

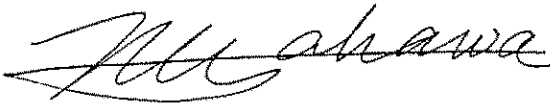
MINUTES OF MEETING  
BETWEEN JAPANESE MANAGEMENT CONSULTATION TEAM  
AND AUTHORITIES CONCERNED OF  
THE GOVERNMENT OF ORIENTAL REPUBLIC OF URUGUAY  
ON JAPANESE TECHNICAL COOPERATION  
FOR THE FOREST PRODUCTS TESTING TECHNOLOGY PROJECT

The Japanese Management Consultation Team (hereinafter referred to as "the Team"), organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Hideki MIYAKAWA, visited The Oriental Republic of Uruguay for the purpose of reviewing past overall progress of the Japanese Technical Cooperation on the Forest Products Testing Technology Project (hereinafter referred to as "the Project") jointly with the Uruguayan Evaluation Team.

A Joint Evaluation Team consisting of the Team and the Uruguayan Evaluation Team conducted interviews with the Uruguayan counterparts, the Japanese experts assigned to the Project and other personnel concerned with the Project, made field survey and exchanged views among themselves.

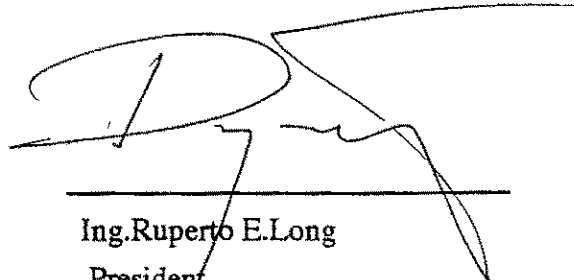
As a result of the above activities, the Joint Evaluation Team agreed to the report on the joint evaluation attached herewith.

Montevideo, December 14, 2000



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Mr. Hideki MIYAKAWA  
Leader  
Japanese Management Consultation Team  
Japan International Cooperation Agency  
Japan



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Ing. Ruperto E. Long  
President  
Technological Laboratory of Uruguay  
The Oriental Republic of Uruguay

REPORT ON THE JOINT EVALUATION  
OF THE FOREST PRODUCTS TESTING TECHNOLOGY PROJECT  
IN THE ORIENTAL REPUBLIC OF URUGUAY

## 1 INTRODUCTION

The Forest Products Testing Technology Project in the Oriental Republic of Uruguay (hereinafter referred to as "the Project") has been implemented since October 1, 1998, based on the Record of Discussions (hereinafter referred to as "the R/D") signed on April 17, 1998, which was revised on October 8, 1999, between the Government of Japan and the Government of the Oriental Republic of Uruguay.

According to the R/D, the Project Purpose is that Technological Laboratory of Uruguay (hereinafter referred to as "LATU") will get the capability to implement quality inspection according to wooden product standards. Furthermore, the Overall Goal of the Project is to promote quality improvement and standardization of forest products of *Eucalyptus.spp.* and *Pinus.spp.* in Uruguay.

In order to enhance an effective implementation of the Project Type Cooperation, JICA has introduced a project management system called "JPCM" (JICA Project Cycle Management). This is a summary of the mid-term evaluation undertaken in the third year of the project period as a part of the JPCM system.

The mid-term evaluation was carried out by a joint evaluation team, consisting of a Japanese management consultation team and an Uruguayan evaluation team. In the first step of the evaluation, the joint team assessed the degree and prospects of achievement of the project purpose and outputs based on the Project Design Matrix (PDM) and the Plan of Operation (PO) of the Project. In the next step, the team analyzed and evaluated the Project from the viewpoints of "effectiveness", "efficiency", "relevance" and "sustainability" in accordance with the JPCM system. Finally, the team made a set of recommendations to the Project in order to improve the project design and to make a smooth achievement of the Project Purpose.



## 2 MEMBERS OF JOINT EVALUATION TEAM

### 2.1 Japanese Side

- (1) Mr. Hideki Miyakawa, Team Leader  
Deputy Managing Director, Forestry and Natural Environment Department, JICA
- (2) Dr. Takashi Nakai, Testing Technology  
Director of Wood Technology Division, Forestry and Forest Products Research Institute,  
Ministry of Agriculture, Forestry, and Fisheries (MAFF)
- (3) Mr. Hideyuki Fujioka, Inspecting Technology  
Director of Agricultural and Forestry Products Division, Technical Department, Kobe  
Center for Quality Control and Consumer Service  
Ministry of Agriculture, Forestry, and Fisheries (MAFF)
- (4) Mr. Hitoshi Nakatsuka, Project Management  
Project Officer, Forestry and Environment Division, Forestry and Natural Environment  
Department, JICA
- (5) Ms. Yasuyo Hirouchi, Evaluation Analysis  
Permanent Expert, International Development Associates Ltd.

### 2.2 Uruguay Side

- (1) Mr. Fernando Stoz , Ing.Qco., Coordinator, Program of Japan Cooperation
- (2) Mr. Takahito Mikami, Counsel of LATU

## 3 OBJECTIVES OF THE EVALUATION

Main objectives of the evaluation of the Project are as follows:

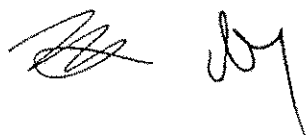
- (1) To conduct a comprehensive evaluation of the achievement against the original plan described in the R/D, the PDM and the PO: and
- (2) To make recommendations and suggestions regarding future project activities and necessary modifications of the project design.

## 4 REVIEW OF THE PDM

Before starting the evaluation, the joint evaluation team had a discussion to re-examine the PDM, which was signed on May13, 1999, and agreed to modify the PDM as attached (Annex

1). The modifications from the previous one are described as follows:

- (1) Narrative Summary
  1. Project Purpose: To make the word "standards" more accurate, a footnote "Existing standards of various countries and international standards" was added.



2. Outputs: The sentences were changed into passive form.
  3. Output1: To make the word “standards” more accurate, the word “standards” was changed into “specifications”.
  4. Output1: To make the words “ wooden products” more accurate, a footnote “Log and sawn timber” was added.
  5. Output2: To make the words “ wooden products” more accurate, a footnote “Sawn timber, glued-laminated timber, laminated veneer lumber, plywood, particle board and medium density fiber board” was added.
  6. Activity 1-1-1-4: To make the sentences more clear, the words “ to decide...” were changed into “for...”. In this connection, the word “conditions” under the Activity 1-4 was deleted for an editorial reason.
  7. Activity 2.1: To make the words “national and international standards” more accurate, they were changed into “standards of various countries and international standards”.
  8. Activity 2.3: The original expression “To establish inspection methods of wooden products in respect of required end uses” was found as an editorial mistake. It was changed into “To establish testing methods for inspection for wooden products in respect of required end uses”.
  9. Activity 2.4: The original expression “To advice on quality control guidance for the wood industry” was also found as an editorial mistake. It was changed into “To advice on quality control for the wood industry”.
  10. Activity 2.2: Activity 2.2 “To establish inspection standards of wooden products in respect of required end uses” was integrated into Activity 2.3 “To establish testing methods for inspection of wooden products in respect of required end uses” as shown in the PO signed on May 13, 1999. Accordingly, the former was deleted from the PDM and the latter was set as the Activity 2.2.
  11. Activity 2.4: Accordingly, the original Activity 2.4 “To advice on quality control for the wood industry” was set as the Activity 2.3.
- (2) Verifiable indicators, means of verification and important assumptions were modified to more measurable ones.
- (3) Accordingly, the Master Plan of the R/D was modified as shown in Annex 2.

## 5 METHODOLOGY OF EVALUATION

The joint evaluation team carried out a field survey at the project site and made interviews with the Uruguayan counterpart personnel as well as the Japanese long-term experts engaged in the Project.

### 5.2 Items of the Evaluation

#### 5.2.1 Accomplishment of the Project

Accomplishment of the Project in terms of Inputs, Activities and Outputs was assessed in comparison with the modified R/D, the modified PDM and the PO.

#### 5.2.2 Analysis of Evaluation Criteria

- (1) Effectiveness: Effectiveness was assessed by evaluating the extent to which the Project has achieved Activities and Outputs.
- (2) Efficiency: Efficiency of the project implementation was analyzed focusing on the relationship between Outputs and Inputs in terms of timing, quality and quantity.
- (3) Relevance: Relevance of the Project was reviewed as the validity of the Project Purpose and Overall Goal in connection with the development policy of the Government of Uruguay and needs of LATU
- (4) Sustainability: Sustainability of the Project was focused in organizational, financial and technical aspects by examining the extent to which the achievement of the Project is sustained or expanded after the assistance is completed.

## 6 RESULTS OF EVALUATION

### 6.1 Accomplishment of the Project

#### 6.1.1 Inputs

(1) Japanese Side

(a) Experts

- i. Long-term experts: A total of three (3) long-term experts have been dispatched in the fields of Chief Advisor / Testing Technology, Inspection Technology and Coordinator
- ii. Short-term experts: A total of six (6) short-term experts have been dispatched. The fields of experts dispatched are Wood Drying, Fundamental Properties of Woods, Mechanical Properties of Woods (two person), Saw Milling and Inspection



## Technology

(b) Provision of machinery and equipment

The machinery and equipment worth approximately 130 million Japanese yen in total have been provided.

(c) Counterpart training in Japan

Four (4) persons of the counterpart personnel have been trained in Japan in the fields of Mechanical Properties of Woods, Saw Milling, Inspection Technology and Structural Properties of Timber.

(d) Others

For the effective and smooth implementation of the Project, a total amount of US\$137,000 has been provided in order to supplement the local cost for the construction of the new building for the implementation of testing and inspection technologies (hereinafter referred to as the Pilot Plant).

(2) Uruguayan Side

(a) Appointment of counterpart personnel

Seven (7) persons have been appointed as the counterpart personnel.

(b) Provision of land, buildings and facilities

Land, building and office spaces at LATU have been provided.

(c) Construction of the Pilot Plant

The construction was completed in September 2000. The total construction cost was approximately US\$187,000, of which US\$50,000 was financed by the Uruguayan side and the balance of US\$137,000 by the Japanese side as mentioned in (1)(d) above.

(d) Local costs

Between October 1998 and September 2000, LATU allocated approximately US\$540,000 to the Forest Product Laboratory. The amount allocated to the Project cannot be specified.

### 6.1.2 Activities

Activities consist of the following seven (7) fields as shown in the modified PDM. The activities completed and ongoing at the time of evaluation are summarized as follows:

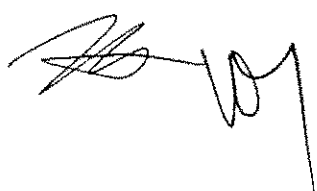
Activities	Results (as of December 2000)
1-1 : To implement investigation of wood properties and testing of wooden product quality for the aptitude for required end uses	<u>Ongoing activities</u> - Analysis of fundamental properties of wood - Analysis of mechanical properties of wood - Data base construction
1-2 : To implement sawing test and process analysis for effective saw milling methods	<u>Ongoing activities</u> - Analysis of sawing characteristics of wood - Technological analysis on suitable sawing for high yield
1-3 : To implement investigation of drying properties and drying schedule tests for effective drying methods	<u>Ongoing activities</u> - Analysis of drying properties of wood - Development of suitable drying system
1-4 : To implement preservation treatment tests and efficiency tests treated wood for the effective treatment	No works have been undertaken due to delay in delivery of machinery
2-1 : To implement survey on standards of various countries and international standards	<u>Completed activities</u> - Survey on standards of various countries and international standards  <u>Ongoing activities</u> - Survey on current production and distribution of various wooden products for standardization
2-2 : To establish testing methods for inspection of wooden products in respect of required end uses	No works have been undertaken.
2-3 : To advise on quality control for the wood industry	No works have been undertaken.

### 6.1.3 Outputs

Accomplishment of each output is as follows:

- (1) Output 1: Quality specifications for wooden products will be established based on the relevant test methods

Verifiable indicators	Results (as of December 2000)
1.a Testing methods for investigation established	Twelve (12) testing methods have been established on two species, and from one provenance.
1.b Database constructed	Seventeen (17) kinds of original data and six (6) kinds of processed data have been collected. Three (3) database formats have been developed. Each of the original data was classified into juvenile and matured woods: thirty-four (34) kinds of data have been accumulated.
1.c Manuals elaborated	No testing manuals have been prepared.
1.d Quality specifications established	Five (5) kinds of diagrammed formats have been developed. Quality specification for modulus of elasticity of <i>Pinus taeda</i> from Rivera has been established.
1.e Improvement in the ability on test	The Project conducted tests approximately 300 times, utilizing the provided machinery. One original research theme on equilibrium moisture contents of wood at 6 sites in Uruguay has been identified by the counterpart personnel and the measurement is ongoing.
1.f Presentations of the results of the activities at meetings, including seminars, and publications	One (1) seminars has been organized by the Project and three (3) research papers have been published. The counterpart personnel participated in 1 <sup>st</sup> and 2 <sup>nd</sup> Expo-Foresta and made four (4) presentations.





(2) Output 2: A quality inspection system will be established at LATU

Verifiable indicators	Results (as of December 2000)
2.a Testing methods for inspection established	Information on standards of various countries and international standards necessary for establishment of testing methods for inspection has been collected. No methods for inspection have been established.
2.b Number and contents of technical advice on quality control	No technical advice has been provided.
2.c Improvement in the ability on inspection	No inspections have been conducted.
2.d Presentations of the results of the activities at meetings, including seminars, and publications	No presentations have been made.

## 6.2 Effectiveness

### 6.2.1 Outputs Level

(1) Output 1

The achievement level of Output 1 is on schedule. However, the workload of the long-term expert in the field of Testing Technology has increased in order to make up for an absence of a long-term expert in the field of Inspection Technology due to the delay of the dispatch and some other factors.

(2) Output 2

The achievement level of Output 2 is significantly behind the schedule. In the case of the counterpart training in Japan, mainly JAS standards were taught and it could not contribute to an increase in the knowledge on other standards of various countries and international standards. In the field of the Inspection Technology, the experiences and knowledge of the dispatched long-term expert did not match technical requirements of the Project. In addition, the dispatched short-term expert concentrated on technical transfer on JAS standard. Technical transfer on standards of various countries and

international standards other than JAS has not yet started.

With regard to the expected level of achievement at the end of the Project, the joint evaluation team could not reach an agreement.

According to the Japanese evaluation team, it is expected that, with incoming inputs, including one long-term expert and two short-term experts, as well as the efficient and adequate project management, the Output 2 would be achieved and would bring out the Project Purpose.

The Uruguayan evaluation team thinks that the Output 2 will not be achieved at the end of the Project period unless urgent corrective measures were adopted and that the extension of the assignment period of the long-term expert in the field of Testing Technology should be considered.

#### **6.2.2 Activity Level**

##### **(1) Activity 1-1**

Activity 1-1 has been carried out, for the most parts, in line with the initial plan. In particular, the counterpart training as well as the short-term experts has brought about remarkable results, which have greatly contributed to the effective implementation of the Project activities.

##### **(2) Activity 1-2**

As the construction of the Pilot Plant was completed in September 2000, the relevant technology transfer was started in November 2000. Although it is currently behind the schedule, the Activity 1-2 is expected to be completed by the end of the Project period.

##### **(3) Activity 1-3**

Although it is currently behind the schedule, the Activity 1-3 is expected to be completed by the end of the Project. The delivery of a drying kiln has been delayed and it is expected that the kiln would be delivered in Uruguay in July 2001. As a result, dispatch of the short-term expert, who was supposed to be sent in the current fiscal year 2000, is being postponed to the next fiscal year 2001.

##### **(4) Activity 1-4**

Activity 1-4 is expected to start in March 2001 when the counterpart training in the



relevant field is conducted in Japan.

(5) Activity 2-1

Activity 2-1 has been carried out, for the most part, in line with the initial plan.

(6) Activity 2-2

The Activity 2-2 is currently behind the schedule. The major cause of the delay was that experiences and knowledge of the dispatched long-term expert did not match technical requirements of the Project. In addition, the dispatched short-term expert concentrated on technical transfer on JAS standard. Technical transfer on standards of various countries and international standards other than JAS has not yet started.

With regard to the expected level of achievement at the end of the Project, the joint evaluation team could not reach an agreement.

According to the Japanese evaluation team, it is expected that the Project could catch up with the delay and the Activity 2-2 could be completed by the end of the Project period.

The Uruguayan evaluation team thinks that the Activity 2-2 will not be completed by the end of the Project period unless urgent corrective measures were adopted and that the extension of the assignment period of the long-term expert in the field of Testing Technology should be considered.

(7) Activity 2-3

In response to strong requests from the wood industry, Activity 2-3 was started earlier than planned.

## 6.3 Efficiency

### 6.3.1 Timing of Inputs

(1) Japanese Side

(a) Dispatch of experts

- i. Long-term experts: An expert in the field of Testing Technology and a coordinator have been dispatched as scheduled. In the case of the field of Inspection Technology, in the first year, an expert who was supposed to be dispatched could not be sent. In the second year, another expert was sent for a year. However, after termination of his assigned period, the successor has not

yet been dispatched (recruitment processes are underway). The delay in dispatching the experts in the fields of Inspection Technology has adversely affected the progress of the activities in the field of Inspection Technology except for those related to collection of information on standards of various countries and international standards.

ii. Short-term experts: Mostly they have been dispatched as scheduled. The dispatch of an expert in the field of Drying Properties has, however, been postponed due to delay in delivery of the machinery.

(b) Provision of equipment and machinery

In the first year, the equipment and machinery was provided according to the schedule. In the second and the third years, however, deliveries of the equipment and machinery were delayed due to delays in construction of the Pilot Plant (for those related Saw Milling) and in preparation of specifications (for those related to Preservation Treatment).

(c) Counterpart training in Japan

Timing was adequate. Especially, the trainees in the fields of Mechanical Properties and Saw Milling had been received in Japan before the relevant short-term experts were dispatched to Uruguay. This contributed to the smooth and efficient technology transfer by these short-term experts.

(2) Uruguayan Side

(a) Land, building, office spaces for experts

Timing was adequate.

(b) Construction of the Pilot Plant

There was a delay. Since it became difficult for the Uruguayan side to finance the construct cost due to the influence of an Economic Crisis in Brazil in January 1999, Japanese side assisted part of the construction through its budget for physical infrastructure. The construction was completed in September 2000. The Uruguayan side acknowledged the special consideration of JICA in responding to the above mentioned unforeseen circumstances.



(c) Appointment of counterpart personnel

Five (5) persons were appointed as the counterpart personnel at the beginning of the Project period. The appointment of the sixth counterpart personnel was delayed and completed in October 1999. In addition, one more person was appointed as the counterpart personnel in March 2000.

(d) Appropriation of local cost

Timing of disbursement of local cost was adequate.

### 6.3.2 Quality and Quantity of Inputs

(1) Japanese side

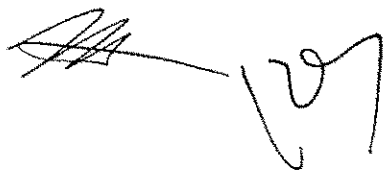
(a) Experts

i. Long-term experts: Quality and quantity of a long-term expert in the field of Testing Technology as well as a coordinator were adequate. However, in the case of the field of Inspection Technology, no expert was sent in the first year. In the second year, experiences and knowledge of the dispatched expert did not match the requirements of the Project. These factors have caused the delay of the Project.

ii. Short-term experts: Quality and quantity of short-term experts in the field of Testing Technology were adequate. In the case of the field of Inspection Technology, the dispatched short-term expert, who was sent in the first year for two months, concentrated on technical transfer on JAS standard. Technical transfer on standards of various countries and international standards other than JAS has not yet started.

(b) Equipment and machinery

Quantity and quality were mostly adequate. In the case of a dust collector installed in the Pilot Plant, it was found difficult to operate. As a countermeasure, a dust collection bag will be installed inside the dust collector. Uruguayan side considers that the Project activities would be carried out more efficiently if the following equipment items were provided: (1) Temperature conditions enclosure for universal testing machine; (2) humidity and temperature controlled cabinet for finishing tests; and (3) stress grading machine.



(c) Counterpart training in Japan

In the field of Testing Technology, quantity and quality were adequate. In the case of the field of Inspection Technology, the requirements of the Project were not informed to the training institutes in Japan properly. As a result, the training on JAS standards was conducted but not on other standards of various countries and international standards.

(2) Uruguayan side

(a) Land and building, office spaces for experts

Adequate.

(b) Construction of the Pilot Plant

As stated in 6.3.1 (2)(a), it became extremely difficult for the Uruguayan side to construct the Pilot Plant for themselves due to an Economic Crisis in Brazil in January 1999. Therefore JICA supported part of the construction, utilizing the budget for physical infrastructure.

(c) Appointment of counterpart personnel

Although seven (7) persons, which is one more than the original plan, have been appointed as the counterpart personnel, not everybody works full-time for the Project since two (2) of them also work respectively for the Plastic Laboratory and the Pulp Laboratory.

In addition, as the technical field of each counterpart personnel has not been well defined yet, it has been found difficult to implement technology transfer efficiently through counterpart training and dispatch of short-term experts.

(d) Appropriation of local cost

The local cost was sufficient to carry out the Project activities.

## 6.4 Relevance

### 6.4.1 Project Purpose

(1) Relevance with Overall Goal

Recent tendency shows a big increase in total volume of production and exports of wooden products of *Eucalyptus spp.* and *Pinus spp.*. To cope with this tendency, there is an increasing need of wood industry for improving testing and inspection capability for wooden products. LATU is the only one institute in Uruguay that is responsible for

conducting tests and inspections of wooden products.

(2) Relevance with Needs of LATU

Wood industry has an extremely high expectation over LATU in terms of testing and inspection of wooden products. Nowadays, the number of contracted test has been increasing. On the other hand, technical level of LATU is not yet improved to be satisfactory. Neither quality specifications nor testing methods are yet established. Consequently, technical transfer by this project has relevance with needs of LATU.

#### 6.4.2 Overall Goal

(1) Relevance with National Policies

The plantations of *Eucalyptus spp.* and *Pinus spp.* have been rapidly increasing since the beginning of 1990s based on policies such as National Five-Year Reforestation Plan. The wood industry shows a great interest in expanding production and exports of wooden products. Therefore, it is essential to improve quality of the wooden products and to enhance standardization in order to increase added value of the wooden products for exports in the future.

### 6.5 Sustainability

#### 6.5.1 Institutional Aspects

(1) Policy Support

According to the law formulated in 1964, objectives of LATU are as follows:

- a. Quality test and certification of export products
- b. Analysis and testing of parts and materials that are temporarily imported for the production of the assembly-export goods.
- c. Analysis and testing of domestic and imported wooden products on the request from public and private sectors.

In addition, forestry policies have not changed since inauguration of the new President in March 2000. It is expected that basic forest policies would continue for enhancing forestry and wood industry. Consequently, it is expected that LATU would contribute to the improvement and standardization of wooden products of *Eucalyptus spp.* and *Pinus spp.* in Uruguay by utilizing Project Outputs after termination of the Project.

(2) Posting of Counterpart Personnel

Counterpart personnel have been appointed and settled as initially planned. However,

because the number of contracted tests and inspections has been increasing, it would be necessary that additional staff be allocated to cope with the related workload.

### **6.5.2 Financial Aspects**

Sources of revenue of LATU include 0.3% of the total amount of the export of the non-traditional products of Uruguay allocated by the Government as well as income from implementation of inspections and quality certifications (LATU brands). As the production and export of wooden products, supported by the national policies, are expected to increase, it is considered that financial sustainability of LATU would be secured.

### **6.5.3 Technical Aspects**

As there is a great expectation from the industry, the technologies transferred are expected to be fully utilized after the completion of the Project. Operations and maintenance of the provided machinery as well as procurement of materials would be no problems.

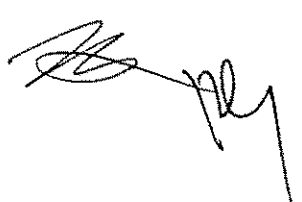
## **7 CONCLUSION AND RECOMMENDATIONS**

### **7.1 Conclusion**

In the field of Testing Technology, the Japanese inputs have been basically realized as planned in terms of dispatch of long-term and short-term experts, provision of equipment and machinery and counterpart training. The activities and the output have been realized in line with the plan. On the other hand, in the field of Inspection Technology, the level of achievement is not satisfactory except collection of data and information concerning wooden product standards. The major causes were that the dispatch of the long-term expert in the first year was delayed and that the experiences and knowledge of the long-term expert in the second year did not match the technical requirements of the Project.

Inputs from Uruguayan side have been sufficiently realized in terms of land, building, office spaces, the counterpart personnel and local costs.

The PDM and the Master Plan of the R/D were modified. In order to reflect these modifications as well as the actual progress of the Activities, the PO was also modified as shown in Annex 3.





## 7.2 Recommendations

1. There is growing demand in wood industry for conducting of tests and inspection of wooden products. The number of contracted tests requested by the wood industry has been increasing. This tendency shows the relevancy of the Project. However, contracted tests could deprive much time from the Project activities and could affect the Project schedule. In order to mitigate above-mentioned difficulties, the following countermeasures are suggested:
  - (1) In order to acquire understanding and collaboration of the wood industry, the Project should explain the Outputs and the Activities as well as its future plan to give a clear-cut image of the Project to the industry:
  - (2) It is desirable that LATU appoint additional staff including counterpart personnel and assistants in order to secure smooth implementation of the Project activities and contracted tests.
2. For the effective and efficient implementation of the Project, it is recommended that the counterpart personnel be appropriately assigned for each field of the Project. In this connection, it is advisable that at least one counterpart be assigned as "principal counterpart personnel" and another one as "secondary counterpart personnel" for each field, which would be decided by LATU.
3. A working safety regulation at the Pilot Plant should be enacted and take every measure to prevent workers' injury and fatal accident. The emergency medical treatment system at the Pilot Plant should be developed and the concerned persons should be well informed.
4. It is advisable that necessary corrective measures be taken for recovering the serious delay in the field of Inspection Technology and that a close follow-up of the implementation be provided to overcome this problem.



Annex I: Modified Project Design Matrix (PDM) for the Project of the Forest Products Testing Technology

Narrative Summary	Verifiable Indicators	Means of Verification	Important Assumptions
<p><b>Overall Goal:</b></p> <p>To promote quality improvement and standardization of wooden products of <i>Eucalyptus</i> species and <i>Pinus</i> species in Uruguay</p>	<p>Standards of wooden products</p>		<p>(1) Continuity of the policy of forestry in Uruguay</p> <p>(2) Sustainability and development of the plantation forests</p>
<p><b>Project Purpose:</b></p> <p>LATU will get the capability to implement quality inspection according to wooden products standards<sup>1</sup></p>	<p>Activities operated independently by LATU</p> <p>1. Implementation of contracted tests and inspection. Kinds of wooden products, inspection items and test items.</p> <p>These activities should be carried out appropriately</p>	<p>1. Reports of the tests and inspections requested by industries</p>	<p>(1) Increase in demands for wooden products</p> <p>(2) Sustainable supply of wood materials for the industries</p>
<p><b>Outputs:</b></p> <p>1 Quality specifications for wooden products<sup>2</sup> will be established based on the relevant test methods.</p> <p>2 A quality inspection system of wooden products<sup>3</sup> will be established at LATU.</p>	<p>1. a Testing methods for investigation established.</p> <p>1. b Database constructed</p> <p>1. c Manuals elaborated</p> <p>1. d Quality specifications established</p> <p>1. e Improvement in the ability on test</p> <p>1. f Presentations of the results of the activities at meetings, including seminars, and publications</p> <p>2. a Testing methods for inspection established</p> <p>2. b No. and contents of technical advice on quality control</p> <p>2. c Improvement in the ability on inspection</p> <p>2. d Presentations of the results of the activities at meetings, including seminars, and publications</p>	<p>1. a-e and 2. a-c Interviews with experts and counterparts, technical reports, project reports</p> <p>1. f &amp; 2. d Proceedings of seminars</p>	<p>(1) Management and maintenance of machinery and equipment</p> <p>(2) Settlement of staff with knowledge and experience</p> <p>(3) Understanding of the activities of LATU by the wood industries</p> <p>(4) Stable and sustainable system of annual revenues</p>

<sup>1</sup> Existing standards of various countries and international standards

<sup>2</sup> Log and sawn timber

<sup>3</sup> Sawn timber, glued-laminated timber, laminated veneer lumber, plywood, particle board and medium density fiber board

Annex 1: Modified Project Design Matrix (PDM) for the Project of the Forest Products Testing Technology

<p><i>Activities:</i></p> <ol style="list-style-type: none"> <li>1.1 To implement investigation of wood properties and testing of wooden product quality for the aptitude for required end uses</li> <li>1.2 To implement sawing test and process analysis for effective saw milling methods</li> <li>1.3 To implement investigation of drying properties and drying schedule tests for effective drying methods</li> <li>1.4 To implement preservation treatment tests and efficiency tests on treated wood for the effective treatment</li> <li>2.1 To implement survey on standards of various countries and international standards</li> <li>2.2 To establish testing methods for inspection of wooden products in respect of required end uses</li> <li>2.3 To advise on quality control for the wood industry</li> </ol>	<p style="text-align: center;"><i>Input</i></p> <p>&lt;Japanese side&gt;</p> <ol style="list-style-type: none"> <li>1. Dispatch of experts</li> <li>-Long term experts</li> <li>Chief advisor</li> <li>Testing technology</li> <li>Inspection technology</li> <li>Coordinator</li> </ol> <p>Note: The chief advisor and coordinator may serve concurrently as one of the experts</p> <p>-Short term experts on necessity</p> <ol style="list-style-type: none"> <li>2. Training in Japan</li> <li>1-2 persons a year</li> <li>3. Provision of machinery and equipment</li> </ol> <p>&lt;Uruguayan side&gt;</p> <ol style="list-style-type: none"> <li>1. Provision of the services of counterpart personnel and administrative personnel</li> <li>2. Provision of land and infrastructures</li> <li>3. Construction of new buildings for the implementation of testing and inspection technologies</li> <li>4. Local costs</li> </ol>	<ol style="list-style-type: none"> <li>(1) Management and maintenance of machinery and equipment</li> <li>(2) Settlement of staff with knowledge and experience</li> <li>(3) Understanding of the activities of LATU by the wood industries</li> <li>(4) Stable and sustainable system of annual revenues</li> </ol> <p style="text-align: center;"><i>Preconditions</i></p> <ol style="list-style-type: none"> <li>(1) Maintain the cooperation system for the Project</li> <li>(2) Adoption of appropriate person into the project</li> <li>(3) Supply of appropriate materials for testing and inspection technology</li> <li>(4) Establishment and settlement of machinery and equipment on suitable timing</li> </ol>
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**Annex 2: Modified Master Plan of the R/D for the Project of the Forest Products Testing Technology**

I. MASTER PLAN

1. Overall Goal

To promote quality improvement and standardization of wooden products of *Eucalyptus spp.* and *Pinus spp.* in Uruguay.

2. Project Purpose

LATU will get the capability to implement quality inspection according to wooden products standards.

3. Outputs of the Project

1. Quality specifications for wooden products will be established based on the relevant testing methods.
2. A quality inspection system of wooden products will be established at LATU

4. Activities of the Project

- 1.1 To implement investigation of wood properties and testing of wooden product quality for the aptitude for required end uses
- 1.2 To implement sawing test and process analysis for effective saw milling methods
- 1.3 To implement investigation of drying properties and drying schedule tests for effective drying methods
- 1.4 To implement preservation treatment tests and efficiency tests on treated wood for the effective treatment.
- 2.1 To implement survey on standards of various countries and international standards on the wooden products for end uses
- 2.2 To establish testing methods for inspection of wooden products in respect of required end uses
- 2.3 To advise on quality control for the wood industry

Activities	Target	Schedule (Fiscal Year: 1 April- 31 March)							Responsible Person in Project Team	Input		
		1998	1999	2000	2001	2002	2003	Experts		Local Cost Seminars (03)	Equipments	
0.0 Sustainable management of the Project												Computer, Copy machine etc. (98)
0.1 Overall Design												
1.0 Testing Technology	Ability of standardization of wooden products											
1.1 To implement investigation of wood properties and testing of wooden product quality for the aptitude for required end uses	Achievement of the various testing technologies required for standardization of wooden products											
a. Analysis of the fundamental properties of wood	Testing abilities of the fundamental properties of wood											
b. Analysis of the growth stress in wood	Attainments of influence to the yield of sawn timber											
c. Analysis of mechanical properties of wood	Achievement of the mechanical grading of sawn timber											
d. Data base construction	Attainment of required qualities for some end uses											
									Expert of Testing Technology Counterpart of Testing Technology	Long term Expert for Testing Technology (98-03) Short Term Expert of Wood Quality (99,01) Short Term Expert of Mechanical Properties of Wood (99,02)	Local Cost Seminars (03)	Cars, Forklift (98) Universal Testing Machine(99) Soft X-ray Apparatus(98) Automatical Ring Width Measurement Apparatus(98) Non-Destructive Testing Apparatus(98) Others

Activities	Target	Schedule(Fiscal Year)						Responsible Person in Project Team	Input	
		1998	1999	2000	2001	2002	2003		Experts	Local Cost
1.2 To implement sawing test and process analysis for effective sawa milling methods. a. Analysis of sawing characteristics of wood b. Technological analysis on suitable sawing due to achievement of high yield c. Analysis of suitable sawing system d. Elaboration of manuals with specifications	Establishment of the suitable sawing products and samples for testing							Expert of Testing Technology	Short term expert of sawing technology (00, 02)	Saw mill system(99) Wood quality detector for standing trees (non-destructive) (98)
	Obtaining the indices for efficient sawing of wooden products									
	Establishment of the fittest methods for the various wood species and log diameter									
	Establishment of the efficient system for wood end products									
1.3 To implement investigation of drying properties and drying schedule tests for effective drying methods a. Analysis of drying properties of wood b. Development of suitable drying system c. Establishment of drying schedule tests d. Elaboration of manuals with specifications	Attainment of the suitable sawing technology for orientation							Counterpart of Testing Technology	Short term expert of wood drying (98, 01)	Kiln drying equipment(00)
	Achievement of the suitable drying methods for various woods									
	Development of the suitable drying methods for various species									
	Attainment of the advices of the drying system of real size									
	Development method for real size lumbers									
	Implementation of the advices and orientation to the industries									

Annex 3: Modified Plan of Operations(PO) for the Project of the Forest Products Testing Technology

December 14, 2000

Activities	Target	Schedule (Fiscal Year)					Responsible Person in Project Team	Input		
		1998	1999	2000	2001	2002		2003	Experts	Local Cost
1.4 To implement preservation treatment tests and efficiency tests on treated wood for effective treatment a. Preservation tests b. Painting and finishing technology c. Elaboration of manuals with specifications	Attainment of the quality control required for the wooden products			—	—	—	Expert of preservation (01)			ICP emission spectrometer (00)
	Establishment of the required treatment for the wood preservation			—	—	—	Expert of finishing (01)			Fire retardant testing apparatus (01)
	Development of the quality of end products			—	—	—	Counterpart of Testing Technology			Clean bench (00)
	Extension of the technical procedure and orientation			—	—	—				
2.0 Inspection technology	Achievement of the required quality for wooden products by the inspection standards	—	—	—	—	—	Expert of Inspection Technology	Long Term Expert of Inspection Technology (98-03)	Technological Exchange (01)	Data logger(98)
	Establishment of classes of standard level	—	—	—	—	—	Counterpart of Inspection Technology	Short Term Expert of Inspection Technology (98)		Hybrid recorder(98)
2.1 To implement survey on standards of various countries and international standards	Collection of the information on the standards	—	—	—	—	—				
	Survey on standards of various countries and international standards on the wooden products for end uses	—	—	—	—	—				
b. Survey on the current production and distribution of various products	Categories of wooden products for standardization	—	—	—	—	—				

Annex 3: Modified Plan of Operations(PO) for the Project of the Forest Products Testing Technology

December 14, 2000

Activities	Target	Schedule (Fiscal Year)						Responsible Person in Project Team	Input			
		1998	1999	2000	2001	2002	2003		Experts	Local Cost	Equipments	
2.2 To establish testing methods for inspection of wooden products in respect of required end uses a. Configuration and verification of the inspection methods b. Elaboration of the inspection manual for end products	Establishment of the inspection standard for required end uses				—			Expert of Inspection Technology Counterpart of Inspection Technology	Expert of the classification and quality control(00)		Table saw(99)	band
	Establishment of the inspection methods for various end products				—							
	Execution system of the inspection for the end products				—							
2.3 To advice on quality control for the wood industry a. Investigation of quality control management suitable to wood industries b. Provision of technical advice on quality control to wood industries	Development of consultation ability					—		Expert of the quality control (02)				
	Development of quality control methods					—						
	Promotion of quality improvement and reliability of LATU					—						



## ウルグアイ林産品試験計画 中間評価レポート

### 1 はじめに

ウルグアイ国林産品計画（以下プロジェクト）は 1998 年 4 月 17 日に日本政府とウルグアイ政府間で調印され、99 年 10 月 8 日に修正された R/D に基づいて、98 年 10 月 1 日から実施されている。

R/D によれば、プロジェクト目標は、「ウルグアイ技術研究所（LATU）が林産物規格に応じた品質検査を実施する能力をつける」である。さらに、上位目標は「ウルグアイ国におけるユーカリとマツの林産物の品質改善と規格化を促進する」である。

プロジェクト式技術協力の効果的実施のために、JICA は JPCM（JICA プロジェクト・サイクル・マネジメント）というプロジェクト管理システムを導入した、これは、JPCM システムの一部として、プロジェクトの 3 年目に実施された中間評価の要約である。

中間評価は日本側の運営指導調査団とウルグアイ側の評価団の合同評価チームによって実施された。第 1 段階では、合同評価チームは PDM（プロジェクト・デザイン・マトリックス）と PO（プラン・オブ・オペレーション：活動計画書）に基づいて計画達成度の見込みを評価した。第 2 段階では、合同評価チームはプロジェクトを「目標達成度」「効率性」「妥当性」「自立発展性」の観点から分析、評価した。最後に、チームはプロジェクト・デザインを改善し、またプロジェクト目標が円滑に達成できるために提案を行った。

### 2 合同評価メンバー

#### 2.1 日本側

- (1) 宮川秀樹（総括）  
JICA 森林自然環境部次長
- (2) 中井孝（試験技術）  
農林水産省森林総合研究所木材利用部長
- (3) 藤岡英幸（検査技術）  
農林水産省神戸農林水産消費技術センター農林産課長
- (4) 中塚仁司（計画評価）  
JICA 森林自然環境部森林環境課
- (5) 広内靖世（評価分析）  
（株）国際開発アソシエイツ、パーマネント・エキスパート

## 2.2 ウルグアイ側

- (1) フェルナンド・ストッツ (日本協力プログラム・コーディネーター)
- (2) 三上隆仁 (LATU 顧問)

## 3 評価の目的

プロジェクトの評価の主目的は以下のとおり:

- (1) R/D に記載されたオリジナル計画、TSI (暫定的実施スケジュール)、PDM 及び PDM に照らして計画達成度について全体的な評価を行う
- (2) プロジェクト・チームに対して、将来のプロジェクト活動及び中間評価時におけるプロジェクト・デザインの修正の必要性を提言する。

## 4 PDM の見直し

評価を始める前に合同評価チームは、1999 年 5 月 13 日に調印された PDM の再検討について話し合い、別添のとおり修正することで合意した (別添 1)。主な修正点は以下のとおり。

### (1) 修正点の要約

1. プロジェクト目標: 「standards」という言葉をより正確にするために「Existing standards of various countries and international standards」という脚注をつけた。
2. 成果: 受身の表現にした。
3. 成果 1: 「standards」という言葉をより正確にするために「specifications」に変えた。
4. 成果 1: 「wooden products」という言葉をより正確にするために「Log and sawn timbers」という脚注をつけた。
5. 成果 2: 「wooden products」という言葉をより正確にするために「Glued laminated timber, laminated veneer lumber, plywood, particle board, medium density fiber board」という脚注をつけた。
6. 活動 1-1~1-4: 文章をより明確にするために、「to decide...」という部分を「for...」に変更した。これに関連して、編集的理由により、活動 1-4 の conditions という単語を削除した。
7. 活動 2-1: 「national and international standards」という言葉をより正確にするために「standards of various countries and international standards」に変えた。
8. 活動 2.3: 「Establish test for inspection methods」は誤記であり、「Establish testing methods for inspection」に訂正された。
9. 活動 2.4: 「To advice on quality control guidance for the wood industry」は誤記であり、「To advice on quality control for the wood industry」に変更した。
10. 活動 2.2: 1999 年 5 月 19 日に調印された PO に沿って、活動 2.2 「Establish inspection standards of wooden products in respect of required end uses」を活動 2.3 「Establish testing methods for inspection」に組み込んだ。前者は削除され、後者は新たに活動 2.2 とされた。

11. 活動 2.4: 上記にともない、活動 2.4 は活動 2.3 と読みかえられた。

(2) 指標、入手手段、外部条件はより具体的なものに修正した。

(3) PDM の修正にともない、R/D のマスタープランを別添 2 のように修正した。

## 5 評価の方法

### 5.1 調査

合同中間評価チームはプロジェクト・サイトにおける視察及びウルグアイのカウンターパートと日本の長期専門家へのインタビューによって評価を実施した。

### 5.2 評価項目

#### 5.2.1 プロジェクトの計画達成度

修正 RD、修正 PDM 及び PO に照らして、投入・活動・成果の計画達成度が評価された。

#### 5.2.2 評価項目分析

- (1) 目標達成度: 活動と成果がどの程度目標を達成したかが評価された。
- (2) 効率性: 成果に対する投入のタイミング・質・量の関係が評価された。
- (3) 妥当性: ウルグアイ政府の開発政策と LATU のニーズに照らしあわせてプロジェクト目標と上位目標が妥当であるかが評価された。
- (4) 自立発展性: 協力終了後もプロジェクトの効果が持続／拡大されるかについて、組織的・財政的・技術的観点から評価された。

## 6 評価の結果

### 6.1 計画達成度

#### 6.1.1 投入

(1) 日本側

(a) 専門家

i. 長期専門家:

リーダー／試験技術、検査技術、調整員の合計 3 名の長期専門家が派遣された。

ii. 短期専門家

合計 6 名が派遣された。分野は乾燥・強度 (2 名) ・基礎材質・製材・検査技術。

(b) 機器材

合計で約 1 億 3000 万相当の機器材が供与された。

(c) カウンターパート研修

4名のカウンターパートが日本で研修を受けた。分野は、木材強度・製材・検査・強度性能評価である。

(d) 予算措置

効果的で円滑な実施のために、製材実験棟建設のウルグアイ側ローカル・コストの補充費として、プロジェクト基盤整備費合計13万7,000ドルが供与された。

(2) ウルグアイ側

(a) カウンターパートの配置

7名がカウンターパートとして配置された

(b) 土地、建物、施設、専門家のオフィス・スペース

計画どおり提供された。製材実験棟の建設が1999年1月に起きたブラジル経済危機の影響で不可能となり、これをJICAのプロジェクトの基盤整備費で補充して実施した。

(c) 製材実験棟の建設

建設は2000年9月に完了した。総工費は約18万7,000ドルで、このうち約5万ドルをウルグアイ側が負担し、上記(a)に記したように、残りの約13万7,000ドルを日本側が負担した。

(d) ローカル・コスト

1998年10月から2000年9月までの間、LATUは林産品室に約54万ドルの予算を配分した。このうちプロジェクトに配分された予算を分類することは不可能である。

### 6.1.2 活動

活動は修正 PDM に示されるとおり、以下の 7 分野に分けられる。評価時点で終了・進行中の活動は以下に要約するとおり。

活動	実績 (2000 年 12 月現在)
1-1: 用途適性を検討するための木材組織解明・基礎材質試験を行う	進行中の活動 - 基本特性の分析 - 機械特性の分析 - データベース構築
1-2: 効果的製材方法を検討するための鋸断試験、木取り試験、工程分析等を行う	進行中の活動 - 鋸断特性の分析 - 適切な鋸断の技術分析
1-3: 効果的乾燥方法を検討するための乾燥特性試験、スケジュール試験を行う	進行中の活動 - 乾燥特性の分析 - 適切な乾燥システムの開発
1-4: 材質改良分野で効果的な処理条件を検討するための保存処理試験と処理材の性能評価試験を行う	機材搬入の遅れにより未着手。
2-1: 国別・国際規格に関する調査を行う	完了した活動 - 国別・国際規格に関する調査 進行中の活動 - 生産・流通に関する調査
2-2: 検査用試験方法を確立する	未着手。
2-3: 品質管理に関する助言を行う	未着手。

### 6.1.3 成果

各成果の実績は以下のとおり。

(1) 成果 1 : 適切な試験方法により木材製品の品質基準が設定される

指標	実績 (2000 年 12 月現在)
1.a 確立された試験手法	1 産地 2 樹種を供して、12 の試験手法が確立された。
1.b 構築されたデータベース	素データが 17 項目、加工データが 6 項目集められた。3 種類のデータベース・フォーマットが開発された。17 項目の素データを未成熟材と成熟材にわけて 34 項目のデータが入力された。

1.c 作成された試験マニュアル	ゼロ。
1.d 設定された品質基準	5種類の図化フォーマットが作られた。リベラ産テダマツの弾性の基準が設定された。
1.e 試験能力の向上	供与機材をつかってのべ約 300 回の試験がプロジェクトによって行われた。LATU 独自で カウンターパートにより国内 6ヶ所の平衡含水率に関する研究テーマが設定され、測定を実施中である。
1.f セミナー等の会議や出版物における活動結果の発表	プロジェクトによってセミナー一度企画され、3編の論文が公刊された。カウンターパートは農牧水産省後援の第1、2回の EXPO-FORESTA（林業博覧会）に参加して4件の発表を行った。

(2) 成果 2: LATU において品質検査システムが確立される

指標	実績
2.a 検査用試験方法の確立	検査用試験方法の確立に必要な国別・国際規格に関する資料が収集された。検査手法は確立されていない。
2.b 業界に行った品質管理の助言回数	技術助言回数はゼロ。
2.c 検査能力の向上	実施された検査はゼロ。
2.d セミナー等の会議や出版物における活動結果の発表	セミナー開催、発表件数はゼロ。

## 6.2 目標達成度

### 6.2.1 成果レベル

(1) 成果 1

成果 1 はプロジェクト目標達成に向けて計画通り順調に推移している。ただし、検査技術部門の長期専門家派遣が 1 年遅れたことなどの影響を受け、試験技術分野の長期専門家の負担が増大した。

(2) 成果 2

計画よりかなり遅れている。カウンターパート研修において、主として JAS 規格に関する研修は実施されたが、他の国別規格及び国際規格に関する知識の向上はできなかった。派遣された長期専門家の経験と知識がプロジェクト側の技術ニーズに合致していなかった。さらに、短期専門家は JAS 規格が専門であったため JAS 以外の国別規格と国際規格に関する技術移転はまだ開始さ

れていない。

プロジェクト終了時の成果2の達成の見込みについて、合同評価チームは合意に達することができなかった。

日本側評価チームによれば、今後、長期専門家1名、短期専門家2名の派遣等の投入及びプロジェクトの効率的かつ適切な運営により、成果2は達成でき、プロジェクト目標をもたらすことができる見込みである。

ウルグアイ側評価チームは、緊急の是正手段がとられない限り、成果2はプロジェクト期間内に達成されず、試験技術分野の長期専門家の任期延長が考慮されるべきであると考えている。

## 6.2.2 活動レベル

### (1) 活動1-1

活動1-1は計画通りほぼ順調に推移した。特にカウンターパート研修及び短期専門家の派遣による成果には著しいものがあり、LATUでのプロジェクト活動の効率的推進に大きく貢献している。

### (2) 活動1-2

製材実験棟の完成が2000年7月と遅れたため、LATUでの技術移転は2000年から開始された。時間的遅れはあるが、活動1-2はプロジェクト終了時までには計画通り完了する見込みである。

### (3) 活動1-3

時間的遅れはあるが、活動1-3はプロジェクト終了時までには完了する見込みである。実大乾燥装置の搬入が計画より遅れ、2001年7月頃となる予定で今年度(2000年度)予定の短期専門家派遣が来年度になる。

### (4) 活動1-4

関連分野のカウンターパート研修が2001年3月から実施され、活動が始まる予定である。

### (5) 活動2-1

活動2-1はほぼ計画どおり進行中である。

### (6) 活動2-2

活動2-2は計画より遅れている。遅延の主原因は派遣された長期専門家の経験と知識がプロジェクト側の技術ニーズに合致していなかったことにある。短期専門家はJAS規格が専門JAS以外の国別規格と国際規格に関する技術移転はまだ開始されていない。

プロジェクト終了時の活動2-2の達成の見込みについて、合同評価チームは合意に達することができなかった。

日本側評価チームによれば、今後、プロジェクトは遅れを取り戻すことができ、活動はプロジェクト期間までに完了する見込みである。

ウルグアイ側評価チームは、緊急の是正手段がとられないかぎり、活動2-2はプロジェクト期間に達成されず、試験技術分野の長期専門家の任期延長が考慮されるべきであると考えている。

(7) 活動2-3

業界からの強い要請があり、計画を前倒しにして、一部着手している。

## 6.3 効率性

### 6.3.1 投入のタイミング

(1) 日本側

(a) 専門家の派遣

- i. 長期専門家：試験技術分野の専門家と調整員は計画通り派遣された。検査技術分野については、初年度は予定されていた人材を派遣できなかった。2年度に別の専門家が1年間派遣された。しかしながら、後任はまだ派遣されていない（リクルート中である）。この遅延は、規格に関する情報収集を除き、検査分野のプロジェクト活動の進捗に影響を与えている。
- ii. 短期専門家：おおむね計画通り派遣された。ただし、乾燥分野の専門家は機材の到着の遅れにともない、派遣が延期されている。

(b) 機器材の供与

初年度は機器材の搬入は問題なかった。2年度以降、機材の搬入は予定より遅れている。製材実験棟の建設（製材関連機器材）、仕様書作成の遅れ（防腐関連機器材）などが原因である。

(c) カウンターパート研修

適切なタイミングで行われた。特に、強度・製材の研修員については短期専門家派遣の前に受け入れたことにより、その後の技術移転もスムーズに行われ、効率的であった。

(2) ウルグアイ側

(a) 土地・建物・専門家の執務スペース

適切なタイミングだった。



(b) 製材実験棟の建設

遅れた。1999年1月に起きたブラジル経済危機の影響でウルグアイ側の建設費負担が困難となったため、日本側のプロジェクト基盤整備費で補充して建設した。ウルグアイ側は上記の予測不可能な事態に対して JICA のとった特別配慮に感謝の意を表している。

(b) カウンターパートの配置

プロジェクト開始時に5人が配置された。6人目の配置が遅れたが1999年10月に採用され、カウンターパート配置は完了した。さらに2000年3月に1人が採用され、7人体制となった。

(c) ローカルコスト

適切であった。

### 6.3.2 投入の質と量

(1) 日本側

(a) 専門家

- i. 長期専門家：試験技術分野の専門家と調整員は適切だった。しかし、検査技術分野では初年度は専門家が派遣されず、2年度は派遣された専門家の経験と知識がプロジェクトの技術ニーズと合致しなかった。このため、活動に遅れが生じた。
- ii. 短期専門家：試験技術分野の短期専門家は適切だった。検査技術分野においては、初年度に2カ月派遣された専門家は JAS 規格が専門であったので、JAS 以外の国別規格と国際規格に関する技術移転はまだ開始されていない。

(b) 機材

おおむね適切であった。製材実験棟の集塵機については操作に難があることがわかった。解決手段として、集塵袋が集塵機内に設置される予定である。ウルグアイ側は、(1) (2) (3) が供与されればプロジェクト活動はより効率的に行われるだろうと考えている。

(c) 日本におけるカウンターパート研修

試験技術分野の研修は質・量ともに適切であった。ただし、検査技術分野の研修では、プロジェクトの研修要請内容が適切に研修実施機関に伝わらなかった。その結果、JAS 規格については研修を実施したが、その他の国別・国際規格に関する研修は実施されなかった。

(2) ウルグアイ側

(a) 土地・建物・専門家の執務スペース

適切であった。

(b) 製材実験棟

6. 3. 1 (a) で記したように、1999年1月のブラジルの経済危機により、ウルグアイ側の実験棟建設が非常に困難になったため、JICAはプロジェクト基盤整備費を活用して建設を支援した。

(c) カウンターパートの配置

当初計画よりも1名多い7名が配置されているが、中に、2名、プラスチック研究室とパルプ研究室の仕事をそれぞれ兼務しているカウンターパートがあり、全員がプロジェクトにフルタイムで従事しているわけではない。また、カウンターパートの専門分野が未分化であるので、カウンターパート研修、短期専門家の派遣等による効率的な技術移転が計画的に行いにくい。

(d) ローカルコスト

プロジェクト運営上、支障はない。

## 6.4 妥当性

### 6.4.1 プロジェクト目標

(1) 上位目標との適合性

ユーカリ・マツの林産品の生産および輸出は拡大傾向にあり、これらに対して木材業界の林産品の試験・検査能力改善のニーズは高まっている。また、林産品の試験・検査を行う機関はLATU以外に存在しない。

(2) LATUのニーズとの適合性

林産品の試験・検査に関する木材業界のLATUに対する期待はきわめて高い。現在も民間企業やINIA（農牧研究所）からの委託試験の件数は増加している。一方、LATUの試験・検査に関する技術レベルは十分とはいえず、また品質基準や試験・検査の手法も確立していない状況にある。従って当プロジェクトによる技術移転の意義は高い。

### 6.4.2 上位目標

(1) 国家政策との適合性

国家造林5ヵ年計画等の政策に基づき、1990年代初期よりユーカリ・マツの造林が年々急速に拡大しており、木材業界の林産品生産・輸出拡大への熱意はきわめて高い。今後、輸出林産品等の付加価値を高めるためには品質向上と規格の整備が必要不可欠である。

## 6.5 自立発展性の見込み

### 6.5.1 制度的側面

#### (1) 政策支援

1964年制定のLATUに関する設置法によると、LATUの任務は以下の3点である。

- a. 輸出製品の品質試験と認定
- b. 輸出製品のために一時的に輸入する部品等の分析・試験
- c. 官・民機関の依頼に応じて実施する国産品および輸入品の分析・試験

また、2000年3月に新大統領が就任したが、林業の基本政策に変更はなく、今後とも林業、林産業を育成していく政策は継続していくと思われる。以上から、当プロジェクト終了後もLATUがプロジェクトの成果を活用し、林産品の試験・検査の向上に貢献することが期待される。

#### (2) カウンターパートの配置

LATUのスタッフは当初計画通りに配置され、しっかりと定着しているが、ウルグアイ国における林(産)業の発展と当プロジェクトの活動の進展により、委託試験・検査数は増加しており、さらなる人的配置が必要になるとと思われる。

### 6.5.2 財政的側面

LATUの運営資金は国の非伝統的生産物輸出総額の0.3%、委託検査、品質保証(LATUマーク)が財源となっている。今後、国の政策により、林産品の生産・輸出は増加すると予測されるので、LATUは財政的にも安定すると期待される。

### 6.5.3 技術的側面

産業界からの期待も大きく、移転された技術は今後も十分活用されることが期待される。また、プロジェクト終了後の機器材の維持管理、及び試験材料の確保も問題なくおこなわれると判断される。

## 7 結論と提言

### 7.1 結論

当プロジェクトの2分野のうち、試験技術分野は、長・短期専門家の派遣、機材供与、カウンターパート研修の日本側投入がほぼ計画通りに実施されており、プロジェクト活動及び成果もほぼ順調に推移している。これに対して、検査技術分野は、林産品の規格に関するデータ・情報収集を除いては達成度は不十分である。初年度の長期専門家の派遣が遅れたことが主な原因である。

また、ウルグアイ側の投入（土地、施設、オフィス・スペース、カウンターパート、ローカルコスト）は十分実施された。

PDM と R/D は修正された。これらの修正点、及び実際の活動の進捗状況に鑑み、PO も別添3に示す通り修正された。

### 7.2 提言

1. 木材業界からの委託試験・検査の件数が増加するなど業界の試験・検査の実施に対するニーズが高まっている。このことはプロジェクトの妥当性を示す事象であるが、同時に委託試験に時間がさかれたり、プロジェクト活動のスケジュールを圧迫する要因ともなりかねない。この対応策として次の2点が提案される。
  - (1) 木材業界に当プロジェクトの成果・活動状況と今後の計画を説明し、業界の理解と協力を得るべきである。
  - (2) カウンターパートおよびアシスタント等のスタッフを増員し、プロジェクト活動と委託試験の円滑な実施を確保することが望ましい。
2. プロジェクトの効果的かつ効率的な実行のために、カウンターパートをプロジェクトの各分野ごとに適切に配置すること。この場合、各分野ごとに少なくとも一人のカウンターパートを「主」とし、もう一人を「副」として任命する。この配置は LATU によって決められる。
3. 製材実験棟での労働安全規則を制定するとともに、人命・障害事故等が起らないように対応策をとる。実験棟における緊急医療措置システムを講じ、関係者に周知させるべきである。
4. 検査技術分野における深刻な遅延を回復するために必要な対応策がとられ、また、この問題に対処するために実施に関して綿密なフォローアップが行われるべきである。