

# **EX-POST EVALUATION REPORT**

**ITTO Project PD 34/99 Rev.2 (I)**

## **Development and Implementation of Stress Grading Rules for Tropical Timber in the Philippines (The Philippines)**

Prepared for the ITTO

by

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## **Acronyms**

ASEP	:	Association of Structural Engineers of the Philippines
BPS	:	Bureau of Product Standards
CIAP	:	Construction Industry Authority of the Philippines
CREBA	:	Chamber of Real Estate and Builders' Associations, Inc.
FBIAC	:	Forest Based Industry Advisory Committee
FFTC	:	FPRDI Furniture Testing Center
FPRDI	:	Forest Products Research and Development Institute, Department of Science and Technology
ITTC	:	International Tropical Timber Council
ITTO	:	International Tropical Timber Organization
LFM	:	Logical Framework Matrix
MGL	:	Machine Graded Lumber
NSCP	:	National Structural Code of the Philippines
PDCB	:	Philippine Domestic Construction Board
PICE	:	Philippine Institute of Civil Engineers
PSC	:	Project Steering Committee
PWPA	:	Philippine Wood Producers Association
UPLB	:	University of the Philippines at Los Banos

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## **Executive Summary**

1. This report presents the results of the ex-post evaluation of Project PD 34/99 Rev.2 (I) "Development and Implementation of Stress Grading Rules for Tropical Timber in the Philippines". Dr. Hiras P. Sidabutar was tasked by ITTO to conduct the evaluation.

### **2. Rationale of the Ex-post Evaluation**

- The Committees on Economic Information and Market Intelligence, and Forest Industry decided at their Thirty-seventh Sessions in November 2005 that an ex-post evaluation for Project PD 34/99 Rev.2 (I) should be carried out to establish how well the project served its purposes and to draw up recommendations for future action.
- The primary purpose of the ex-post evaluation is to provide an in-depth diagnosis of the project as to point out the successful and unsuccessful outcomes, the reasons for successes and failures, and the contributions of the project towards the achievement of ITTO's Objective 2000, and to draw lessons that can be used to improve similar projects in the future.

### **3. Project Identification and Context**

- Project budget:

Government of the Philippines : US\$ 521,195

ITTO (Donors: Japan, Switzerland and USA) : US\$ 616,257

Total : US\$ 1,137,452

- Duration : 30 months plus 34 months of extension
- The project was consistent with five particular objectives of ITTA 1994 and was related and strongly linked with Goals 1, 2 and 3 of the Forest Industry under the ITTO Libreville Action Plan.

### **4. Evaluation, Scope, Focus and Approach**

- The main purpose of the ex-post evaluation is to learn lessons and draw conclusions for future projects; to establish the extent to which the results in terms of outputs, achieved objectives, impact and sustainability of the project intervention have been achieved; and draw conclusions and recommendations for similar interventions in the future.
- The evaluation involved the review of project document, YPOs, minutes of PSC meetings, bi-annual progress reports, technical and financial reports, completion report and other relevant technical documents as well as meeting and discussion with the former project key personnel, national expert and Officials of FPRDI, the Executing Agency.
- A visit was paid to Central Lumber Corporation in Cebu City to obtain first hand information on the MGL technologies and market potential for MGL.

- The key stages of the evaluation include clarification and analysis of the project design, assessment of performance by analyzing achievements against the LFM, assessing actual intended situation, studying the work plans and associated budgets against actual implementation and spending and assessing impact and sustainability of the project.

## **5. Origin of the Project**

The project was built on completed pre-project which revealed that: i) lumber continuous to be an acceptable building material for structural components in the Philippines; ii) the mixed species composition, mostly imported, in the current market coupled with the positive trend in the lumber supply and demand in the long-run show favorable prospects for lumber stress grading; iii) when a mechanized stress grading method with visual override is integrated as an added activity in the sawmill, preliminary estimates show that the net profit of producers will remain positive; and iv) the development and implementation of stress grading rules in the Philippines will be a long process, hence initiatives should be placed in motion immediately.

## **6. Development Objective**

As defined in the project document, the development objective was “to develop and implement stress grading rules for timber used for construction in the Philippines”.

## **7. Specific Objectives**

Originally, four specific objectives were defined; the 33<sup>rd</sup> ITTC Council meeting in November 2002 approved an additional specific objective to conduct an international workshop on the Development and Implementation of Stress Grading Rules for Tropical Timber.

## **8. Findings**

- Planned outputs had all been delivered. Therefore, the specific objectives had also been achieved. The development objective should also have been achieved as it was defined similarly to Specific Objective 1.
- The project design was weak as the proposal was formulated without full adherence to the ITTO Manual for project formulation. The problem analysis was inadequate and resulted in a weak vertical logic and thus LFM.
- Effects of the project intervention include raised awareness of beneficiaries of MGL production technologies, and trained graders and inspectors of MGL. Impact of project intervention has not materialized yet as expected as evident by the absence of investment in MGL production primarily caused by the undeveloped market for MGL.
- Market for MGL is not developing due to the strong penetration of substitutes and the absence of legal basis for effecting policy measures requiring use of MGL in structural applications.
- The once raised awareness of MGL technologies may fade away with the interruption of marketing campaign activities.

- Technologies of MGL had been effectively transferred to target groups through various means including dissemination of information materials, press and radio releases, technological presentations to Trade Fairs, government officials, private companies, academes, and professional organizations.
- The project required a 34-month extension in time without additional funding due mainly to the much longer time than expected to complete the market studies and stress grade testing.
- Sustainability of the project is under question as no institutional and financial arrangements were made prior to completing the project causing interruption of critical such activities as MGL market campaign and process of endorsement of MGL standards and their adoption as national structural code.
- Despite the extension in time, the project was implemented well due to the timely procured inputs, effective management of operations, prudent financial management and full support by beneficiaries.
- One of the key success factors of project implementation was the involvement of stakeholders in implementing the project in various such forms as respondents, resource persons, cooperators in piloting MGL production, trainees and producers of specimens for testing.

## **9. Lessons Learned**

- i. The project was built on completed pre-project. During implementation of the pre-project, the Executing Agency conducted sufficient stakeholder consultation. Consequently, aspiration of the beneficiaries was well captured in the formulated project of MGL. This had created ownership thus the full support of the beneficiaries to the implementation of the project.
- ii. Formulation of the project did not fully adhere to the ITTO Manual for project formulation and resulted in the weak vertical logic of the project which further manifested in the weak LFM that could not be fully used in assessing achievement accurately especially at the level of objective. In this case, the intended situation after project completion as presented in the project document could be a useful tool for assessment, qualitatively. Quality of the assessment would be highly dependent on the nature of presentation of the intended situation.
- iii. While the project was weak in its design, it was satisfactorily implemented and completed by delivering all its planned outputs and achieving its overall specific objectives. The key success factors include timely supply of inputs in terms of quantity and quality, effective operational management, prudent financial management, and full support by beneficiaries.
- iv. The project had generated impact on the beneficiaries by creating awareness of the presence of MGL technologies. This impact, however, is less sustainable. The

absence of clear exit strategy may jeopardize sustainability of a project's impact. Clearly defining an exit strategy establishing institutional arrangements and financial sources for implementation of critical activities at least one year prior to completing the project is highly advisable. In this manner funding could be secured through appropriation of national budget under established procedures on national budget planning.

- v. The impact is also less sustainable due to the lack of interest to invest in MGL production brought about by the undeveloped market for MGL resulting from penetration of market by substitutes for construction materials and from the absence of legal framework for use of MGL in the construction sector.
- vi. The project was planned for 30 months and extended for 34 months. The time needed to conduct market studies involving numerous respondents and to complete stress grade testing in cooperation with saw millers was much longer than expected. Careful planning by project proponent needs to be exercised when dealing with implementation of activities requiring participation and support by outsiders.

## **10. Conclusions**

- i. Planned outputs and objectives as defined in the project document had all been achieved. This was evident by comparing the outputs and objectives listed in both the project document and completion report. However, some outputs and specific objectives were, in fact, the same to each other.
- ii. The project proposal was formulated without full adherence to the ITTO Manual; problem identification and analysis were performed unsatisfactorily and resulted in a weak vertical logic that was manifested in the LFM.
- iii. The LFM presented in the project document could not be used fully and effectively in measuring achievements of the project due to the unquantifiable/unverifiable nature of some of the indicators at both the output and objective levels.
- iv. The project was relevant to the need of construction sector of the Philippines as it was intended to improve efficiency of lumber use in the construction sector. Impact of the project has not fully materialized after the project completed more than four years as evident by the fact that no investment had taken place in commercial production of MGL.
- v. Implementation of the activities on marketing program for MGL had been effective in transferring the MGL technology to target groups through dissemination of information materials, presentations, training, pilot testing, etc.

- vi. The much longer time than expected to conclude market studies and stress grade testing and conduct of additional activities on international workshop on MGL had required the project for a 34-month extension in time.
- vii. Sustainability of the project is under question mainly due to the undeveloped market and the absence of compulsory legal framework for the production and use of MGL.
- viii. The project was implemented satisfactorily due mainly to the timely supply of inputs in terms of quantity and quality, able operational management, prudent financial management and full support by beneficiaries. Beneficiaries of the project were involved in the formulation as well as implementation stages which had contributed to the successful completion of the project. Effective documentation of activities and results of the project facilitated effective monitoring exercise both internally and externally and contributed significantly to the successful completion of the project.

## **11. Recommendations**

- i. To facilitate comparison between planned and realized objectives and outputs, they must be properly defined consistent with the key problem intended to address and explicitly reflect its effect as well as main causes.
- ii. Strict adherence to existing ITTO Manual for project formulation is needed to ensure a strong vertical logic of project design and to facilitate formulation of a strong LFM; the National Clearing House and ITTO Expert Panel are to ensure this adherence is observed by proponent of ITTO project proposal.
- iii. Indicators must be defined in such a way that they are specific, measurable, appropriate, realistic and time bound. In this fashion, the indicators will be useful for measuring achievements. The National Clearing House and ITTO Expert Panel are to see to it that all indicators are defined in a proper manner.
- iv. To generate and sustain impact of the project, market for MGL must be developed through provision of legal framework for production and use of MGL and through massive and continued market campaign. The Executing Agency should pay greater attention to this issue by securing the needed resources in the near future.
- v. Implementation of the activities on marketing program of MGL should be continued in order to preserve and develop the awareness of beneficiaries that had been created by the project. The Executing Agency should secure the needed resources to continue implementing the activities.
- vi. To ensure timely completion of a project, careful planning is necessary when dealing with implementation of activities involving outside parties.
- vii. Sustainability of the project could only be preserved by developing market through massive and uninterrupted campaign and by compulsory adoption of MGL standards



in construction applications. In order to sustain impact of a project, an exit strategy establishing institutional and financial arrangements for implementing crucial activities after project completion must be clearly defined at least one year prior to completing a project.

- viii. To ensure successful implementation of a project, inputs and operations must be managed wisely and effectively while support by beneficiaries is indispensable. Stakeholder analysis a crucial step in project designing and stakeholder involvement in project implementation is required as appropriate. Mechanism for involving stakeholder in project implementation shall be made clear in the project design by any project proponent.

## **1. INTRODUCTION**

### **1.1. Rationale of the Ex-post Evaluation**

The Committee on Economic Information and Market Intelligence and the Committee on Forest Industry, at their Thirty-seventh Session in November 2005, decided that an ex-post evaluation for Project PD 34/99 Rev.2 (I) should be carried out to establish how well the project served its purposes and to draw up recommendations for future action. The decision of the Committees was based on the Council Decision ITTC (XXVIII)/20 of 30 May 2000 which specifies the criteria for selection of projects to be ex-post evaluated. The primary purpose of the ex-post evaluation is to provide an in-depth diagnosis of the project as to point out the successful and unsuccessful outcomes, the reasons for successes and failures, and the contribution of the project towards the achievement of ITTO's Objectives 2000, and to draw lessons that can be used to improve similar projects in the future. Annex 1 sets out the Terms of Reference for the ex-post evaluation.

### **1.2. Project Identification and Context**

Project serial number : PD 34/99 Rev.2 (I)  
Project title : Development and Implementation of Stress Grading  
Rules for Tropical Timber in the Philippines  
Host country : The Government of The Philippines (GOP)  
Budget : Total US\$ 1,137,452  
ITTO US\$ 616,257 (Donors: Japan, Switzerland  
and USA)  
GOP US\$ 521,195  
Duration : 64 months; originally 30 months, extended for 34 months

The Specific Objectives of the project were:

- (i) To develop and implement stress grading rules and relevant standards for tropical hardwoods based on the existing technology infrastructure.
- (ii) To establish and implement a training program for trainers to promote the production and quality assurance of stress graded tropical hardwoods.
- (iii) To establish and implement the basis for a marketing program to promote the use of stress graded tropical hardwoods for domestic and export markets.
- (iv) To interact with appropriate regulatory bodies toward the adoption and implementation of appropriate codes and standards regarding the production, quality assurance, and use of stress-graded tropical hardwoods.

- (v) To promote global harmonization of lumber stress grading rules by encouraging other ITTO member countries to initiate similar work in their respective countries (additional objective based on the approved amendment in November 2002 during the 33<sup>rd</sup> ITTC Council meeting in Yokohama).

Given the Specific Objectives, the project was consistent with the following objectives of ITTA 1994:

- To encourage more and further processing of tropical timber in producer countries. This will be achieved through implementation of stress grading rules. More consistent quality of timber due to grading will increase confidence in timber used for construction.
- To provide an effective framework for co-operation and consultation on all relevant aspects of the tropical timber economy. This will be achieved through interaction with regulatory agencies responsible for codes and standards governing wood products; production facilities which will manufacture and grade timber for construction applications; architects and engineers who will specify and design with stress-graded timber; researchers involved with timber engineering; outlets for sales of stress-graded timber, and builders who will use the timber.
- To encourage national policies that aim at sustainable use and conservation of tropical forests and their genetic resources. This will be achieved by introducing grading rules targeted towards more efficient use of the timber resource. Grading reduces the need for highly conservative use of timber by better defining the size of timbers required for a particular application.
- To help expand and diversify international trade in tropical timber and improve structural conditions in its market. Stress-graded timber represents additional value for the raw material. The high strength and durability of several species used for construction may enhance export markets for tropical timber for construction applications.
- To help research and development that will improve forest management and wood use. This will be achieved through identification of areas which additional research is needed to further improve acceptance of timber used for construction.

The project was also related and strongly linked to the ITTO Libreville Action Plan especially to the Forest Industry's goals and actions as follows:

**Goal 1: Promote increased and further processing of tropical timber from sustainable sources.**

- Action 3: Assist in the promotion and transfer of new and/or improved techniques and technologies.
- Action 5: Assist human resource development and institutional strengthening by designing and conducting regional and international events such as specialist workshops and seminars and by the provision of fellowships.
- Action 6 : Encourage and assist Members, as appropriate to:
  - Promote investment in timber processing industry by taking steps to make investment in forest industry attractive to private capital.
  - Formulate research and development proposals which assist with the piloting and commercialization of new processing and manufacturing technologies.
  - Organize workshops/seminars on the use of new and/or improved techniques, technology and the development, testing and adoption of guidelines.

**Goal 2: Improve marketing and standardization of tropical timber exports.**

- Action 3: Encourage and assist Members, as appropriate, to:
  - Prepare and implement Research and Development projects covering marketing trials, marketing methods and opportunities.
  - Participate in international standards activities related to forest products.

**Goal 3: Improve efficiency of processing of tropical timber from sustainable sources.**

- Action 4: Assist in the promotion, transfer and adoption of new and/or improved techniques and technologies through publications and other media, workshops, seminars and fellowships.
- Action 5: Encourage and assist Members, as appropriate, to formulate research and development proposals that assist with the piloting and commercialization of improved and/or innovative utilization

methodologies, including reduction of losses and increased use of residues, developed from laboratory based studies on improved utilization.

## **2. EVALUATION SCOPE, FOCUS AND APPROACH**

### **2.1. Evaluation Scope and Focus**

The main purpose of the ex-post evaluation is to learn lessons and draw conclusions for future projects. The ex-post evaluation should establish the extent to which the results, in terms of Outputs, achieved Objectives, impact and sustainability of the Project intervention have been achieved and draw conclusions and recommendations for similar interventions in the future.

The author assessed all aspects of Project PD 34/99 Rev.2 (I) from its inception to the situation after its completion covering administrative and financial matters, organization, communication, consultation and cooperation, technical matters, effectiveness and impact, and relevance to ITTO.

The evaluation placed particular emphasis on:

- The utilization of the developed stress graded timber in construction applications;
- The integration of the developed stress graded timber in the lumber production of both local and imported wood species;
- The effectiveness of the established training program for trainers to promote the production and quality assurance of stress graded tropical hardwoods;
- The relevance of the financial and economic studies on lumber stress grading for various size sawmills;
- Marketing assessment and strategies; and
- Marketing program on the use of stress graded tropical timber for domestic and export markets.

### **2.2. Evaluation Approach**

The evaluation involved:

- the review of project document, YPOs, minutes of the Project Technical Committee meetings, bi-annual Progress Reports, Technical Report, Financial Report, Completion Report and other relevant documents;

- meeting and discussion with the Project Leader and National Expert of the project at the Forest Products Research and Development Institute (FPRDI) at Los Banos, Laguna; and
- visit to Cebu City to interview one of the primary beneficiaries of the project which was a lumber producer and trader that provided an opportunity for MGL product launching to potential buyers.

The key stages of the evaluation include:

- i) Clarification and analysis of the project design
  - This was carried out through discussion with the Executing Agency, especially with Project Key Personnel. It was fortunate for the author that both the Project Leader and National Expert were available and assisted in the evaluation.
  - The project design was assessed using the ITTO Manual for Project Formulation first edition, as the framework with special attention to the project elements and logical framework.
- ii) Project performance was assessed by:
  - Analyzing achieved Objectives and Outputs in light of the logical framework matrix (LFM).
  - Assessing the intended situation expected to prevail after project completion as presented in project document.
  - Studying the project work plans and associated budgets against actual implementation and spending.
  - Assessing impact and sustainability of the project through visit to one of the beneficiaries.

Dr. Hiras Sidabutar, whose CV appears as Annex 6, was tasked by ITTO to carry out the ex-post evaluation. One senior staff of FPRDI, Dr. Rico J. Cabangon was assigned by the Executing Agency to fully assist in the evaluation at the institution's own costs.

### **3. PROJECT FACTS**

#### **3.1. Origin of the Project**

The Project built on findings of completed Pre-project PPD 12/96 Rev.2 (M,I) "Development and Implementation of Stress Grading Rules for Tropical Timber in the Philippines" which revealed the following:

- Lumber continuous to be an acceptable building material for structural components, specifically low-rise (maximum height of 10 m) residential, school buildings, health centers, assembly halls and other public utility building. The demand for quality wood for light frame and/or as stiffener in panelized construction in mass housing projects establishes the need to make quality lumber available for building constructors;
- The mixed species composition, mostly imported, in the current market coupled with the positive trend in the lumber supply and demand in the long run show favorable prospects for lumber stress grading;
- When a mechanized stress grading method with visual override is integrated as an added activity in the saw mill, preliminary estimates show that the net profit of producers will remain positive. If buyers/consumers would be willing to pay a premium price for graded lumber, sellers/producers will be able to maintain their profit position before adoption of stress grading. On the part of investors and/or producers, stress grading will be adopted as long as incremental profit associated with stress grading remains positive; and
- The development and implementation of stress grading rules in the Philippines will be a long process; hence initiatives should be placed in motion immediately. Evidently, the biggest marketing constraint of stress graded lumber is the low level of awareness of producers, traders and consumers. Massive information campaigns should involve linkages with all concerned sectors, meetings, dialogues, mass media exposure, trade fair, communication materials production and dissemination and academic curriculum integration.

### **3.2. Development Objective**

As defined in the project document, the objective of the project was to develop and implement stress grading rules for timber used for construction in the Philippines.

### **3.3. Main Problems to be Addressed**

The development and implementation of an objective lumber grading system and availability of machine graded lumber (MGL) in the market should contribute to the efficient utilization of lumber in the construction sector and conservation of timber resources. However, producing MGL cannot be initiated in the absence of stress grading system, the lack of professionals on lumber grading, undeveloped market for MGL and the weak legal framework for the production and use of MGL nationwide. These were the main problems the project intended to address. The corresponding specific objectives of the project were those as defined in the next section.

### **3.4. Specific Objectives and Outputs**

Four Specific Objectives and seven Outputs were defined as follows:

Specific Objective 1 : To develop and implement stress grading rules and relevant standards for tropical hardwoods based on the existing technology infrastructure.

- Output 1.1 : Stress Grading System for tropical timber (10 activities).
- Output 1.2 : Design manual for proto-type low-rise buildings using stress graded lumber (2 activities).

Specific Objective 2 : To establish and implement a training program for trainers to promote the production and quality assurance of stress graded tropical hardwoods.

- Output 2.1 : Training program on quality assurance of stress-graded lumber for trainers and inspectors (4 activities).

Specific Objective 3 : To establish and implement the basis for a marketing program to promote the use of stress graded tropical hardwoods for domestic and export markets.

- Output 3.1 : Financial and economic studies on lumber stress grading for various sizes sawmills (3 activities).
- Output 3.2 : Marketing assessment (4 activities).
- Output 3.3 : Marketing program on the use of stress graded tropical timber for domestic and export markets (3 activities).



Specific Objective 4 : To interact with appropriate regulatory bodies toward the adoption and implementation of appropriate codes and standards regarding the production, quality assurance, and use of stress-graded tropical hardwoods.

- Output 4.1 : Integration of standards on production, quality assurance, and use of stress-graded timber and subsequent implementation (6 activities).

Specific Objective 5 : To promote global harmonization of lumber stress grading rules by encouraging other ITTO member countries to initiate similar work in their respective countries (additional objective based on the approved amendment in November 2002 during the 33<sup>rd</sup> ITTC Council meeting in Yokohama).

### **3.5. Project Rationale**

Most of the lumber commercially available in the Philippines consisted of imported and local plantation species whose quality based on strength property could not be determined using the current lumber grading system. Since most of lumber species being traded were of unknown species, end users did not have confidence in using wood for structural purposes. Without any stamp of quality, traded lumber was considered inferior to alternative construction materials such as steel and cement.

The inapplicability of the current lumber grading system, with more imported species coming into the country and increasing availability of local plantation species whose properties were not generally known, there was a pressing need to develop an objective and effective grading system that would determine the quality of lumber for construction purposes.

The development and implementation of an objective lumber grading system and availability of machine graded lumber (MGL) in the market should thus contribute to the efficient utilization and conservation of timber resources. At the same time, this would provide incentives for more plantation development and improved management of natural forest. This would pave the way for various construction applications using MGL – based pre-fabricated and engineered structural components such as laminated and built-up columns, long span and curved or arched beams.

## **4. FINDINGS AND LESSONS LEARNED**

### **4.1. Findings**

#### **a. Realized versus Planned Objectives and Outputs**

Realized Outputs of the project were:

- i. A system for machine stress grading tropical timber including the criteria, mechanical grading rules and standards and visual override developed;
- ii. Builder's manual and design manual, including software, for buildings using machine-graded lumber (MGL) developed. The Manual was used in fabricating wooden trusses from MGL used in the Multi-purposes Day Center of Barangay Batong Malake, Los Banos, Laguna, a cooperative project between the local government of Los Banos and FPRDI;
- iii. A training program, including the necessary training manual and modules, for trainers and inspectors on the production of quality assured lumber. The program was used in the training of five trainers and five inspectors;
- iv. Economic studies conducted on timber marketing system and trade, price structure, current sorting and grading systems for lumber, financial feasibility of producing MGL and cost comparison of prototypes using MGL and alternative materials;
- v. Market assessment on lumber demand and supply undertaken, market barriers in introducing MGL identified, possible market entry modes and strategies and marketing program for MGL developed;
- vi. Information and promotion materials for MGL developed, printed and disseminated;
- vii. Commercialization of MGL with industry partners piloted;
- viii. Draft standards on quality assured MGL submitted to the Bureau of Product Standards (BPS) for endorsement (Technical Document);
- ix. Section on MGL as an alternative grading method approved for inclusion in the National Structural Code of the Philippines (Official correspondence);
- x. Machine grading system disseminated to various regulatory bodies and professional organizations like the Association of Structural Engineers of the Philippines (ASEP), Construction Industry Authority of the Philippines (CIAP), Philippine Institute of Civil Engineers (PICE), Bureau of Product Standards (BPS), Philippine Wood Producers Association (PWPA), etc; and
- xi. International Workshop on the Development and Implementation of Stress Grading Rules for Tropical Timber: The Philippine Experience, conducted.

The above listed Outputs i through vi are reported in the Final Technical Report while the rest were available in separate individual technical documents.

Planned Outputs of the project as appeared in the project document were:

- Output 1.1 : Stress grading system for tropical timber
- Output 1.2 : Design manual for prototype low-rise buildings using stress graded lumber
- Output 2.1 : Training program for trainers and inspectors
- Output 3.1 : Financial and economic studies on lumber stress grading for various size sawmills
- Output 3.2 : Marketing assessment and strategies
- Output 3.3 : Marketing program on the use of stress graded tropical timber for domestic and export markets
- Output 4.1 : Codes, standards on production, quality assurance and use of stress-graded lumber.

The above lists of realized and planned Outputs clearly indicate that planned Outputs of the project had all been delivered. In fact, Outputs vii and ix through xi were not planned but were the results of individual activities under different Specific Objectives. The realized outputs also had furnished all five specific objectives as defined in the project document noting that certain specific objectives were overlapped with the outputs as will be discussed in the next section.

b. Project Design

The project proposal was developed using the ITTO Manual for project formulation, first edition, published in 1992. According to the Manual, if planned outputs are fully achieved and the assumptions fulfilled, then the corresponding specific objective can be judged achieved. In accordance with the Manual, the logical framework matrix (LFM) is to be employed when measuring the degree to which outputs and objectives have actually been achieved. The indicators should be a useful tool for this purpose.

The LFM presented in the project document shows a number of weaknesses as follows:

- Indicators of the development objective were not measurable thus could not be used as a measure of achievement;
- Indicators of the Specific Objective 1 were not measurable thus could not measure achievement;
- Indicator of Specific Objective 2 was measurable although lacked time bound. This objective had been achieved;

- Indicators of Specific Objective 3 and 4 lacked of clarity and could not be used to correctly measure achievement; and
- At the output level, indicators of Outputs 1.2 , 2.1 were measurable. Available means of verification indicated that these outputs had indeed been achieved. Achievement of Output 1.1, 3.1, 3.2, 3.3 and 4.1 could not be fully assessed clearly as the indicators lacked clarity.

As the LFM could not be fully utilized for measuring achievement at the output and objective levels, attempt was made to use the intended situation after project completion as the benchmark of overall achievement. The situation expected to prevail after project completion, as elaborated in the project document, was:

- i. Stress graded timber will be available for use in construction applications in the Philippines and stress grading will be integrated in the lumber production of both local and imported wood species;
- ii. The training program would produce individuals who will serve as trainers of lumber graders in production facilities and training will be an on-going activity after the completion of the ITTO project; and
- iii. BPS and PDCB in cooperation with the FPRDI shall continue to monitor the implementation of stress grading rules from production to marketing to utilization.

Comparing the realized outputs and specific objectives against the above listed intended situations, this evaluation confirmed that the intended situation had been achieved partially: a) the stress grading rules had been developed and used only on a pilot scale; b) the training on lumber grading had not become an on-going activity; and c) developed stress grading rules had not yet in the operational stage.

The vertical logic and horizontal logic of a project are tied to one another. While the vertical logic shows the project elements and their interdependence, the horizontal logic defines the indicators, means of verification and assumptions for individual elements particularly for outputs and objectives. Consequently, weakness of the project elements, if any, will inevitably be manifested in the horizontal logic. In case an output is inappropriately defined, its indicator will certainly capture the weakness.

As was indicated earlier, the LFM of the project contained weaknesses that most likely were the result of inappropriate definition of the project elements. This

was so because the project was formulated with a lack of adherence to the ITTO Manual. Examples of this lack of adherence are:

- Four specific objectives were defined whilst the Manual limited the number of specific objective to only two at the maximum; one unnecessary specific objective was added during the course of implementation, which could have been defined as an activity under Output 1.1;
- The development objective was defined similar to Specific Objective 1 which did not reflect the wider effect of the sectoral problem being addressed;
- While the rationale of the project was quite strong and plausible, the key problem(s) to be addressed were not explicitly and clearly defined;
- Problems to be addressed were not analyzed adequately. The analysis was not aided by a problem tree and resulted in unclear cause and effect relationship;
- As the cause and effect relationship was not clear, it was not surprising that the means and ends relationship was also not clear as evident by the weak coherence of the project elements; and
- As a general rule, causes and sub-causes of a problem to be addressed will correspond to outputs and activities, respectively, while effect of the problem would indicate development objective of the project.

Background information on the origin and rationale of the project available in the project document suggested that the key problem to be addressed could have been that machine graded lumber (MGL) was truly needed by the construction sector in order to improve efficiency in lumber use but no capacity to embark in commercial production of such MGL due to the absence of its enabling conditions namely stress grading system, trained personnel, marketing program and strategy, and legal framework. If this was the case, then the project elements could have been defined as follows:

Development Objective	:	To promote use of MGL in the construction sector
Specific Objective	:	To initiate commercial production of MGL
Outputs	:	<ol style="list-style-type: none"><li>1. Stress grading system developed and pilot tested</li><li>2. Trainers of graders and inspectors for MGL grading trained</li><li>3. Marketing program and strategy for MGL developed</li><li>4. Legal framework for production, trade and use of MGL adopted at national level.</li></ol>

The corresponding LFM might look as follows:

Project elements	Indicators	Means of Verification	Assumptions
Development Objective	5 years after project completion, MGL would comprise 20% of lumber used in construction sector	Report of MOI; Report of ASEP	MGL market developed
Specific Objective	Developed grading rules piloted with at least 2 sawmills in year 2; training and marketing programs implemented in year 2; stress grading rules adopted by end of year 2; at least 2 companies convinced to invest in MGL production by end of project	Technical report; Field inspection; Application documents for investment license	Saw millers interested in collaborating
Output 1	Mechanical grading rules and standards developed in year 2	Technical report	National consultants available in time
Output 2	Training program developed and implemented in year 2; 5 trainers of graders and 5 inspectors of MGL trained in year 2	Technical report	Professional trainer available
Output 3	Marketing program and strategy developed in year 2; promotional materials disseminated in year 3	Technical report	National consultants available in time
Output 4	Stress grading rules adopted at national level by end of year 3	Minutes of meeting Correspondence	Support by BPS and ASEP; Supportive government authorities

c. Impacts and Relevance of the Project

Upon completion, the project had delivered a number of outputs and to a large extent achieved its intended specific objectives as discussed in Section 4.1.a. A stress grading system was developed including Builder's and Design manual. The manual had been used in fabricating wooden trusses from MGL for the multi-purposes Day Center low low-rise building in Los Banos and reportedly exhibiting satisfactory performance. This building was also part of the strategy to introduce MGL in the market. A visit to the building confirmed that it is in a good condition.

The machine grading system was piloted in cooperation with two lumber producers and traders, in the production of MGL. One of these cooperators was interviewed at the mill site in Cebu City and expressed his skepticism of market

existence for MGL in near future. According to this producer, selling MGL product is posing great difficulty for various reasons:

- The timber used in the production of MGL was ex-import whose mechanical properties were not fully known. The MGL of different qualities produced using this timber experienced down grading of quality during the time of storage and resulted in lower selling price;
- Substitutes like steel, aluminum and concrete have penetrated the construction material market too deep that selling lumber has become more difficult over time; and
- Convincing end-users to use lumber as structural component of building construction will require massive efforts for a very long time period and must encompass all concerned stakeholders, especially universities, architects and engineers.

In fact, the project was aware of the marketing problems and barriers facing MGL. The various factors that might hinder full appreciation and acceptance of MGL in the market had been identified; these included: i) misconceptions on the use of wood as construction material; ii) scarcity of (good quality) wood; iii) competition from substitute construction materials; iv) awareness/ knowledge gaps; and v) technical considerations.

Realizing the above mentioned potential market barriers, the project had developed MGL marketing program and strategy based on in-depth market study. The various component activities of the marketing program included:

- development, production and distribution of marketing and promotional materials;
- technology presentations and discussion series with key institutions and professional organizations;
- policy support for further development of the technology if necessary and to ensure MGL use in the construction sector;
- curriculum improvement to include the technology in the forestry, architecture and civil engineering academic programs; and
- pilot production and market testing of MGL.

The marketing strategy defined: i) the essential inputs comprising the administrative, financial and technical support to start up the marketing activity; ii) the coordinative mechanism that will facilitate technical presentations to stakeholders as initial information dissemination activities; and iii) the marketing outputs in terms of a

favorable policy environment making MGL part of the country's construction materials standards, integration of the grading technology in the academic programs and the attainment of the marketing objectives, i.e. investment by the private sector, and increased market sales of MGL and share of wood in the construction industry.

The activities of the marketing program had, in fact, been initiated under the project. Information materials in the form of comics and technology leaflets, a video on MGL and a compendium or Technology Guide had been prepared and disseminated; press and radio releases were prepared and distributed to radio stations and newspapers of national circulation; the concept of stress grading and the FPRDI – developed machine grading system were presented to Four Technology/Trade Fairs and Exhibits; technology presentations consisting of three topics: development of stress grades; application of MGL in construction, and economics of using MGL had been conducted for ASEP (Association of Structural Engineers of the Philippines ), FMB (Forest Management Bureau), BPS (Bureau of Product Standards); Metro Manila Lumber Dealers, Forest Based Industry Advisory Committee (FBIAC), College of Engineering and Agricultural Technology of UPLB, CIAP (Construction Industry Association of the Philippines), Matimco Inc., and CREBA (Chamber of Real Estate and Builders' Associations, Inc.; technology fora were held in Cebu City and Cagayan de Oro City attended by representatives from local government offices and private firms; while technology piloting of the stress grading system was done in cooperation with two lumber companies.

Indeed, massive efforts for creating and developing market for MGL had been initiated under the project. Interview with the lumber producer in Cebu City and discussions with FPRDI Officials indicated that market for MGL however, has not developed as to date mainly for two reasons. Firstly, activities of the marketing program apparently had been interrupted after the project was completed in June 2005. Exit strategy of the project was not clearly defined in terms of institutional arrangements and resource need and sources. Secondly, the legal basis for commercial production of MGL has not been promulgated. It is true that "Draft standards on machine graded lumber" had been prepared by the Technical Committee on Timber and Timber Products formed by BPS, but the draft has not been endorsed by BPS as the national standards for MGL for lack of priority and resources. While ASEP had passed a resolution approving the inclusion of MGL as an alternative grading procedure for lumber in the National Structural Code of the Philippines (NSCP), Section 622, inclusion of MGL in the NSCP is subject to



endorsement by BPS of the Draft Standards on MGL. Had the Standards for MGL endorsed by BPS and included in the NSCP, application of the standards would have produced great and long lasting impact on MGL market development. Inclusion of MGL in the NSCP is indeed a necessary but not a sufficient condition to promoting use of MGL. Promulgation of the use of MGL as compulsory is the critical step to creating and developing market for MGL.

In the absence of a reliable stress grading system the project was highly relevant in producing harmonized lumber grading rules for tropical timber which will be traded within and among countries. Such grading system was an objective and effective system that would determine the quality of lumber for construction without necessarily identifying the species of that lumber. The presence of a lumber stress grading system in the market could contribute to the efficient utilization and conservation of timber resources. Consequently, could also have high potentials for more additional plantation establishments and incentives and improved management of natural-growth forests.

This evaluation confirmed the relevance of the project objectives to the Philippines and to ITTO's objectives and priorities. The project however, has not been successful in producing impact to intended beneficiaries. Commercial production of MGL has not materialized more than four years after project completion as national legal framework has not been fully established and adopted while market for MGL has not developed due mainly to the absence of legal basis, interruption of marketing program activities and strong in-road of substitute materials for lumber.

d. Effectiveness of Technology Transfer to Target Groups

Implementation of the activities on marketing program had been effective in transferring the technology developed under the project. Dissemination of the information materials, press and radio releases, presentation of the concept of stress grading to Technology/Trade Fairs and Exhibits, presentation of MGL technology to government officials, private companies, universities and professionals had contributed significantly to promote awareness on stress grading as well as the socio-economic aspects of MGL production. The grading of lumber in Metro Manila and Cebu for example manifests the effectiveness of the technology transfer to participating sawmills. The graders and inspectors were trained to be able to use a stress-grading machine then stamp the appropriate lumber grades in accord with the prepared tables for stress-graded lumber.

The effectiveness of the transfer of technology to sawmills appeared to be effective as evidenced by the trial production of MGL in their respective mills. It was just not fortunate that the market for MGL was not yet developed, thereby, full commercialization has not materialized. Otherwise, these sawmills could have been the model to exhibit the technology transfer with regards to the production of MGL.

e. Unexpected Effects and Impacts

The project did have unexpected effects and impacts as follows:

- i) The hectic schedule of respondents to respond to the socio-economic and market surveys and additional work to comply with the ISO prescribed sampling method. Such unexpected effects required the project for an extension that was longer than the initially planned duration.
- ii) The conduct of the International Workshop on “The Development and Implementation of Stress Grading Rules: The Philippine Experience” ,meant to promote global harmonization of lumber stress grading rules by encouraging other ITTO member countries to initiate similar work in their respective countries, was not planned during the formulation stage. However, the project received constructive comments from ten participants representing key institutions on lumber grading in ten different countries.
- iii) One of the unexpected effects that could not have been foreseen was the high cost of a commercial stress grading machine which might have become an obstacle for investment in MGL production. This matter was discussed with the Vice President of Central Lumber Corporation in Cebu City, but he is more concerned with the readiness of the market for MGL than the price of stress grading machine. This information confirmed the interest of producers to invest in MGL production if market is developed. Therefore, there is a need to the continued information campaign for MGL market development and the need for follow-up actions to fully commercialize MGL in the Philippines.
- iv) During the project implementation, there was a decision from the Philippine government to ban all logging operations leading to the limited supply of lumber in the country. This could have also affected the source of lumber for the construction sector which had led to the use of more steel and concrete in lieu of the limited supply of lumber. This could have also led to the limited popularity

of MGL to end-users and producers in the country because of the limited supply of wood at the time.

f. Sustainability of the Project

Apparently, a clear exit strategy was not defined prior to terminating the project. As such, no institutional arrangements and resource allocation were made to continue critical activities of the project. The Executing Agency is currently working on this issue, particularly in securing the needed financial resources. This move is indispensable in order to avoid losing the awareness and interest in MGL that had been created by the project. Otherwise, these invaluable, intangible yet essential results might be fading away with the passing by of time.

It is advisable to give priority to two activities. It is of utmost important to complete the legal basis for commercial production of MGL: endorsement of MGL standards by BPS, inclusion of the standards in NSCP and enforcement of the standards nationwide. It is also critical to implementing the activities of the marketing program for MGL in order to maintain and preserve the interest and awareness that had been once created by the project.

g. Efficiency and Operational Aspects

The project commenced in March 2000, planned for 30 months. An extension in time until June 2005 was granted by ITTO without additional funding. Therefore, the actual duration of the project was 64 calendar months. The extension period was approved by ITTO in view of some adjustments that had to be made to the work plan. These included the additional work and time needed to ensure that the development of stress grades and rules conformed with the ISO prescribed sampling method, the extended time for socio-economic and market surveys to accommodate the busy schedules of counterpart respondents in the private sector, the conduct of initial marketing activities identified in the marketing program as part of the consultation process, more intensive consultations with stakeholders from various parts of the country consistent with the process being followed by the BPS of getting the proposed stress graded and rules adopted as national standard, and the conduct of International Workshop to determine the feasibility of adopting parallel frameworks in other ITTO member countries toward the eventual goal of harmonizing the stress grading rules for tropical timber produced and traded in the international market. The adjustments made strengthened the overall work plan and contributed to the achievement of project objectives.

The project was implemented in accordance with ITTO rules and procedures as follows:

- Employment of project personnel paid with ITTO funds including Consultants was made with the prior approval of ITTO;
- Award of sub-contracts and purchase of capital items were made based on the approval of ITTO;
- The project had regularly submitted to ITTO the Yearly Plans of Operation, bi-annual progress reports and yearly financial audit reports;
- At completion of the project, the Executing Agency had submitted to ITTO the Completion Report, Final Technical Report and Final Financial Audit Report; and
- Adjustments to work plan and alignment to project budget were made with the prior approval of ITTO.

Consultations with the concerned government and private sectors as well as professional associations proved beneficial in achieving focus in the implementation of project activities. Not only they provided relevant and useful information needed in the analytical aspects of the studies, but also brought up practical issues and insights as well as raise questions regarding technical findings and their implications for lumber producers and end-users.

Effective documentation of activities and results facilitated the monitoring and evaluation of the project. While the three working groups prepared individual progress reports, these were all made available for easy access by all groups for reference, internal discussions and follow-ups.

Project monitoring and evaluation that was done both internally through regular meetings among the project staff and consultants and externally through the Project Steering Committee meetings was an effective mechanism to discuss progress of work, identify areas of coordination and share results among the three working groups, address problems and issues, and thus ensure that activities are well in line with the project design and work plan.

This evaluation confirmed that the project was implemented well despite the extension in time. The holistic framework adopted enabled consideration of relevant influential factors required in technology development. The organizational structure was consistent with the various technical, economic, institutional and social concerns

of technology development and adoption that the project intended to address. The project team was composed of personnel of the required background and practical experience in engineering, forestry, economics, marketing and communication and information technology.

h. The Overall Cost of the Project

The overall costs of the project amounted to US\$ 616,257 contributed by ITTO and US\$ 521,195 representing the counterpart funds of the Philippines government. The ITTO contribution included the costs of completed Pre-project PPD 12/96 Rev.2 (M,I) and ITTO's monitoring, evaluation and program support costs as well as additional funds for the conduct of the International Workshop participated in by selected ITTO member countries.

The amount of ITTO funds disbursed to the Executing Agency was US\$ 523,970 comprising US\$ 489,480 of the original budget and US\$ 34,490 additional funds to hold the International Workshop on the Development and Implementation of Stress Grading Rules: The Philippines Experience. The disbursement of funds was made in six installments upon request by the Executing Agency.

The contribution of the Philippine government amounted to US\$ 521,195 which primarily in-kind consisting of necessary office facilities, counterpart personnel and support management staff. As of December 2003, there was an unspent budget amounting to US\$ 12,765 from the ITTO contribution. As an offshoot of the Project Steering Committee held on 21 January 2004 at FPRDI, this unspent amount was used for implementing follow-up activities to help achieve the intended post-project situation of commercially producing and making available MGL in the market. The proposal was approved by ITTO in March 2004. The various activities to be supported by the unspent funds included: i) sustained information campaign on MGL; ii) inclusion of the design and construction system for MGL in the NSCP; iii) work for the approval of MGL product standards; and iv) commercialization of MGL with an industry partner using the FPRDI-ITTO acquired E-tester.

The project budget was prudently managed. Despite the substantial extension in time, much longer than the originally planned duration, no additional funding from ITTO was requested by the Executing Agency. The savings in the amount of US\$ 12,765 as of December 2003 were possible through efficient spending under individual budget components. The final financial audit report prepared by an

independent registered public accountant indicated that the financial statements of the project presented fairly, in all material respects, the financial position of the project as of December 31, 2005.

i. Stakeholder Involvement

This project was a follow-up to completed pre-project PPD 12/96 Rev.2 (M,I). During the implementation of the pre-project, extensive consultation with stakeholders of MGL comprising lumber producers, users, government officials and professional organizations had been carried out; their comments as well as expectations were accommodated in the results of the pre-project and used as the basis for formulating this project.

Stakeholders were also actively involved in the implementation of the project. The main beneficiaries of the lumber grading system are the lumber users in the construction industry and the lumber producers and traders including producers of timber raw materials. These various groups participated in the implementation of the project through the consultations and discussions conducted with them. The lumber users were represented by the various organizations such as ACEP, CIAP and PICE. The lumber producers and traders were represented by PWPA from the private sector and DENR from the government sector.

Lumber producers and traders directly participated in the project by: i) providing the lumber specimens used in the various strength tests for establishing the stress grades; ii) serving as respondents for the socio-economic and marketing studies; and iii) providing insights and suggestions during consultative meetings. Two lumber producers served as cooperators for the pilot production of MGL which allowed validation of MGL grades established at the FPRDI laboratory and cost estimates used in financial feasibility analysis as well as the conduct of training for lumber graders and inspectors. One of these companies also provided an opportunity for MGL product launching to potential buyers.

Lumber users consisting of engineers, contractors and builders also served as individual respondents for socio-economic and marketing studies and as active participants during consultations and technology fora. ASEP worked closely with FPRDI in coming up with a section on the use of MGL as an alternative grading procedure that is to be incorporated in the NSCP while BPS assisted in the development of standards on MGL. The DENR assisted by undertaking a policy

review and committed to provide the necessary support for policy initiatives through its regional and local offices. From the end-user's side, the local government of Los Banos had entered into an agreement with FPRDI for the design of a Day Care Center that used MGL for its trusses. This prototype was expected to be an effective method of showcasing and testing the performance of MGL.

j. The Outputs versus Actual Intended Situation

- *The utilization of the developed stress graded timber in construction applications*  
The stress grading system developed under the project has not been commercially used in construction applications. The system had been piloted at two lumber companies aimed at validating laboratory results, determining the economics of producing MGL using actual production runs, and pre-testing the training module for operators.

In the absence of any past experience with new technologies, constructing prototypes is an effective method to showcase and test the performance of new and improved building materials. Therefore, prototype roof trusses using MGL had been designed and fabricated. The Day Care Center in Barangay Batong Malake, Los Banos, Laguna, had used MGL for its roof trusses only for purpose of showcasing and testing the performance of MGL.

- *The integration of the developed stress graded timber in the lumber production of both local and imported wood species*  
The stress grading system had been piloted at two lumber companies. The species used in the piloting were both local and imported timber species.
- *The effectiveness of the established training program for trainers to promote the production and quality assurance of stress graded tropical hardwoods*  
The training program developed under the project had been implemented; five graders and five inspectors of MGL had been trained in cooperation with lumber companies. Additional training of MGL graders and inspectors would be conducted by FPRDI once the MGL has been commercialized.
- *The relevance of the financial and economic studies on lumber stress grading for various size sawmills*  
The studies showed that under conservative assumptions on production cost and selling price of MGL, grading lumber will result in increased profits for lumber mill

of various sizes. The studies demonstrated the magnitude of economic incentives for producers of MGL.

- *Marketing assessment and strategies*

The market assessment identified market potential of MGL as well as market barriers and possible entry modes. Findings of the market studies had been used as the basis for developing appropriate marketing program and strategies. The various component activities of the marketing program and activities were defined and initiated under the project.

- *Marketing program on the use of stress graded tropical timber for domestic and export markets*

The marketing program was specifically designed for marketing of MGL in domestic market; it would not be directly applicable to export markets as each market has its own characteristics in terms of consumer taste and preferences as well as technical and legal requirements for importing lumber.

k. Overall Assessment of the Project's Relative Success and Failure

- The project was successfully implemented and achieved its planned outputs and outcomes. This success was attributable mainly to the timely supplied inputs of the project in terms of quantity and quality, effective operational management and full support of beneficiaries to implementation of the project.
- The project was also successful in initiating commercial production of MGL by putting in place the necessary enabling conditions namely the stress grading system, trained professionals, developed and implemented marketing program and strategies and preparation of legal framework.
- The project was less successful in sustaining impact of the project on the production of MGL and its use in the construction sector. Market for MGL is not developing as expected after more than four years of project completion and resulted in the lack of investment in MGL production which was due to mainly the late approval of MGL standards and adoption as the national structural code, the strong penetration of substitutes to the market and the interruption of MGL marketing campaign after project completion. Awareness of the advantageous of using MGL in building construction that had once been raised by the project could



disappear at one point in time should the marketing campaign interrupted for a too long period of time.

I. Contribution to ITTA 1994 and ITTO Libreville Action Plan

- The project had contributed to ITTA 1994 by encouraging further processing of tropical timber, providing an effective framework for co-operation and consultation on all relevant aspects of the tropical timber economy, encouraging national policies that aim at sustainable use of tropical forests, helping expand and diversify international trade in tropical timber and helping research and development that will improve forest management and wood use.
- The project had also contributed to achieving the ITTO Libreville Action Plan by assisting in the promotion and transfer of new MGL technologies, assisting human resource development through training of MGL graders and inspectors, promoting investment in MGL production, formulating R & D proposals on commercialization of new processing and manufacturing technologies, organizing international workshop on MGL, implementing R & D on marketing methods and opportunities and assisting in the promotion, transfer and adoption of new, MGL technologies.

**4.2. Lessons Learned**

- i. The project was built on completed pre-project. During implementation of the pre-project, the Executing Agency conducted sufficient stakeholder consultation. Consequently, aspiration of the beneficiaries was well captured in the formulated MGL project. This had created ownership thus the full support of the beneficiaries to the implementation of the project.
- ii. Formulation of the project did not fully adhere to the ITTO Manual for project formulation and resulted in the weak vertical logic of the project which further manifested in the weak LFM that could not be fully used in assessing achievement accurately especially at the level of objective. In this case, the intended situation after project completion as presented in the project document could be a useful tool for assessment, qualitatively. Quality of the assessment would be highly dependent on the nature of presentation of the intended situation.

- iii. While the project was weak in its design, it was satisfactorily implemented and completed by delivering all its planned outputs and achieving its overall objectives. The key success factors include timely supply of inputs in terms of quantity and quality, effective operational management, prudent financial management, and full support by beneficiaries.
- iv. The project had generated impact on the beneficiaries by creating awareness of the presence of MGL technologies. This impact, however, is less sustainable. The absence of clear exit strategy may jeopardize sustainability of a project's impact. Clearly defining an exit strategy establishing institutional arrangements and financial sources for implementation of critical activities at least one year prior to completing the project is highly advisable. In this manner funding could be secured through appropriation of national budget under established procedures on national budget planning.
- v. The impact is also less sustainable due to the lack of interest to invest in MGL production brought about by the undeveloped market for MGL resulting from penetration of market by substitutes for construction materials and from the absence of legal framework for use of MGL in the construction sector.
- vi. The project was planned for 30 months and extended for 34 months. The time needed to conduct market studies involving numerous respondents and to complete stress grade testing in cooperation with saw millers was much longer than expected. Careful planning by project proponent needs to be exercised when dealing with implementation of activities requiring participation and support by outsiders.

## 5. CONCLUSIONS AND RECOMMENDATIONS

### a. *Planned versus Realized Outputs and Objectives*

- Planned outputs and objectives as defined in the project document had all been achieved. This was evident by comparing the outputs and objectives listed in both the project document and completion report. However, some outputs and specific objectives were, in fact, similar to each other.
- To facilitate comparison between planned and realized objectives and outputs, they must be properly defined consistent with the key problem intended to address and explicitly reflect its effect as well as main causes.

### b. *Project Design*

- The project proposal was formulated without full adherence to the ITTO Manual; problem identification and analysis were performed unsatisfactorily and resulted in a weak vertical logic that was manifested in the weak LFM.
- Strict adherence to existing ITTO Manual for project formulation is needed to ensure a strong vertical logic of project design and to facilitate formulation of a strong LFM; the National Clearing House and ITTO Expert Panel are to ensure this adherence is observed by proponent of any ITTO project.

### c. *Measuring Achievements*

- The LFM presented in the project document could not be used fully and effectively in measuring achievements of the project due to the unquantifiable/unverifiable nature of some of the indicators at both the output and objective levels.
- Indicators must be defined in such a way that they are specific, measurable, appropriate, realistic and time bound. In this fashion, the indicators will be useful for measuring achievements. The National Clearing House and ITTO Expert Panel are to see to it that all indicators are defined in a proper manner.

### d. *Impact and Relevance of the Project*

- The project was relevant to the need of construction sector of the Philippines as it was intended to improve efficiency of lumber use in the construction sector. Impact of the project has not fully materialized after the project completed more

than four years as evident by the fact that no investment had taken place in commercial production of MGL.

- To generate and sustain impact of the project, market for MGL must be developed through provision of legal framework for production and use of MGL and through massive and continued market campaign. The Executing Agency should pay greater attention to this issue by securing the needed resources in the near future.

*e. Effectiveness of Technology Transfer*

- Implementation of the activities on marketing program for MGL had been effective in transferring the MGL technology to target groups through dissemination of information materials, presentations, training, pilot testing, etc.
- Implementation of the activities on marketing program of MGL should be continued in order to preserve and develop the awareness of beneficiaries that had been created by the project. The Executing Agency should secure the needed resources to continue implementing the activities.

*f. Unexpected Effects and Impacts*

- The much longer time than expected to conclude market studies and stress grade testing and conduct of additional activities on international workshop on MGL had required the project for a 34-month extension in time.
- To ensure timely completion of a project, careful planning is necessary when dealing with implementation of activities involving outside parties.

*g. Sustainability of the Project*

- Sustainability of the project is under question mainly due to the undeveloped market and the absence of compulsory legal framework for the production and use of MGL.
- Sustainability of the project could only be preserved by developing market through massive and uninterrupted campaign and by compulsory adoption of MGL standards in construction applications. In order to sustain impact of a project, an exit strategy establishing institutional and financial arrangements for

implementing crucial activities after project completion must be clearly defined at least one year prior to completing a project.

*h. Efficiency and Operational Aspects*

- The project was implemented satisfactorily due mainly to the timely supply of inputs in terms of quantity and quality, able operational management, prudent financial management and full support by beneficiaries. Beneficiaries of the project were involved in the formulation as well as implementation stages which had contributed to the successful completion of the project. Effective documentation of activities and results of the project facilitated effective monitoring exercise both internally and externally and contributed significantly to the successful completion of the project.
- To ensure successful implementation of a project, inputs and operations must be managed wisely and effectively while support by beneficiaries is indispensable. Stakeholder analysis is a crucial step in project designing and stakeholder involvement in project implementation is required as appropriate. Mechanism for involving stakeholder in project implementation shall be made clear in the project design by any project proponent.

*i. Contribution to ITTA 1994 and ITTO Action Plan*

- The project has not fully generated the desired impact on target groups. However, it has contributed to the achievement of ITTA 1994 and ITTO priorities in various ways by promoting and transferring the NEW MGL technologies, organizing international and national workshops, seminars and technology fora on MGL and piloting of MGL technologies for its commercialization.
- Relevance of a proposed project to ITTO's mandate and policies as well as to host country's forestry development policies should remain the prerequisite to eligibility of any project for technical appraisal by ITTO focal point and by ITTO Expert Panel.

## Annex 1

### Terms of Reference for Ex-Post Evaluation

PD 34/99 Rev.2 (I) "Development and Implementation of Stress Grading Rules for Tropical Timber in the Philippines"

No.	Task	Locus in the Report
i.	To assess the projects' design and contribution to the achievement of their respective objectives.	4.1.b
ii.	To assess the achievement of the projects' outputs and specific objectives.	4.1.a.
iii.	To evaluate the impact and relevance of the projects, detailing their impact on development and specific objectives as stated in the project documents.	4.1.c
iv.	To determine the effectiveness of technology transfer to target groups if applicable.	4.1.d
v.	To assess the overall post-project situation for the projects, including the conditions of their intended direct or indirect beneficiaries.	4.1.c; 4.1.f
vi.	To define and assess unexpected effects and impacts, either harmful or beneficial, and present the reasons for their occurrences.	4.1.e
vii.	To analyze and assess implementation efficiency, including the technical, financial and managerial aspects.	4.1.g; 4.1.i
viii.	To assess the overall sustainability of the projects after completion, and include appropriate recommendations to safeguard the continuing of their positive impacts, and enhance utilization of the technologies (if applicable) and other results developed by the projects.	4.1.c; 4.1.f
ix.	Taking into account the results of the evaluation, make an overall assessment of the projects' relative success or failure, to summarize the key lessons learnt; and identify any issues or problems which should be taken into account in designing and implementing similar projects in future.	4.1.k
x.	To assess the overall cost of the projects with original budget provisions, and their respective linkage with the overall results.	4.1.h
xi.	To prepare the evaluation report in accordance with the references for the Project Evaluation Report, as contained in the ITTO Manual for Project Monitoring, Review and Evaluation.	-

xii.	To assess the projects' contribution to the relevant ITTA objectives (1994) and relevant ITTO Action Plan.	4.1.i
xiii.	To prepare one or more articles for each project, for possible publication in the ITTO Tropical Forest Update (TFU), in consultation with the editor, containing an overview of the projects and summarizing the lessons learned from the evaluation work. Appropriate photographs should be provided, if possible.	Separate doc.
	<p>In addition to the above, the consultant is requested to make an in-depth analysis of the outputs of the project and its actual intended situation after project completion, with particular emphasis on: PD 34/99 Rev.2 (I) "Development and Implementation of Stress Grading Rules for Tropical Timber in the Philippines":</p> <ul style="list-style-type: none"> <li>• The utilization of the developed stress graded timber in construction applications;</li> <li>• The integration of the developed stress graded timber in the lumber production of both local and imported wood species;</li> <li>• The effectiveness of the established training program for trainers to promote the production and quality assurance of stress graded tropical hardwoods;</li> <li>• The relevance of the financial and economic studies on lumber stress grading for various size sawmills;</li> <li>• Marketing assessment and strategies; and</li> <li>• Marketing program on the use of stress graded tropical timber for domestic and export markets.</li> </ul>	4.1.j

## **Annex 2**

### **Ex-post Evaluation Mission Program for Projects PD 35/99 Rev.4 (I) and PD 34/99 Rev. 2 (I)**

15 July 2009, Wed	Arrival of Consultant at Manila
16 July 2009, Thu	Entry conference at FMB Office in Manila Departed Manila for Los Banos Opening meeting at FPRDI Office with OIC, Director, Key Officials and former Project Key Personnel
17 July 2009, Fri	Meeting with Project PD 35/99 Rev.4 (I) former Project Key Personnel Departed Los Banos for Cebu City
18 July 2009, Sat	Visit to furniture manufacturer/exporter Visit to Lumber manufacturer/trader
19 July 2009, Sun	Departed Cebu City for Manila
20 July 2009, Mon	Visit to Bureau for Product Standards (BPS) and Association of Structural Engineering of the Philippines (ASEP) Departed Manila for Los Banos
21 July 2009, Tue	Meeting with Project PD 35/99 Rev.2 (I) Key Personnel and National Consultant
22 July 2009, Wed	Meeting with Project PD 35/99, continued Meeting with Project PD 34/99
23 July 2009, Thu	Wrap-up meeting with FPRDI Key Officials and Projects Key Personnel Departed Los Banos for Manila
24 July 2009, Fri	Exit conference at FMB Office in Manila Departed Manila for Jakarta



## Annex 3

### List of Persons Met

Event/Name	Office/Position
<b><u>Entry Conference at FMB (July 16, 2009):</u></b>	
Zosimo I. Pedron	Administration, FMB
Virginia Angeles	Administration, FMB
Ana Rose Df Opena	CBFMD, FMB
Mayumi Quintos Natividad	FED, FMB
Nonito M. Tamayo	NFMD, FMB
Isabelita V. Austria	PPMSD, FMB
John G. Jaramillo	Legal Div., FMB
Jesus A. Javier	Reforestation Div. FMB
<b><u>Opening Meeting at FPRDI (July 16, 2009):</u></b>	
Felix B. Tamolang	OIC, Office of Director
Wilfredo M. America	OIC, Office of DY Director
Robert Natividad	Chief, MPPDD
Rico J. Cabangon	Chief, MPED
Cecile B. Zamora	Chief, TSS
Francisco G. Lapitan	Chief, SMSS
Victor G. Revilla	Head, FFTC
<b><u>Visit to Cebu City (17-18 July 2009):</u></b>	
Jeffrey S. Sinco	Central Lumber Corp., Vice President
<b><u>Bureau of Product Standards:</u></b>	
Teresita G. Del Rosario	Technical Officer
<b><u>Wrap-up Meeting at FPRDI (July 23, 2009):</u></b>	
Felix B. Tamolang	OIC, Office of Director
Rico J. Cabangon	Chief, MPED
Fransisco G. Lapitan	Chief, SMSS
Victor G. Revilla	Head, FFTC
Claire Palunday	Project Staff
<b><u>Exit Conference at FMB (July 24, 2009):</u></b>	
Jesus A. Javier	Chief, Reforestation Div. FMB
Ana Rose De Opena	CBFMD, FMB
Lourdes C. Wagan	Chief, Forest Land-use Div. FMB
Alejandro R. Sibucan	Economist, FMB
Nonito M. Tamayo	NFM Div. FMB
Victor G. Revilla	Sr. Science Research, FPRDI
Marlo D. Mendoza	OIC, Director, FMB

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