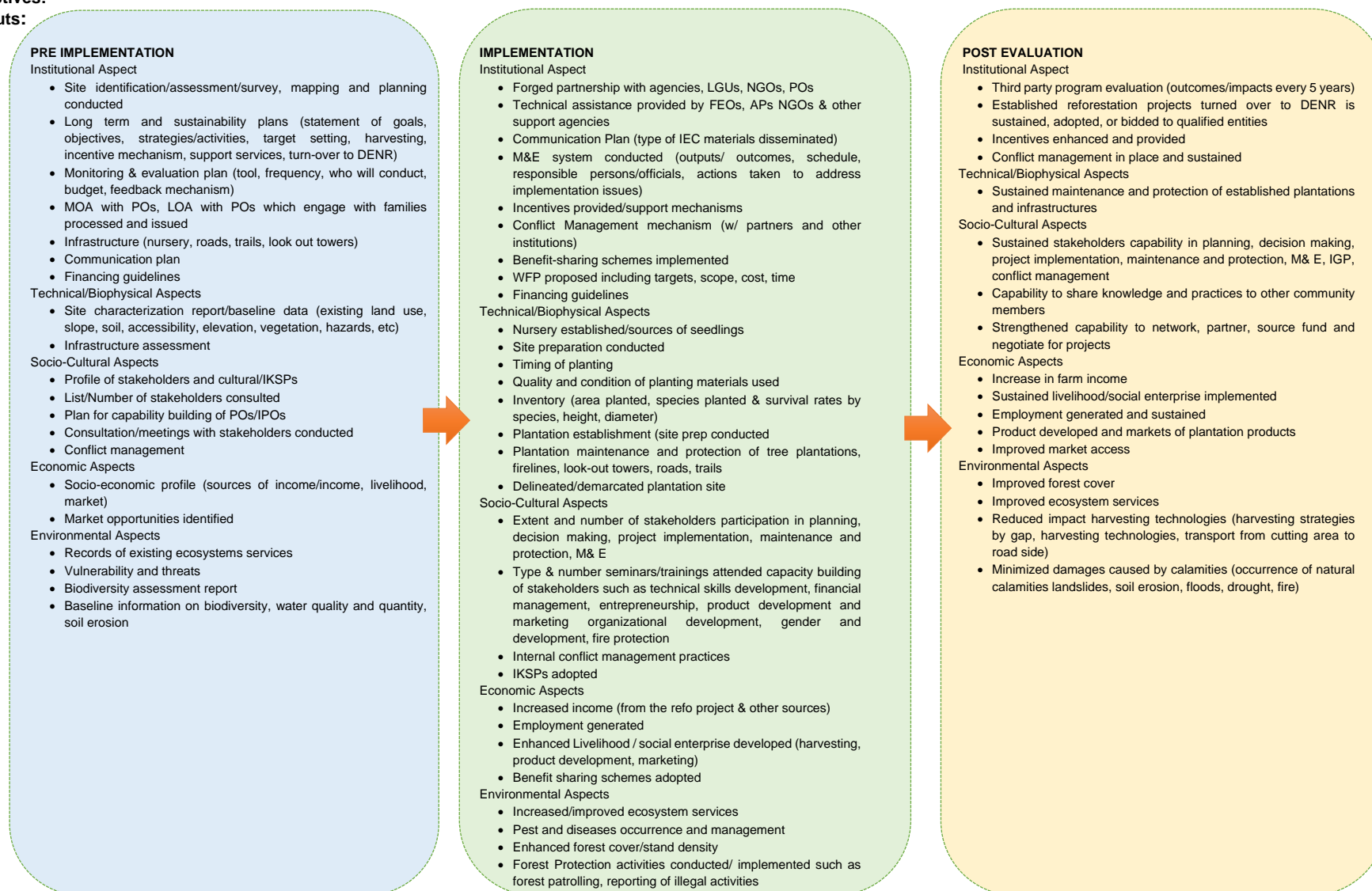


Figure 1. Framework for Monitoring and Evaluation of Reforestation Project

environment and people's lives), objectives (desired outcomes or changes needed to achieve the desired impacts), and outcomes (immediate direct results of the activities that contribute to the objectives). Different agencies/sectors have different reforestation goals/objectives such as: The DENR-FMB have to conduct forest renewal activities in critical denuded areas and identify areas for reforestation, afforestation and agro-forestation, the type of trees to be planted, and suitable period for planting; the National Irrigation Administration (NIA) and National Power Corporation (NPC) have to reforest the immediate vicinity of reservoirs under their jurisdiction and plant trees on watersheds; the LGUs of the Department of Interior Local Government have establish and maintain communal forest, agro-forest, parks, family and/or communal orchards within their jurisdiction, among others.

The specific criteria and indicators to measure the project outputs, outcomes, and impacts of the set objectives and goals are provided in the M & E framework as well as how these indicators will be measured, analyzed (qualitative and quantitative methods), and reported (report template). The frequency of measurement (e.g. annual outputs, mid-term outcomes, end-of-project impacts) and the responsible entity to be involved in the M&E is specified.

The Monitoring and Evaluation Framework is divided into three phases: 1. Pre-Implementation; 2. Implementation and 3. Post-Implementation. Under each phase the criteria and indicators were identified and ensuring that it is well defined, measurable, applicable and relevant based on the stated goals, objectives and outcomes. The components under these three phases are: 1. Institutional; 2. Technical/biophysical; 3. Socio-cultural; 4. Economic; and 5. Environmental components.

In the pre-implementation phase of the proposed monitoring & evaluation framework, the identified indicators for each component are the following: 1. Institutional component- site assessment/identification/survey, mapping, planning conducted, MOA/MOU/LOA issued, long term sustainability plan, monitoring and evaluation plan prepared, communication plan prepared/social mobilization plan, financing guidelines crafted; 2. Bio-physical/technical component- site assessment/characterization reports/baseline data, affirmed/approved management/development/operation plan, infrastructure assessment report; 3. Socio-cultural component- stakeholder analysis/assessment report, capability building/communication plan, consultation meetings conducted; 4. Economic criterion- livelihood data/reports, records on sources of income, market opportunities identified; and 5. Environmental criterion- environmental assessment data/reports i.e. ecosystem services, vulnerabilities and threats, biodiversity.

One of the most important activities in the pre- implementation phase is the survey, mapping and planning (SMP). Site assessment of potential reforestation sites is part of the survey, mapping and planning. The SMP will provide the baseline data for the determination/measurement of the key indicators identified based on the project objectives. The baseline data that will be generated would require survey both qualitative and quantitative data unless existing data source are adequate. The data collection may be continuous or periodic depending on the objectives of the program/project. SMP may also involve the conduct of pre-feasibility studies on the proposed project sites. It includes perimeter survey; sectioning and blocking; monuments and marking of corner posts; contour mapping/slope classification; proposed control and operations maps; benchmark information and demographic and socio-economic data gathering; estimates of

financial/economic rate of return; initial environmental examination; proposed project development plan, schedule and cost estimates, depending on the objectives if it is for production purposes.

Like in the case of reforestation projects with land-use changes or land cover changes, the use of maps, GIS, surveying, inventory should be considered in establishing baseline data. Identification of potential areas through map analysis of maps provided by NAMRIA and other secondary data from other agencies and LGUs. For reforestation programs the priority areas are open/barren, denuded and areas under tenure such as CBFMAs. The POs can identify in their areas that they have not yet been developed, the inaccessible (by distance, elevation, slope) areas that could qualify for The DENR may held consultations with local stakeholders, particularly PO and LGU partners who are knowledgeable about the local situation and environment to validate the areas identified from the maps. Consultations with locals and LGUs could reveal which areas are still not planted and which of those previously planted through past projects have either been burned or already cut and harvested but not replanted.

In terms of planning, it is necessary to plan the organizational structure for M&E specific to the project. The project should be discussed with partners and other stakeholders to understand their responsibilities and information needed from them. Planning should cover the following: staffing levels and types, responsibilities, incentives, training needs, physical resources needed, budget, the relationships with partners and stakeholders. The planning should consider the local community's knowledge in terms of species selection, site selection among others. It is to ensure that choices and decisions are made based on solid analysis and consolidation of experience in several scales.

Social mobilization is an important indicator in the socio-cultural component. The community's goals, needs, aspirations and capacities should be considered and not only the DENR's objectives.

The MOA/MOU/LOA/contract should be prepared stipulating all the roles, responsibilities, accountabilities, targets, financing and other relevant information for both parties. A 5-year reforestation/ rehabilitation/ restoration management plan and annual operations should be prepared which serve as guide for the preparation of individual PO operations plans. The said plans indicate the program goals, objectives, development activities, and targets. LGUs and other government entities also prepare indicative reforestation plans based on their medium or long term goals and objectives and realistic targets are guided by their budget allocations.

In the implementation phase the identified components and indicators are: 1. Institutional components – forged partnerships with agencies/groups, presence of assisting Professionals/NGOs partners/support group agencies; type or kind of technical assistance provided, IEC conducted/disseminated; feedback mechanisms conducted; incentives provided; internal conflict management mechanism implemented; 2. Technical/biophysical component – nursery established/sources of seedlings specified, site preparation activities conducted; timing of planting; quality and condition of planting materials used; survival rates by species recorded; maintenance and protection activities conducted; records of actual area planted; status of stand density and infrastructure established; 3. socio- cultural component - extent and number of

stakeholders participation in planning, decision making, project implementation, maintenance and protection and monitoring and evaluation; and type and number seminars/trainings attended, IKSPs adopted, internal conflict management practiced; 4. Economic component - increased on farm income, employment/jobs generated, enhanced livelihood/social enterprise developed, benefit sharing schemes adopted and identified market availability; and 5. Environmental component – soil fertility improved, forest protection activities implemented such as patrolling, reporting of illegal activities, fire brigade, recorded pest and diseases occurrence

The quality of the seedling/planting material is a very important indicator on the implementation which influence the survival rate and quality of the stand. The survival rate is one of the indicators and it is based on the number of seedlings that survived at the time of inventory/measurement. The survival rate may be as high as 100% and it will decline through time. After planting, the maintenance may include replanting, fertilization, weeding, watering etc. for the socio-economic component, the marginal increase of income is an indicator not for the short-term period only which is while there is reforestation project. The direct benefits to the communities in terms of income, employment and implementing the reforestation project. Incentives provided can take the form of provision of sustainable livelihood, harvesting rights for planted fruit trees and trees, employment generation, and mechanisms for long-term financing. Another indicator is the generation of employment and sustained during the reforestation project implementation, employment was generated during the nursery and plantation establishment such as seedling production, site preparation, transport/handling, actual planting, and maintenance. After these activities, forest protection activities can be sustained. The CBFM reforestation projects have incorporated livelihood components to provide additional income to members. Agroforestry strategy ensures that POs will have something to harvest for the succeeding years.

The conduct of forest protection activities such as fire, grazing, settlement, illegal activities must be visible, timely and effective to prevent the planted trees from illegal cutting and destruction in the future.

For site preparation and plantation establishment, including construction of fire lines, firebreaks are important indicators in the biophysical component. The maintenance and protection activities are set during the reforestation project implementation for the first 3 years.

The conduct of site assessment is important to determine the sustainability of the areas intended for restoration and rehabilitation. Site assessment will cover the bio-physical, socio-cultural and environmental components.

Capacity building like training, education, information or awareness campaign is critical and important in skills enhancement of the partners, local communities and stakeholders. The POs involved in the reforestation projects have received various skills training related to nursery and plantation management, product development and marketing, agroforestry, among others. They have attended seminars and orientations to enhance their knowledge about forest restoration/rehabilitation and forest conservation. These activities are important in building their capacities and help them to become active partners in forest development.

Infrastructure established and developed like roads are important to success, particularly where reforestation are too far/not accessible in terms of plantation maintenance, handling of seedlings

and even in harvesting or transporting to markets. Accessibility of project sites is an essential indicator in the M & E and success of reforestation projects. Some of the identified problems in reforestation accessibility the following: steeply sloping areas are often highly eroded and difficult to reforest; distant areas in higher elevations with poor accessibility pose a challenge to local POs as well as DENR monitoring teams; and overall costs of developing these marginal areas in higher elevations with steep slopes along the way naturally increase with every km as it takes more time (hours and person-days) to haul planting materials and conduct maintenance and protection activities as well as validation and monitoring activities.

Technical support/assistance provided is one of the indicators for monitoring and evaluation. There is a need to specify the type of technical assistance provided by DENR and other sector to determine reforestation success. Technical assistance maybe in the form of reforestation techniques, community organizing, conflict resolution and other management schemes.

In the post implementation phase the identified indicators for each component are the following:

1. Institutional component – third party program implementation conducted every 5 years; report/record of established reforestation areas turnover to DENR, list and status incentives provided, tenurial instrument issued; conflict management in placed/sustained;
2. Technical/biophysical component - increased area planted; enhanced stand density; improved tree growth performance; forest protection activities implemented; enhanced productivity of the area; established infrastructure maintained;
3. Socio-cultural component – sustained stakeholders capability stakeholders participation in planning, decision making, project implementation, maintenance and protection and monitoring and evaluation; capacitation to share knowledge to other stakeholders/community members, trainings and seminars attended/sustained, strengthened capability to network, source funds and negotiate for projects;
4. Economic component - increased on farm income, sustained livelihood/social enterprise, number of employment generated and sustained; and
5. Environmental component – improved/enhanced forest over, improved ecosystem services in terms of soil fertility, water quality and quantity, carbon sequestration, climate amelioration, reduced impact harvesting technologies, minimized damages caused by calamities such as landslides, soil erosion, floods, drought, fire and forest protection activities implemented such as patrolling, bantay gubat, etc.

In the post implementation, the quantitative and qualitative environmental impacts can be monitored and evaluated. The following environmental indicators are air quality, water quality, tree health, soils and the understory and wildlife habitats and populations, biodiversity and carbon mitigation. It can include other impacts such as landslide, soil erosion, or preservation of timber reserves.

The density of trees that will provide water infiltration in the soil will result to increase streamflow in the watersheds. The planted trees will provide a cooler environment, recharging water to creeks, minimizing soil erosion, recharging soil fertility and in bringing back wildlife to the reforested areas.

Harvesting is one of the indicators in the bio-physical component. The planted trees may be harvested to meet the demand for wood and as an alternative source of income.

Forest protection of established plantations should be implemented/enhanced to ensure its sustainability and intended long-term outcomes. This indicator suggests that fire, weed control and grazing management must be dealt with and recorded for the reforestation project to succeed.

The community's capability is sustained/improved which makes them participate in project planning, decision making and implementation.

The short- and long-term livelihoods needs to be installed and considered to motivate the local communities in protecting the reforestation projects.

The proposed M&E system of DENR for the short, medium and long term are designed in such a way that it does not only measure physical accomplishments of their partners but also to assess the field offices' capacity to implement the Program over the pre-implementation, implementation and post-implementation phases. The short and medium term evaluation should have addressed the issues, problems, concerns and recommendations raised by the stakeholders/ key informants about the implementation activities of the reforestation projects/programs.

Monitoring and Evaluation could be done by DENR field personnel to conduct field measurements and validate the reports submitted by reforestation project partners (i.e. specific tenure holders or contractors) to the DENR offices. The monitoring reports are then consolidated at various field offices and submitted to higher levels such as DENRO, RED, and DENR central office for processing, analysis, and inputting into a reforestation database. The regular monitoring reports will be analyzed to generate issues, problems, lessons, and best practices to improve or enhance project implementation activities and processes. The data and information from monitoring activities will then be used in internal or external project evaluation, which may be done during (mid-term) or at the end of project implementation.

The users of the M&E tool should keep in mind that this document which will provide a guide in determining the progress of the reforestation program accomplishments through time. In addition, M&E framework may be revised/changed depending on the goal or objectives of the program/project.

ISSUES AND CONCERNS

Monitoring of reforestation projects continues to be conducted on the reforestation sites according to CBFM POs. The DENR validates the accomplishments reported by the POs. For NGP, monitoring and evaluation is conducted at the end of the contract period to determine if the POs and other implementors have accomplished and attained its targets. The indicators monitored are survival rate, actual area planted. There is no comprehensive M & E tool used.

According to the key informants, reforestation projects have improved the ecosystem services as observed by the respondents in terms of water quality and quantity, climate amelioration, biodiversity. and Carbon stocks assessment but they don't have any basis due to lack of baseline data or information.

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