

INTERNATIONAL TROPICAL TIMBER ORGANIZATION

ITTO

PROJECT PROPOSAL

TITLE	SPECIALIZATION PROGRAM FOR FOREST TECHNICIANS ON SUSTAINABLE TROPICAL FOREST MANAGEMENT IN BOLIVIA
SERIAL NUMBER	PD 63/97 Rev.3 (F)
COMMITTEE	REFORESTATION AND FOREST MANAGEMENT
SUBMITTED BY	GOVERNMENT OF BOLIVIA
ORIGINAL LANGUAGE	SPANISH

SUMMARY

This project is aimed at the strengthening of ETSFOR with a view to sustainable forest resource management. To this end, the strengthening of forest professionals' skills is proposed for the sustainable management of tropical forests in the country. Thus, the specific objective of the proposal is "to strengthen the technical capabilities of forest technicians in the areas of forest management and utilisation, by increasing the quality of the technical human resources in charge of managing the forests as the main players in the planning and implementation process".

EXECUTING AGENCY UNIVERSIDAD MAYOR "SAN SIMON" THROUGH ETSFOR (ESCUELA TECNICA SUPERIOR FORESTAL)

DURATION 42 MONTHS

APPROXIMATE STARTING DATE UPON APPROVAL

BUDGET AND PROPOSED SOURCES OF FINANCE	Source	Contribution in US\$
	ITTO	587,232
	ETSFOR	240,423
	TOTAL	827,655

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PART I: CONTEXT

A: Relevance to ITTO

1. Compliance with ITTO objectives

The project meets the following objectives of the International Tropical Timber Agreement:

- c) To contribute to the process of sustainable development;
- d) To enhance the capacity of members to implement a strategy for achieving exports of tropical timber and timber products from sustainable managed sources by the year 2000;
- f) To promote tropical timber reforestation and forest management activities;
- g) To develop and contribute towards mechanisms for the provision of new and additional financial resources and expertise needed to enhance the capacity of producing members to attain the objectives of this Agreement.

This proposal contributes to objectives c, d, f and g, because the project promotes the training of skilled human resources in order to conduct forest management activities with a view to contributing to the process of sustainable development through sustainable forest management.

In Bolivia, an ITTO producing member country and party to the Agreement, it is essential to have human resources trained in sustainable forest management. These trained specialized technicians will meet the challenge of ensuring that forestry actions are geared towards the achievement of the Year 2000 Objective of the Agreement, thus ensuring that forest products, for domestic or export trade, come from forests managed by forest professionals who know and implement sustainable forest management techniques.

The success of this project is based on the academic institutional framework of ETSFOR which intends to meet the growing demand for professionals with technical skills in forest management, so that these trained human resources can provide a solid base to the Government, to business ventures and to society and its institutions, helping to overcome the uncertainty of managing the forests in a sustainable manner and at the same time yielding economic benefits.

A trained technical resource will mean greater security for private sector investment which, in compliance with the Forestry Law, must draw up and implement a management plan based on the concept of sustainability. It will also assist the Forest Superintendency in charge of the regulations as well as the prefectures and municipalities which also play a role in the National Forest Regime.

2. Compliance with ITTO criteria

The Project is relevant to the following aspects of Article 23 of the Agreement:

- Wood utilisation, including the utilisation of lesser-known and lesser-used species;
- Natural forest development;
- Reforestation development;
- Harvesting, logging, infrastructure, training of technical personnel.
- Institutional framework, national planning.

The rationale is as follows:

- * The training of forest technicians in sustainable forest management and silvicultural systems will be geared to maximising timber forest production in the context of the existing potential resources, and will contribute to the foundation of a long-lasting community or commercial industry;
- * The training measures, in the design of the management plan, will focus particularly on commercially lesser-used timber species present in the forest, which will contribute to increasing species diversity in the production and trade of tropical timber, thereby increasing the current economic value of the forest;
- * The trained technicians will be able to manage the natural forests by implementing the most appropriate silvicultural techniques to reduce the risk of resource destruction;
- * The training syllabus will include the subject of harvesting and the respective infrastructure, and will provide the professionals with the capacity to use "forestry extension" methodologies in forest management;
- * ETSFOR is a tertiary institution whose mission is to train forest professionals and to develop and to disseminate science and technology. Implementing a project to improve the capabilities of forest technicians will therefore strengthen the institutional mission the State has assigned to ETSFOR within the National Plan.

3. Relationship to ITTO Action Plan and Priorities

In relation to the priorities established by the three ITTO Committees, the project is consistent with the following activities:

*** Reforestation and Forest Management.**

- Study on the economic and financial costs and benefits of forest management.
- Comparative assessment of silvicultural treatments on permanent sample plots.
- Study of the effect of different levels of timber harvesting on forest sustainability.
- Specification, with FAO, of training requirements for forest management and administration.

*** Forest industry**

- Support for existing training institutes, including curriculum improvement; and preparing and disseminating technical training materials.

*** Economic Information and Market Intelligence.**

- Studies on supply and demand, including the availability and market acceptance of lesser known species.
- Evaluating the relative economics of natural and plantation forest management and the corresponding environmental impact assessment.

In relation to the strategy towards sustainable tropical forest management, the Project takes into consideration ITTO's objective of arresting the decline and degradation of tropical forests and contributing to the achievement of Year 2000 Objective in the following operational areas:

- continued development of tropical forest practices and regulations for sustainable management of tropical forests, taking into account ITTO guidelines, and national and local conditions;
- projects leading to the achievement of sustainability and the Year 2000 Objective, to be financed through the Special Account;
- the flow of technology to improve forest management, the use of tropical timber, and the value of tropical timber products.

And in relation to the guidelines for the sustainable management of natural tropical forests, the project contributes to the following:

- Forest planning (including inventories, management objectives, silvicultural concepts, yield regulations, mapping and management inventories, work plan development and environmental impact assessments);
- Harvesting (including pre-harvest prescriptions, roads, extraction and post-harvest stand management);
- Protection (including access control, fires, use of chemicals).

B. Relevance to national policies

1. Relationship to sectoral policies affecting tropical timber

With respect to the General Plan for the Economic and Social Development of the Republic (PGDES), this project relates to the following strategic objectives:

- *Productive transformation*, interpreted as a change in production systems and methods as well as production diversification, particularly (initially) of the natural resources tapped in conformity with sustainability criteria.
- *Human development*, by strengthening technical capabilities, thereby changing the attitude, behaviour and skills of the population vis-a-vis natural resources, and supporting popular participation with respect to their responsibilities, conferred by law, in relation to natural and forest resources.
- *Rational utilisation of natural resources and preservation of the environment*, to overcome irrational logging of forest resources.

The project adopts the concept of sustainable development in its four fundamental principles: *economic growth*, *social participation*, *rational use of natural resources* (including forest resources), and *governability* (in the case of forestry, application of the Forestry Law in the areas of decentralisation and "municipalisation" or empowering of local governments).

Considering the OPERATIONAL ACTION PLAN (1997-2002) called "For a Better Life", a document drafted by the Government of Bolivia, this project will contribute to "increasing productivity" as a result of which "it will have a higher capacity (industry) to capture technological advances" (See previously mentioned document under the heading Opportunity; subheading 2.5. Production and Service Sectors, sub-paragraph a.). The following statement on the above-mentioned PLAN should also be highlighted. It says, "Ongoing training and education of workers, specialised technical training courses and workshops, and management training programs, will be supported" (See under the heading Opportunity; subheading 2.10. Workforce Development). Also, what is indicated as an objective to improve the quality of the educational system, "Strengthening the academic performance of universities, through the upgrading of teaching staff and internships at foreign universities". See under heading Equity; subheading 2.2. Education; sub-paragraph a.).

In relation to national forest policy as expressed in the Forestry Law (Law 1700), the project contributes closely to the following development objectives, which appear in article 2 of the above mentioned Law:

- a) To promote the establishment of sustainable and efficient forest activities so as to contribute to the achievement of national socio-economic development targets.
- b) To achieve improved sustainable forest resource yields while ensuring the conservation of ecosystems, biodiversity and the environment.
- f) To promote understanding and create awareness amongst the national population regarding the rational management of watersheds and their forest resources.

In relation to strengthening the training of technicians, the project directly contributes to one of the main policies of the PGDES:

- * Professional education and human resource training. It is stated that: "It is necessary to establish an integrated process of professional education and labour training in which the State in coordination with the private production sector makes possible the full development of its productive capabilities." "Training will be undertaken as a real investment on human resources and its results will be reflected in higher productivity levels and more flexible attitudes with respect to the addition and development of new technologies".

(See document "MAIN POLICIES OF PGDES", subheading 3.2 Professional Education and Training of Human Resources).

2. Relationship to subsectoral aims and programmes

This project relates to the following specific objectives of the National Forestry Action Plan:

- * Assessment of production forests in order to identify their potential and to define investments so as to attain a sustainable yield from the resource.
- * Offer local communities adequate means of subsistence through the appropriate utilisation of forest resources.

It also closely relates to the following strategies of the National Forestry Action Plan (See document Forestry Action Plan for Bolivia. 1991-1996. Published by Ministry for Agricultural and Rural Affairs, La Paz, Bolivia, 1991):

- * The Institutional Strategy states the following (sub-paragraph f): "Environmental education and training in different areas and population strata of the country" is the responsibility of public sector institutions.
- * The Forest Utilisation Strategy stipulates (sub-paragraph a): "The utilisation of forests and of other resources associated with the forest, will follow a sustainable yield criterion".
- * The Investment Promotion Strategy reads (sub-paragraph d): "The Government will establish educational centres to provide training on various activities in the forest production sector".
- * The Human Resources Development Strategy states (sub-paragraph c): "Specialization in different disciplines will be achieved through different identified projects, for which the necessary financial requirements should be considered". Also in sub-paragraph e, "The syllabuses of universities which offer biology training will include subjects related to community participation in natural resource management and to environmental aspects in general".

3. Institutional and legal framework

The project will be under the institutional responsibility of San Simón Higher University (UMSS) through the Faculty of Agricultural Science, and it will be operated by ETSFOR.

UMSS is part of the autonomous National Public University System.

ETSFOR is one of four institutions providing forestry training in the country, and the only one responsible for training higher level professional forest technicians.

At the level of Government policy decision-making, the project is registered as part of the NATIONAL FORESTRY ACTION PLAN. The National Government will appoint the relevant body to be in charge of monitoring the development of the project and ensuring that it complies with government guidelines regarding forest resources.

In the operational process, the project will deal directly at a national level with the National Forestry Superintendency and with the National Forestry Chamber. It will also have a functional relationship with the Juan Misael Saracho University in Tarija, Gabriel René Moreno University in Santa Cruz and Mariscal José Ballivian University in Beni which are the universities conducting forestry courses.

PART II: THE PROJECT

1. Origin

Under the sponsorship of PAF-BOL, the universities with forestry training centres held the Forestry Training Courses First Annual Meeting in Santa Cruz from 9 to 11 November 1994. The meeting had the following Agenda:

- a) Analysis of the Current Situation of Tertiary Education Forestry Science in Bolivia, and
- b) Definition of Guidelines for Institutional Strengthening.

In relation to the tasks established at the first meeting, a follow-up the Second technical Meeting was held in Tarija from 17 to 20 July 1995, which resulted in a joint proposal based on the common objective of achieving "the strengthening of forestry research, education and training...". The proposal suggested strengthening in four areas:

- Permanent training and specialization programmes.
- Establishment of research programmes.
- Strengthening and implementation of experimental stations.
- Strengthening and implementation of laboratories.

As a result of the conclusions and the analysis of the prospects discussed during the second meeting, and with the intention of avoiding the duplication of efforts and of encouraging a specific subject focus in each course, **ETSFOR was supported and recognised as the institution responsible for developing academic actions in the area of sustainable forest management and utilisation of tropical forests** (the other courses do not deal with the issue).

Finally, a decisive element in the origin of the project was the favourable disposition of the Central Government to promote the strengthening of university forestry training as essential to enabling the country to advance to higher economic growth within the framework of the objective of sustainable forest management and utilisation.

These are the considerations which led to this proposal which sets out the necessary strategy to meet the growing need for professionals with the capacity to implement forestry management actions on the basis of resource sustainability.

It should be pointed out that the original project proposal, revised by the ITTO Panel of Experts, made recommendations which made it possible to clearly specify the objectives of this revised project reformulated by Eng. Mario Escalier, MSc., and Eng. Fimo Alemán D., MSc.

2. Project objectives

Specific objective

To strengthen the technical capabilities of forest professionals in the areas of forest management and harvesting, by increasing the quality of the technical human resources in charge of managing the forests.

3. Project justification

3.1 Problems to be addressed

3.1.1 Human resources for sustainable forest management.

The sustainable management of forest resources will not be possible without forest professionals who have the practical knowledge of techniques and silvicultural systems to minimise the growing danger of forest destruction.

Policy-making and operational actions in the country postulate sustainable management of the forests as contributing to sustainable development. This creates a major problem requiring a wider and better training of professionals, at both degree and advanced technician levels. Through this project, ETSFOR aims at providing advanced forest technicians and forest professionals with the necessary technical reliability which the current circumstances demand.

3.1.2 Training and specialization of forest professionals for the professional market.

The enactment and implementation of the Forestry Law (Law 1700) establishes as policy the development of forest management plans, which will have to be implemented under the responsibility of forestry professionals; it also envisages assessments of the areas under management to be conducted every five years through technical audits.

At the same time, in relation to professional human resources, at present there are 122 forest engineers and 245 forest technicians, whereas the immediate demand is for 620 engineers and 1240 forest technicians. It is estimated that by the year 2005 there will be a demand for 880 forest engineers and 1760 forest technicians.

This immediate and future demand for forest professionals by public and private agencies will also make it necessary to increase training efforts by improving on the levels of those who are currently undertaking courses as well as on the professional levels of qualified and practising foresters.

The specialization of forest technicians is not easily accessible. Due to financial limitations that delay aspirations to attending specialization courses, the availability and opportunity for professionals to refresh and upgrade their knowledge is limited.

At a national level, there are no specialised centres in the forestry field focusing on forest management, and it is for that reason that ETSFOR intends to use all of its potential to develop and start a Specialization Program.

3.1.3 Teaching-training from reality

ETSFOR, as part of the university system, has the institutional mission of contributing to the development and welfare of society, through qualified professionals, through science and through technology, and by transferring all those elements to the engine room driving the national development. This is a challenge which, so far, has not been fully met.

The fact that there is no relationship with the future market which will require the services of forestry professionals is a vital aspect to be resolved. ETSFOR will establish a dialogue with the institutional players involved in the forestry field, particularly in the area of forest management, so as to establish a rapport which will permit furthering the skills of forestry professionals through a specialization program. This dialogue will allow specialisation courses to have real and practical components, opening the way to training in the actual forests where the everyday practical problems of management are experienced.

In the context of the country's projects and institutions, ETSFOR's prestige and credibility will contribute favourably to cooperative efforts on a project dealing with a common interest and need, whereas having better trained human resources will give recognition to the Specialization Program which will provide future continuity well beyond the duration of this project.

3.1.4 Limited economic resources

ETSFOR has limited economic resources and must make efforts towards self-finance. Through student registration fees it obtains US\$ 4,300 per year and through its production units some US\$ 10,000 per year. This money is used to cover basic expenses, including the payment of utilities (telephone, electricity and other).

At present UMSS support is limited to wages and salaries for teaching and administrative staff.

In the beginning and until recently, the support of funding institutions (GTZ, FAO) helped ETFOR by providing the necessary funding for academic practices and the acquisition of material, equipment and mobile equipment, which enable it to fully carry out its educational mission.

The Specialization Program must look into the registration fees, which will cover some of the expenses involved in its implementation. At the same time an admissions policy should be developed.

3.1.5 Infrastructure and laboratories

In relation to infrastructure, ETFOR has adequate space to conduct specialization courses, and there is only the need of an additional building of 500 m² for laboratories and offices for the Specialization Program.

As far as laboratories and production units are concerned, the following are available: Wood Anatomy Laboratory, Computer Laboratory, Nursery, Carpentry Workshop, and sawmill. However, the following items and facilities necessary to implement this project are not available: GIS Laboratory, some equipment for inventory work (compasses, maps, GPS and other), bibliography, and other.

3.1.6 Technical knowledge for sustainable forest management

Until recently, and before enactment of the Forestry Law, logging contracts were often issued in forest utilisation areas without management plans and, generally, in those cases in which any management plans were available they were not implemented since they represented only an administrative requirement for obtaining contracts which granted the rights to log. Nowadays, the new Forestry Law (Law 1700) requires that inventories and management plans be available as an essential prerequisite, and that their implementation be subject to technical audits. However, it should be taken into consideration that there is often no information on the impact of the disturbance caused by forest logging. The specific treatments required to keep the forests in production, depending on the degree of intervention they have suffered, are not known either. It is assumed that species with potential commercial value are being lost. There is no management of the genetic material of these forests, the technological qualities in the timber of the species which form these forests are not known, there is partial knowledge of the silvicultural behaviour of the main species found in the forest, and there is technical uncertainty on how the private sector can implement sustainable forest management and utilisation. However, the challenge is to develop specialised human resources in the area of forest management who will be in charge of the process of implementing those plans and to gradually find the answers to these questions.

3.1.7 Application of the Forestry Law in Sustainable Forest Management

There has been great progress in the implementation of the Forestry Law in relation to regulatory provisions and, as a result, there are the respective regulations as well as eight technical rules. These will clarify to the different players the administrative and technical procedures to be followed. However, the main challenge is that in the land management framework, the lands for forestry use should be gazetted and demarcated so as to enable their classification according to the categories established in the legislation, thus consolidating the forest management approaches to be implemented in them.

In this context, the technically able professionals will be responsible for guiding private sector investments, and for putting forward technically sound and demonstrable arguments at political decision-making levels on forest production feasibility in different regions of the country.

3.2 Characteristics of the area where the project will be located

The Project will develop a Specialization Program with both theoretical and field practice components.

The development of the theoretical component will take place at ETSFOR's facilities in the city of Cochabamba, at the foot of Tunari National Park, in an area of 64,000 m² with buildings which occupy an area of approximately 3,000 m².

The available buildings are: equipped classrooms, administrative and teaching staff areas, technology and dendrology laboratory, specialised library, mechanical and forestry machinery workshop, carpentry workshop and forest nursery.

Field practices will be conducted in the Eastern lowlands forests in the departments of Santa Cruz, Beni and Pando, but also in the regions of Yungas (Valleys) in La Paz, Chapare in Cochabamba and in the Chaco region. It will be necessary to select the exact locations where field practices will be conducted, and these will be determined on the basis of agreements with the National Forestry Chamber, and in areas under forest concessions. Field practices will also be conducted in areas where projects dealing with different aspects of forest management are being carried out. These include projects such as the BOLFOR Project, the SONIZIG Project, the Chimanes Forest Management Project, the Pílon Lajas Biosphere Reserve Project, and other projects to be identified.

3.3 Other relevant aspects of the "pre-project situation"

It is obvious that the current forestry courses syllabuses do not provide sufficient training to the professionals who complete them, limiting their ability to fully implement forest management. This is exacerbated by the lack of updating on new concepts on the subject, and the lack of sufficient field training. It is also evident that the forestry courses are isolated, which dissociates forestry education from the interests and concerns of the players and practitioners who operate in the actual forest.

The above-mentioned aspects indicate to ETSFOR the need to coordinate professional training with the different areas of the dynamic forestry field, which is being stimulated by the new institutional forestry structures of the State as well as by the actions of the business sector and by the projects operating in several regions of the country and in different areas of forestry.

This project will provide critical content to these interactions and will support the joining of efforts towards an alliance aimed at reaching a common goal, although in reality the various players are responding to different interests as follows:

- ETSFOR is committed to contributing to the improvement of the quality of forest technicians, realising that this commitment will lead to its own strengthening;
- The business sector is interested in minimising investment risks and obtaining better yields from forest management, within the framework of compliance with Law 1700;
- The projects related to the matter are interested in disseminating and transferring the practical knowledge acquired in the area of forest management, with the aim of having a bigger impact through their actions.
- The State institutions, particularly the Superintendency, are committed to carrying out the regulatory roles assigned to them by the Forestry Law.

This symbiosis among institutional players with different, but complementary, roles and interests will bring about the proposed objective of the project, and its positive impact will result in a better management of the country's forests.

The operation of this project will have implications in the implementation of the Forestry Law, due to the fact that without human resources to develop and effectively implement management plans, there will be little chance of achieving the objectives and enforcing the provisions of the aforementioned legislation.

If this project were not to come into operation, the lack of trained human resources would continue, with the real risk that the provisions of the Forestry Law, and its regulations and technical rules would be "excellent documents" which cannot achieve the desired changes to logging practices, which would in turn have a negative effect on the national

economy. At the same time, and because of its own limitations, ETSFOR would continue training technicians under the current conditions and practising technicians would have limited opportunities of enhancing their professional skills. This would influence the private forest sector and its responsibility to manage the forests in a sustainable manner.

3.4 Intended situation after project completion

Upon project completion, the following will have been achieved:

The specialization program on forest management for the Eastern Lowlands of Bolivia will have been developed during three stages. The program's curricula will integrate the theory component with the advanced experiences acquired by the different projects working in forest zoning and classification, inventories, and forest management.

There will be cooperation agreements with projects related to the subject in such a way that part of the Specialization Program actions will be integrated as activities within those projects.

Important institutions, such as the Forest Superintendency and the Ministry, will participate in matters concerning rules and regulations respectively.

Agreements will have been established with important universities internationally renowned for their training of forestry professionals, obtaining their support in the exchange of teachers and their participation in the development of the Specialization Program.

Considering all of the above, 200 forestry professionals, at degree and advanced technician levels, will be trained under the Specialization Program.

3.5 Beneficiaries

There will be direct and indirect beneficiaries. The direct beneficiaries can be identified in the academic field and represented by:

Forestry professionals with engineering degrees and advanced technicians who are targeted by the Specialization Program courses.

The indirect beneficiaries will be:

ETSFOR, which will be strengthened so as to meet its objectives of producing trained technicians and thereby contributing to forestry development in the country.

The private business sector, the NGOs and the projects, which will be able to rely on the services of professionals specialized in forest management.

State public institutions which are responsible for the administration of the National Forest Regime, such as the Forestry Superintendency, the Municipalities, the Prefectures and the relevant Ministries.

3.6 Project strategy

3.6.1 Reasons for selection

The Government of Bolivia, aware of the limited resources it has available to energise its development axes, is working together with institutions in the country (public, private and other) in order to be as efficient as possible in identifying the areas requiring foreign cooperation for the purpose of investing in the highest priorities. In this sense, this project has been identified by the National Government as a high priority action in the enforcement of the Forestry Law.

The difficulties in responding to the technical problems resulting from the sustainable management and use of forest resources will only be overcome with trained professionals. In this respect, the universities are given the task of carrying out this mission and, with respect to this project, ETSFOR assumes that responsibility.

The project, which seeks to contribute to sustainable forest management by enhancing the capacity of forest technicians, will develop a Specialization Program. This program will have three modules to be developed each year, and the duration of each module will be three months. The modules will be sequential and will have a certain number of subjects which will include a theory component and related practices. Each module will be designed to fully cover a subject area.

Several options will be available to specialization program students. In this way, the students will be able to study the three modules consecutively, or if they so choose, study one of the modules and not the others, or take a certain number of subjects they are interested in.

This will make it easier for them, depending on the available time and resources of the forest technicians concerned, to strengthen their knowledge in the subject areas they are mostly interested in without the time-consuming efforts required by a master's degree, post-graduate course or specialisation outside the country, and without losing touch with the national forestry situation which is an inherent result of attending courses abroad.

The specialization program teaching staff will include ETSFOR teachers; specialised and recognised professionals working in projects related to the subject, whose participation will be specifically related to the experiences they have acquired; and foreign professionals who will be invited for short and specific periods.

The Specialization Program will make it possible for institutions and forestry professionals to undertake further training at an affordable cost. This will provide direct educational and training benefits in the actual environment where their activities are being carried out.

It should be pointed out that there are currently no university courses specialising in forest management. From time to time, seminars are conducted but they deal superficially with the subject and do not reach the levels of courses.

3.6.2 Lessons drawn from past evaluations

ETSFOR has focused its efforts in the training of forestry technicians at an advanced level and now, through the Specialization Program, wants to provide better education to the graduate professionals, and thus contribute to forestry development in the country.

In general, forestry professionals and technicians have few alternatives for further training. The available opportunities involve cumbersome selection processes due to the few places available, and institutions rarely encourage further training because of, among other things, the costs involved in specialization courses abroad and the need to go on secondment for long periods of time. The courses offered at a national level last a long time (a two-year master's degree) and the subjects offered at a master's level and in specialised courses do not deal specifically with forest management.

Furthermore, the above is exacerbated by the higher demands and responsibilities placed on forestry professionals by the Law, and the challenge in the face of skepticism from some groups in society about the truthfulness of being able to achieve sustainable management of the forests and at the same time business profitability.

3.6.3 Technical and scientific aspects

The current basic program offered by ETSFOR is of a general nature; therefore, the subjects related to the specialization are:

Topography – involving the description of the relief features or surface configuration of geographical areas, including topographic surveys and area estimates.

Forest inventory – with an emphasis on Andean ecosystems.

Silviculture – involving the characterisation of the forest vegetation including identification of growth parameters and forest dynamics with a view to the productive management of reforested stands. Silvicultural treatments, maintenance and management of forest stands are also addressed.

Other subjects related to forest management include forest harvesting, forest roads, forest economics, and forest policy and legislation.

Each of the three specialization modules proposed will focus on a central subject matter which will be developed through topics that will complement each other and together will form a unit, i.e. a module.

Program modules and curricula will be structured as follows:

CURRICULAR PROGRAM

MODULE I. GEOGRAPHIC INFORMATION SYSTEMS AND REMOTE SENSING

1. GIS and data base management

Introduction; Advantages; Disadvantages; Types of data; Structure; Geographic data; Data entry; Remote sensors.

2. Remote sensing in forest management

Remote sensing principles; Imagery characteristics; Visual inspections and sensing systems; Spectral behaviour of materials; Image processing.

3. Geodesic coordinates system

GPS operation; System components; Error sources; Receivers for mapping; Differential correction; Coordinate management; GPS use and application; GIS applications.

4. Development of thematic maps

Use of pre-developed data on base location map; vegetation or forest cover map (forest map); administrative units or divisions map; production forest behaviour or sub-behaviour map; operational maps for harvesting and silvicultural operations.

MODULE II. FOREST INVENTORY PLANNING

Case study: Sub-tropical moist forest

Location: Sacta Valley and other tropical and sub-tropical ecosystems

1. Forest inventory planning, design and implementation

Statistical parameters and sampling; Shape and size of sampling units; Sampling methods; Systematic sampling design.

2. Photo-interpretation and development of GIS maps

Base location maps; Vegetation or forest cover maps (Forest Maps); Administrative units or divisions maps; Production forest behaviour and sub-behaviour maps; Operational maps for harvesting and silvicultural operations.

3. Programs and processing of inventory data

Programs for BOLFOR forest inventories and other software.

4. Forest surveys and operational harvesting plans

Interpretation and implementation of forest inventory results. Criteria to determine cutting cycles, annual allowable cuts and annual coupes.

5. Preparation of field work and office report on problem-case studies.

MODULE III. DEVELOPMENT OF MANAGEMENT PLANS

1. Technical standards for the development of management plans

Existing technical standards (ministerial resolutions). General management plan (at the company, social group and area levels). General description. Socio-economic and population aspects. Forest inventory. Management systems. Flexibility of technical standards.

2. Management

Cutting cycle. Harvesting provisions. General provisions on non-timber products. General provisions on silvicultural operations.

3. Planning and evaluation of forest harvesting

Planning of harvesting operations. Cost reduction and efficiency increase. Damage control. Sources of disturbance. Roads and environmental impact mitigation. Skidding and sources of disturbance. Landing and camp sites.

4. Interpretation and application of forest inventory results

Inventories. Data management and interpretation of problem cases.

5. Guidelines for the establishment of permanent monitoring plots (PMP)

Objectives. Number of plots. Size and shape of PMPs. Sub-division of PMPs. Permanent demarcation. Tree marking/measurement.

6. Development of annual operational forestry plan

Annual operational harvesting plan. Low-impact forest harvesting. Annual operational silvicultural plan.

7. Financial analysis of management plans

Income. Expenditure. Management costs (pre-harvesting and harvesting activities). Sawmilling costs. Administration. Marketing.

Specialization Program students taking all the courses in a module will need to attend on a full-time basis. Course contents will involve 40% theory and 60% practice.

The aim of the Specialization Program is to reach, and benefit, the highest possible number of forestry professionals, and to this end it will offer flexible arrangements that will be equally demanding in academic terms. Therefore, as previously indicated, in order to attend the Specialization Program, students will have the following optional arrangements from the beginning:

1. to study the three modules sequentially;
2. to study a module of their choice;
3. to study only some subject(s).

For option (1), admission will be subject to an entrance examination to the first module. Completion of the module qualifies the student to attend the modules that follow. The academic qualification to be issued will be Specialist in the Planning and Use of Forest Resources.

For option (2), the applicants, depending on their professional interest, will have the opportunity of studying any module after passing an entrance examination. The academic qualification to be issued at the end of the course will be a Certificate of Completion of the relevant module.

For option (3), the applicants, depending on their professional interest, will be able to attend one or more separate subjects of their choice, and admission will require only enrolment. The academic qualification to be issued, a Certificate of Completion, will note the subjects studied.

3.6.4 Economic Aspects

The cost involved in undertaking a master's course abroad ranges from approximately US\$20,000 to US\$25,000 per professional. The costs of short-term courses (three to five months) are also high, and are estimated at between US\$5,000 and US\$7,000 per student.

The Forest Management Specialization Program proposes the optimisation of the costs involved in upgrading professional skills. The proposal is based on bringing experts from abroad instead of sending students abroad, and would lower the financial costs considering the number of professionals who would benefit from the Specialization Program.

The upgrading of professional skills is an investment in human resources whose economic impact will result in the efficient utilisation of the forest resource and financial benefits to business, preserving for the future a sustainable financial income as the result of the sustainable management of forests.

Also, it must not be forgotten that provided that forest use is adequately planned, the approximately 30,000 jobs the forestry sector generates at present will be maintained and, in all likelihood, more job opportunities will be created.

3.6.5 Ecological/environmental aspects

The project involves upgrading the knowledge and skills of forest professionals and has no direct effect on the environment because its actions will be developed at an academic level.

However, it must be recognised that when designing and implementing forest management plans, or when practising their profession, the professionals who come out of the Specialization Program will have the capacity and responsibility to take into account and undertake preventative action to minimise negative environmental impacts. For this reason the specialization program syllabuses will also include training in the areas of assessment and strategies for mitigating the environmental impact of forest management actions.

3.6.6 Social aspects

During the Second Technical Meeting (held in July 1995), the country's universities sector, and particularly the forestry courses, expressed the need to strengthen professional education through postgraduate and specialised training, among other things. It is in this context that ETSFOR assumes the responsibility of implementing this proposal in the area of forest management.

In order to have a forum in which concerns may be expressed within the framework of the project's objectives, the project will establish formal links with private and public institutions involved in forest management, through a Consultative Committee.

Through agreements with the National Forestry Chamber and its associates, there will be support for joint actions with projects related to forest management, with public forest institutions and with foreign academic institutions.

With respect to measures related to establishing contacts with local communities, it should be pointed out that because of the nature of the project the specialization courses curricula will take into consideration the importance, the procedures and the use of social and economic information in the design of forest management plans.

3.6.7 Managerial aspects

UMSS (Universidad Mayor de San Simón) has a central administration which supports its faculties and courses, that is, an infrastructure appropriate to its size.

Because of this, the project will have its own decentralised and autonomous administration which will operate under ITTO or UMSS rules and procedures, depending on the degree of funding it is managing. Apart from that, just like the project, it too will operate continuously without any of the possible interruptions that could occur at the university.

This will facilitate the implementation of the Specialization Program within the established dates, strengthening its credibility, and enabling the agencies cooperating with the project and those sending students, as well as the professionals interested in the program, to plan without uncertainties.

3.7 Reasons for ITTO support

3.7.1 ITTO aspects

Bolivia is a signatory country to the ITTO Agreement and it has implicitly reaffirmed its firm decision to achieve the objectives of the Agreement by stating specifically in Article 11 of the Forestry Law:

"The implementation of the National Forest Regime shall take place in consonance with the international agreements which Bolivia is party to, in particular, the International Tropical Timber Agreement (ITTA)..."

An important reason to request assistance from ITTO is the strong manner in which the objective of this project would contribute to ITTO's Year 2000 Objective which aims at achieving "all exports of tropical timber from sustainably managed sources".

Another reason is that the "Promoting Sustainable Forest Management in Bolivia" Mission, conducted by ITTO in 1996 at the request of the Government of Bolivia, indicated that in order to achieve sustainable forest management in the country there was a need to bolster human resources and universities and mentioned ETSFOR for the training of foresters.

In addition, ITTO is approached because of the nature of the Organization's specific cooperation in relation to tropical timber and its open approach in relation to timber trade as a compatible part of sustainable management and the economic growth of the forest sector within the national economy.

3.7.2 Relationship to relevant actions supported by other donors

The four universities which conduct forestry courses (including ETSFOR), together with PAF-BOL and the Executive Committee of the Bolivian University tabled for information purposes the document "Report of Results and Conclusions of the Second National Meeting for Strengthening Forestry Science Higher Education in Bolivia", published in July 1995. ETSFOR has not made any other subsequent approaches, except to ITTO.

In relation to this project, there have been no contacts, commitments or on-going negotiations with any other cooperation agency.

3.8 Risks

It is important to muster the interest of internationally recognised forestry training institutes and universities in establishing a relationship with ETSFOR within the framework of the project so as to improve the quality of the Specialization Program. This will help in gaining credibility and recognition and projecting a good image at the national institution and forestry professional levels and represents a crucial aspect in the success of the project.

Another risk is the lack of policies among institutions and projects operating in the country for fostering and strengthening professional human resources. As a result, favourable conditions for forestry officials to attend specialization courses may not be provided. It is very important that those foresters who are employed are given the necessary opportunities so that they do not risk losing their jobs as a result of attending the courses.

Continued project sustainability will be guaranteed with the income generated through tuition fees to be charged for the courses, which will be deposited into a bank account to earn interest. In addition, income will be generated through the products related to the execution of management plans by companies such as research documents (see attached financial sustainability document).

4. OUTPUTS AND ACTIVITIES

4.1 Specific objective 1

To strengthen the technical capabilities of forest technicians in the areas of forest management and harvesting, by increasing the quality of the technical human resources in charge of managing the forests and the utilisation of their products.

Output 1.1.

A refined Specialization Program is available with the support of national and foreign agencies which are defined as contributing to the operation of the project.

Activity 1.1.1

Hire the personnel required within the framework of the project.

Activity 1.1.2

Analyse, table the program and retrieve the "inputs" of contributing agencies.

Activity 1.1.3
Establish the full specialization program.

Output 1.2.

The national and foreign agencies, defined as contributing to the project, assist in the implementation of the specialization courses.

Activity 1.2.1
Identify and propose agreements with foreign agencies involved in the training of professionals.

Activity 1.2.2
Sign agreements with foreign agencies within the framework of the agreement.

Activity 1.2.3
Identify and consult, in a national workshop, the national agencies and projects which are interested and committed to being part of the project.

Activity 1.2.4
Sign agreements with national agencies and projects within the framework of the Project.

Activity 1.2.5
Plan and coordinate timetables, types of experts, and other, through the agreements.

Activity 1.2.6
Evaluate and adjust compliance with the agreements, within the operational plan of each arrangement.

Activity 1.2.7
Circulate information among cooperating agencies about their relationship with and their contribution to the Specialization Program.

Output 1.3.

The university system legally recognises the academic standing of the Specialization Program.

Activity 1.3.1
Submit the Specialization Program to the forestry faculties and to the authorities of the Bolivian University Executive Committee.

Activity 1.3.2
Make arrangements and obtain a resolution on the academic legitimacy of the Specialization Program.

Output 1.4.

National institutions involved in the forest sector and forestry professionals know the objectives and features of the Specialization Program.

Activity 1.4.1
Prepare and disseminate official notification of the Specialization Program through different media.

Activity 1.4.2
Maintain a list of forest technicians and keep them informed about the Specialization Program.

Activity 1.4.3
Keep the sector's institutions and projects informed about the objectives and actions of the Specialization Program.

Activity 1.4.4
Prepare and disseminate publication on the Specialization Program Modules.

Output 1.5.

Three equipped laboratories are available for use by the Specialization Program.

Activity 1.5.1

Build appropriate facilities.

Activity 1.5.2

Acquire the necessary material and equipment.

Activity 1.5.3

Organise, in coordination with the specialization program teaching staff, the teaching material necessary for the development of the subjects.

Activity 1.5.4

Install equipment and supervise the cleaning and maintenance of equipment.

Activity 1.5.5

Coordinate with the companies the practices to be carried out and the availability of time and material.

Output 1.6.

During the project, 9 quarterly modules are developed.

Activity 1.6.1

Organise the teaching staff for each module, within the framework of the agreements signed.

Activity 1.6.2

Coordinate with teachers the detailed contents of each course/subject.

Activity 1.6.3

Prepare a timetable and an academic chart for the development of subjects for each module.

Activity 1.6.4

Prepare entrance tests, examine applicants, advise of results and conduct enrolments.

Activity 1.6.5

Prepare information on contents, academic procedures and schedules for each module, and issue them to enrolled students.

Activity 1.6.6

Develop subjects (theory, practice and field work report) for the module being conducted.

Activity 1.6.7

Conduct closing ceremony and prepare academic report at the conclusion of each module.

Output 1.7.

National institutions, national projects and forest technicians strengthen the relationship between the Specialization Program and the elements required by the specific professional market.

Activity 1.7.1

Conduct Specialization Program presentation workshops and take into consideration the concerns and demands of public and private organisations and projects.

Activity 1.7.2

Conduct workshops with professionals who attended the Specialization Program in order to evaluate and obtain feedback on its contents.

Activity 1.7.3

Introduce changes to the curricular content of the Specialization Program to meet expectations.

5. Activities and inputs

These are presented in the following pages according to the required specifications under the title "Activities and inputs".

It should be noted that the following have been used as the basis for calculation: for average daily subsistence allowance, US\$50/day within the country and US\$100/day abroad; for average travel expenses, US\$100/ticket for national travel and US\$500/ticket for travel abroad.

TABLE OF ACTIVITIES AND INPUTS

PROJECT EXECUTION STAFF		INPUTS	
Group of permanent officers who assume the responsibility for the entire implementation of the project. The inputs used in all the activities are also indicated in general terms.	A Project Director	42M/M	
	Coordinator	42M/M	
	Academic coordinators	84M/M	
	Secretary	45.5M/M	
	ETSFOR Administrator	45.5M/M	
	ETSFOR Teachers	54M/M	
	ETSFOR Caretaker	45.5 M/M	
	ETSFOR Driver	45.5M/M	
	ETSFOR Messenger	45.5 M/M	
	Vehicle	Unit	
	Fuel and oil	14,600lt.	
Office supplies	Miscell.		
Vehicle spares	Miscell.		
OUTPUTS AND ACTIVITIES		INPUTS	
Output 1.1.			
1.1.1	Hire the personnel required within the framework of the project.	Publish announcement Contracts-Lawyer	2 publicat. 3 contracts
1.1.2	Analyse, table the program and retrieve the "inputs" of contributing agencies.	2 officers 2 officers Phone/fax & photocopies	5 days DSA. 2 air fares Units
1.1.3	Establish the full specialization program.	Printing subcontract	700 leaflets
Output 1.2.			
1.2.1	Identify and propose agreements with foreign agencies involved in the training of professionals.	2 officers 2 officers Mail, phone/fax	20 days DSA. 6 air fares Units
1.2.2	Sign agreements with foreign agencies within the framework of the agreement.	2 officers 2 officers Mail, phone/fax, photocopies	10 days DSA. 4 air fares Units
1.2.3	Identify and consult, in a national workshop, the national agencies and projects which are interested and committed to being part of the project.	2 officers 15 persons 2 officers 15 persons National consult. Workshops Phone/fax	7 days DSA 3 days DSA 3 air fares 30 air fares 1M/M
1.2.4	Sign agreements with national agencies and projects within the framework of the Project.	2 officers 2 officers Mail, phone/fax, photocopies	20 days DSA 6 air fares
1.2.5	Plan and coordinate timetables, types of experts, and other, through the agreements.	3 officers 3 officers Phone/fax	15 days DSA 6 air fares
1.2.6	Evaluate and adjust compliance with the agreements, within the operational plan of each arrangement.	National Consult. Evalua. Mail, phone/fax, photocopies	1M/M
1.2.7	Circulate information among cooperating agencies about their relationship with and their contribution to the Specialization Program.	Mail, phone/fax, photocopies	

OUTPUTS AND ACTIVITIES		INPUTS	
Output 1.3.			
1.3.1	Submit the Specialization Program to the forestry faculties and to the authorities of the Bolivian University Executive Committee.	2 officers 2 officers Phone/fax	6 days DSA 2 air fares
1.3.2	Make arrangements and obtain a resolution on the academic legitimacy of the Specialization Program.	1 officer 1 officer Mail, phone/fax	8 days DSA 8 air fares
Output 1.4.			
1.4.1	Prepare and disseminate official notification of the Specialization Program through different media.	Publish announcement	2 publicat.
1.4.2	Maintain a list of forestry professionals and keep them informed about the Specialization Program.	Phone/fax	
1.4.3	Keep the sector's institutions and projects informed about the objectives and actions of the Specialization Program.	Mail, phone/fax, photocopies	3 M/M
1.4.4	Prepare and disseminate publication on the Specialization Program for each arrangement.	National consult. to prepare publication each year. Printing subcontract Mail	300 copies
Output 1.5.			
1.5.1	Build appropriate facilities.	National Consult. supervisor Building subcontract 500 m ²	1M/M
1.5.2	Acquire the necessary material and equipment.	GIS laboratory Photointerpret. lab. Invent. & manag. Lab. Furniture & fittings LANSAT Satel. Images Spares Aerial photographs IGM charts and various maps Phone/fax	miscellaneous equip. Miscellaneous equip. miscellan. equip. miscellaneous 16 quadrants miscellaneous
1.5.3	Organise, in coordination with the specialization teaching staff, the teaching material necessary for the development of the subjects.	Phone/fax	
1.5.4	Install equipment and supervise the cleaning and maintenance of equipment.	Installation and maintenance subcontract	Install./mainten.
1.5.5	Coordinate with the companies the practices to be carried out and the availability of time and material.	2 officers 2 officers Phone/fax	27 days DSA 10 air fares

OUTPUTS AND ACTIVITIES		INPUTS	
<u>Output 1.6.</u>			
1.6.1	Organise the teaching staff for each module, within the framework of the agreements signed.		
1.6.2	Coordinate with teachers the detailed contents of each subject.	2 officers 2 officers Phone/fax	72 days DSA 18 air fares
1.6.3	Prepare a timetable and an academic chart for the development of subjects for each module.		
1.6.4	Prepare entrance tests, examine applicants, advise of results and conduct enrolments.	Photocopies	
1.6.5	Prepare information on contents, academic procedures and schedules for each module, and issue them to enrolled students.	Photocopies	
1.6.6	Develop subjects (theory, practice and practical tasks report) for the module being conducted.	200 students 200 students Field workers 10 workers x 20 days x 3 Mod.I 21M/M 20 workers x 20 days x 3 Mod.II 10 workers x 10 days x 3 Mod.II Photocopies	20 days salary 400 fares (land travel) 42M/M 42M/M units
1.6.7	Conduct closing ceremony and prepare academic report at the conclusion of each module.		
<u>Output 1.7.</u>			
1.7.1	Conduct Specialization Program presentation workshops and take into consideration the concerns and demands of public and private organisations and projects.	20 persons 20 persons National Consultant	3 days DSA 2 air fares 1M/M
1.7.2	Conduct workshops with professionals who attended the Specialization Program in order to evaluate and obtain feedback on its contents.	50 former students 50 former students National Consultant	2 days DSA 2 fares 1M/M
1.7.3	Introduce changes to the curricular content of the Specialization Program to meet expectations.	Interna. Expert Interna. Expert Photocopies	4 air fares 2M/M units

6. Logical Framework Worksheets

These are presented in the following pages under the heading “Logical Framework Matrix”, and include Objectively Verifiable Indicators, Means of Verification and Important Assumptions.

7. Work Plan

The project's Work Plan is presented in the following pages, indicating project activities and timetable. Also, a logical framework matrix is shown, including OVIs, means of verification and assumptions for the achievement of outputs.

LOGICAL FRAMEWORK MATRIX

PROJECT COMPONENTS	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Development objective: To contribute to the struggle against misuse, deterioration and degradation of the country's tropical forests by improving the processes of drawing up and implementing management plans, based on the principle of preserving the sustainability of the forest resource.</p> <p>Specific objective : To strengthen the technical capabilities of forest technicians in the areas of forest management and utilisation, by increasing the quality of the technical human resources in charge of managing the forests.</p>	<p>Production forests are under forest management, implemented by technically skilled professionals.</p> <p>200 forest technicians benefit from Specialization Program. At least 50% of specialization program students work or have worked in areas related to their training.</p>	<p>Forestry Superintendency has audit reports.</p> <p>Specialization Program student registers and files. Relationship with the organisations where they work and duties of their positions.</p>	<p>Government policy fully supports sustainable forest management.</p> <p>Institutions and projects facilitate participation in Specialization Program. Cooperation agencies provide scholarships to technicians, encouraging more participants.</p>
<p>Output 1.1. A refined Specialization Program is available with the support of national and foreign agencies which are defined as contributing to the operation of the project.</p> <p>Activities. 1.1.1 Hire the personnel required within the framework of the project.</p>	<p>The initial program contains more than 20% of the suggestions of the contributing institutions.</p> <p>Key staff are hired.</p>	<p>Report. Comparing proposed program with programs developed in each module.</p> <p>Contracts</p>	<p>Inputs from contributors are available within adequate timeframe.</p> <p>No assumptions.</p>
<p>1.1.2 Analyse, table the program and retrieve the "inputs" of contributing agencies.</p> <p>1.1.3 Establish the full specialization program.</p> <p>Output 1.2. The national and foreign agencies, defined as contributing to the project, assist in the implementation of the specialization course.</p>	<p>Program sent and suggestions received.</p> <p>A document containing the complete Specialization Program.</p> <p>At least six agreements signed and satisfactorily implemented. At least two agencies which signed agreements are involved in the operation of each module.</p>	<p>Notes sent and received. Program modified.</p> <p>Document.</p> <p>Agreements and compliance reports. Reports and academic chart per module.</p>	<p>There is interest in maximising the quality of the Specialization Program.</p> <p>No assumptions.</p> <p>Institutions that agree with the importance of the Specialization Program are given the go ahead by their sponsors and decide to contribute.</p>

PROJECT COMPONENTS	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Activities. 1.2.1 Identify and propose agreements with foreign agencies involved in the training of professionals.	Correspondence established and agreements proposed.	Proposals and correspondence filed.	No assumptions
1.2.2 Sign agreements with foreign agencies within the framework of the agreement.	Agreements signed.	Agreements.	Foreign organisations are interested in contributing.
1.2.3 Identify and consult, in a national workshop, the national agencies and projects which are interested and committed to being part of the project.	Workshop conducted and organisations which will support the project are known.	Workshop notes. Index cards of organisations according to type of support.	Institutions invited find workshop desirable and participate.
1.2.4 Sign agreements with national agencies and projects within the framework of the Project.	Agreements signed.	Agreements.	There is commitment and favourable conditions for the signing of agreements.
1.2.5 Plan and coordinate timetables, types of experts, and other, through the agreements.	Detailed register of the terms of each agreement.	Reports and registers.	There is a good level of communication among delegates in relation to the agreements.
1.2.6 Evaluate and adjust compliance with the agreements, within the operational plan of each arrangement.	Agreement assessment report and operational proposals for improvements.	Report and proposals sent to institutions which are signatories to the agreements.	Disposition of institutions signatories to the agreements improves.
1.2.7 Circulate information among cooperating agencies about their relationship with and their contribution to the Specialization Program.	Information sent to institutions which are signatories to the agreements.	Information and official receipts of delivery.	No assumptions.
Output 1.3. The university system legally recognises the academic standing of the Specialization Program.	Resolutions of recognition from San Simón University and the Bolivian University Executive Committee.	Resolutions.	University authorities support initiative.
Activities 1.3.1 Submit the Specialization Program to the forestry faculties and to the authorities of the Bolivian University Executive Committee.	Presentation document. Report. Information delivered.	Document and report. Official receipts of delivery.	A congress is held during the life of the project.
1.3.2 Make arrangements and obtain a resolution on the academic legitimacy of the Specialization Program.	Resolution officially issued.	Resolution.	No assumptions.

PROJECT COMPONENTS	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Output 1.4. National institutions involved in the forest sector and forestry professionals know the objectives and features of the Specialization Program.	At least 80% of organisations and professionals received information on specialization program more than 3 times.	Register of information delivery and reference tables. Official receipts.	Correspondence is delivered on time.
Activities 1.4.1 Prepare and disseminate notifications of the Specialization Program through different media.	Dissemination in the press. Notification drafted.	Payment contract for dissemination. Press clippings.	No assumptions.
1.4.2 Maintain a list of forestry professionals and keep them informed about the Specialization Program.	Prepare list of addresses. Receipts of information delivery.	Files. Official receipts of delivery.	Professionals are interested and provide their addresses.
1.4.3 Keep the sector's institutions and projects informed about the objectives and actions of the Specialization Program.	List of organisations to which information is sent and registration of deliveries.	Reports, lists and registers.	No assumptions.
1.4.4 Prepare and disseminate publication on the Specialization Program for each arrangement.	An annual memorandum about the Specialization Program is published and sent to institutions.	Memorandum document and official receipts of delivery.	No assumptions.
Output 1.5. Three equipped laboratories are available for use by the Specialization Program.	GIS, photo-interpretation and mapping, as well as inventories and management labs; equipment installed and in operation.	Lab inspection. Reports.	Equipment and materials are of good quality.
1.5.1 Build appropriate infrastructures.	Construction work.	Visit building.	No assumptions.
1.5.2 Acquire the necessary material and equipment.	Equipment and sale receipts.	Same documents filed.	Funds available at the appropriate time.
1.5.3 Organise, in coordination with the specialization program teaching staff, the teaching material for the development of the subjects.	Lists of the types of material to be used in each subject. Verification report at the beginning of the course.	Reports with lists.	No assumptions.
1.5.4 Install equipment and supervise the cleaning and maintenance of equipment.	Reports, cleaning requests, and clearance or complaint notes.	Notes issued.	Availability of professional services doing a good job.
1.5.5 Coordinate with the companies the practices to be carried out and the availability of time and material.	Agreements according to practices.	Reports and confirmations.	Industry performance is normal, and there are no alterations to agreements.
Output 1.6. During the project, 9 quarterly modules are developed.	Implementation of 3 stages of the	Report and operational plan	Institutions renowned for specialization

PROJECT COMPONENTS	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Activities 1.6.1 Organise the teaching staff for each module, within the framework of the agreements signed.	Specialization Program, with their 3 consecutive modules.	documents.	training in forestry provide support.
1.6.2 Coordinate with teachers the detailed contents of each subject.	Schedule of teachers listing source institutions and profiles.	Report on schedule of teachers per module.	Willingness of officers to make agreements viable.
1.6.3 Prepare a timetable and an academic chart for the development of subjects in each module.	Reports and contents agreed.	Reports and contents.	There is a willingness to cooperate.
1.6.4 Prepare a timetable and an academic chart for the development of subjects in each module.	Timetable and chart.	Documentation filed.	Support from field projects and industry.
1.6.4 Prepare entrance tests, examine applicants, advise of results and conduct enrollments.	Tests held. Lists with results. Registration of enrolled students.	Files, lists and registers.	No assumptions.
1.6.5 Prepare information on contents, academic procedures and schedules for each module, and issue them to enrolled students.	Information prepared and receipt notes signed.	Register with receipt notes.	No assumptions.
1.6.6 Develop subjects (theory, practice and practical tasks report) for the module being conducted.	Contents reports and documentation developed.	Reports and documentation.	Fast communication links with field practice regions
1.6.7 Conduct closing ceremony and prepare academic report at the conclusion of each module.	Nine closing records filed. Nine reports submitted.	Files. Documents filed.	No assumptions.
Output 1.7. National institutions, national projects and forestry professionals strengthen the relationship between the Specialization Program and the elements required by the specific professional market.	The number of applicants to the Specialization Program increases. More than 50% of operational organisations and former students give the program a classification higher than 5 for its relevance.	Application forms. Lists of students. Applications from institutions for places. Completed surveys and reports.	Organisations and professionals are aware of the situation and are keen that the Specialization Program become a tool for providing answers to real needs.
Activities. 1.7.1 Conduct Specialization Program presentation workshops and take into consideration the concerns and demands of public and private organisations and projects.	A workshop conducted with the participation of the most important public and private institutions.	Working document from the workshop. List of participating institutions.	Invited organisations are interested and attend workshop.
1.7.2 Conduct workshops with professionals who attended the Specialization Program in order to evaluate and obtain feedback on its contents.	A workshop conducted with the participation of 80% of former students.	Workshop notes. List of participants.	Former students have the time available to attend.

PROJECT COMPONENTS	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
1.7.3 Introduce changes to the curricular content of the Specialization Program to meet expectations.	Reports and a minimum of 25% of the original content is modified.	Original document compared with modified version.	No assumptions.

WORK PLAN

OUTPUTS /ACTIVITIES	YEAR 1 MONTHS												YEAR 2 MONTHS												YEAR 3 MONTHS												YEAR 4 MONTHS						
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	
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1.7.2																																											
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8. INSTITUTIONAL ARRANGEMENTS FOR PROJECT EXECUTION AND OPERATION

8.1 Management structure

The project will have a Steering Committee and a Consultative Committee.

The Steering Committee will be the highest management level of the project and will be chaired by the UMSS through the ETSFOR Director. Its members will include two representatives from the Prefecture of the Department of Cochabamba, a representative from the Municipalities, and the National Project Director. The National Secretariat for Natural Resources and Environment of MDSMA will also participate in this Committee through PAF-BOL.

The National Project Director and the Academic Coordinator will have direct and operational responsibility for the project. The former will be appointed by selection on merit and the latter by the University Council on recommendation of the Faculty and Academic Council of ETSFOR. They will both constitute the Project's Executive Board. The Academic Coordinator's salary will be paid by the UMSS, but should receive some additional remuneration from ITTO contribution.

The Consultative Committee will be made up of representatives from the communities, forest companies, the College of Forest Engineers, and representatives of the NGO network.

The Organisational Chart appears in Annex 1.

8.2 Future operation and maintenance

ETSFOR, an established institution in the national and in Cochabamba's institutional framework, will provide institutional support for the project.

The establishment of a Research Department within ETSFOR will consolidate the integrated functioning of all productive units around the pilot centre, and all the equipment, tools and materials acquired by the Project will be under the responsibility of this Department.

The human resources required for the continued implementation of activities after project completion will be provided for in the university's budget and will be guaranteed by ETSFOR's policy regarding unpaid work in productive units to be carried out by students. In addition, the project will generate income through the marketing of management products.

The involvement of the private forest sector, the Departmental Government and Municipalities will also be ensured so that these parties can provide future financial support for project activities.

8.3 Key staff

The key staff necessary for the implementation of the project will be as follows:

- A National Project Director who must be a professional with a Degree in Forestry Science and a Master's Degree in a forest-related field, preferably forest management.
- An Academic Coordinator, who will be the Head of the Research Department and will coordinate project activities in the academic field.
- A forest professional specialised in GIS.
- A forest professional specialised in forest product technology.
- A forest professional specialised in tropical forest management.

Terms of Reference for key staff to be hired appear in Annex 2.

9. Prior obligations and prerequisites

The following are essential:

- A budget allocation from the University and University Council's resolution stipulating the decentralisation of future project administration.
- Signing of inter-institutional agreement between UMSS and the Prefecture of the Department of Cochabamba and MDSMA.

10. Possible future actions

Given the scope of project objectives, once the project is completed after the allocated period of 3 years, a second phase will be required as a follow-up, since this first stage will only lay the foundations for the research to be done and for the efficient work of ETSFOR's internal structures. Furthermore, it is recommended that a minimum of three training cycles be completed (the duration of the whole course is three years). Subsequently, a final phase will be required for the provision of guidance and assistance.

PART III: MONITORING, REPORTING AND EVALUATION

1. Arrangement for reporting

Reports will be submitted to ITTO and to the Steering Committee every six months and at the end of each financial year. This last report will summarise activities for the respective annual operational plan.

Two progress reports will be prepared and submitted to ITTO four weeks before the monitoring visits, and in any other instances as requested by ITTO.

The final report will be submitted to ITTO with the approval of the Steering Committee, as soon as possible and no later than three months following the completion of the project.

Administratively, management and implementation reports will be submitted with the same regularity as the above reports.

2. Monitoring

In order to comply with the monitoring activities, the project will formulate its annual operational plans within the framework of this project proposal and submit such plans for approval by the Steering Committee. The Project's Executive Board will then forward the plans to the appropriate ITTO Division.

Internal monitoring will be carried out on the basis of the annual work plan, the logical framework matrix and the financial implementation stages, all of which will be the responsibility of the project's Executive Board.

The project will be subject to monitoring by ITTO representatives in two instances, on completion of the 12th and the 24th month of the project duration. Administrative and financial monitoring will be subject to the rules and regulations of ITTO and to the rules and regulations applied by the UMSS which are subject to agreements with the Bolivian Government. The project administration will be responsible for the reporting activities.

3. Evaluation

The monitoring missions will determine whether a mid-term evaluation may be necessary. The date for any such evaluation will be agreed upon by ITTO and the Project Steering Committee.

A final evaluation is envisaged six months before the end of the project. It will serve the purpose of evaluating the level of compliance of the project and will identify the lines of action for a second phase of the project.

4. Schedule of events

A tentative programme for monitoring, reporting and evaluation follows:

<u>Description</u>	<u>Dates</u>
- First request for funds	1 January 1998
- First project progress report	1 October 1998
- First monitoring mission	15 November 1998
- Second project progress report	1 August 1999
- Second monitoring mission	15 September 1999
- Final evaluation of the project	20 August 2000

PART IV: BUDGET

The estimated budget is presented in the attached tables, a list of which appears below:

- Budget by Activity (ITTO Contribution in US\$)
- Project Budget by Components - ITTO Contribution in US\$.
- Project Budget by Components - ETSFOR Contribution in US\$
- Consolidated Project Budget in US\$.
- Project Budget by Components - ITTO Contribution per year (US\$)
- Breakdown of Project Staff Costs (ITTO Contribution in US\$)
- Breakdown of Project Staff Costs (ETSFOR Contribution in national currency)
- Capital items – Laboratories, offices, workshops, other. In US\$
- Capital items – Strengthening of pilot centre. In US\$
- List of subcontracts - in US\$.

PROJECT BUDGET BY ACTIVITY (ITTO CONTRIBUTION IN US\$)

Outputs/Activities	Project Personnel	Sub-contracts	Duty Travel	Capital Items	Consumable Items	Miscellaneous	ITTO Monit. & Evaluation	Grand Total
Output 1.1	0	2000	900	0	0	200	0	3100
1.1.1								
1.1.2			900			200		
1.1.3		2000						
Output 1.2	2400	0	21500	0	0	1340	0	25240
1.2.1			8000			200		
1.2.2			4000			100		
1.2.3	1200		4500			100		
1.2.4			2000			90		
1.2.5			3000			300		
1.2.6	1200					150		
1.2.7						400		
Output 1.3	0	0	2200	0	0	90	0	2290
1.3.1			1000			10		
1.3.2			1200			80		
Output 1.4	2100	3000	0	0	0	1350	0	6450
1.4.1								
1.4.2						300		
1.4.3						900		
1.4.4	2100	3000				150		
Output 1.5	1200	31000	3200	60000	10500	390	0	106290
1.5.1	1200	30000						
1.5.2				60000	10500	30		
1.5.3						180		
1.5.4		1000						
1.5.5			3200			180		
Output 1.6	6000	0	19200	0	0	4530	0	29730
1.6.1								
1.6.2			3200			250		
1.6.3								
1.6.4						50		
1.6.5						50		
1.6.6	6000		16000			4180		

Outputs/Activities	Project Personnel	Sub-contracts	Duty Travel	Capital Items	Consumable Items	Miscellaneous	ITTO Monit. & Evaluation	Grand Total
1.6.7								
Output 1.7	47400	0	13000	0	0	100	0	60500
1.7.1	1200		6000					
1.7.2	1200		5000					
1.7.3	45000		2000			100		
	21200			32000	18000	2000	30614	353632
TOTAL	2711000	36000	60000	92000	28500	10000	30614	587232

**PROJECT BUDGET BY COMPONENT -
ITTO CONTRIBUTION IN US\$**

ITEM	DESCRIPTION	AMOUNT US\$
10	PROJECT PERSONNEL	
11	National experts	20000
12	Administrative personnel	12000
13	Consultants	8100
14	Other labour	6000
16	International experts	45000
19	Component total	271100
20	SUB-CONTRACTS	
21	Sub-contract - Construction work	30000
22	Sub-contract - Printing	5000
23	Sub-contract - Installation & maintenance	1000
29	Component total	36000
30	DUTY TRAVEL	
31	Daily subsistence allowance	45000
32	Transport costs	15000
39	Component total	60000
40	CAPITAL ITEMS	
41	Vehicles	32000
43	Capital equipment	60000
49	Component total	92000
50	CONSUMABLE ITEMS	
52	Spares	1500
53	Fuel, oil	10000
54	Office supplies	7000
55	Satellite imagery	10000
59	Component total	28500
60	MISCELLANEOUS	
61	Sundry	10000
69	Component total	10000
70	ITTO MONITORING, EVALUATION, AND ADMINISTRATION	
71	Monitoring and evaluation	30000
72	Administrative costs	29018
79	Component total	59018
80	ITTO PROGRAM SUPPORT	
81	Program support costs on project total (5.5%)	30614
99	GRAND TOTAL	556618

**PROJECT BUDGET BY COMPONENT –
ETSFOR CONTRIBUTION IN NATIONAL CURRENCY**

ITEM	DESCRIPTION	AMOUNT Bs.
10	PROJECT PERSONNEL	
11	National experts	364000
12	Teachers – Specialization Program	297000
13	Administrative personnel	277550
19	Component total	938550
20	SUB-CONTRACTS	
24	Sub-contract INTERNET	13375
29	Component total	13375
30	DUTY TRAVEL	
31	Daily subsistence allowance	214000
39	Component total	214000
40	CAPITAL ITEMS	
42	Land	53500
44	Communication equipment	18457
45	Furniture and fittings	10050
46	Teaching materials	30050
49	Component total	112057
50	CONSUMABLE ITEMS	
54	Office supplies	20000
56	IGM maps and charts	5350
57	Aerial photographs	10700
59	Component total	36050
60	MISCELLANEOUS	
61	Sundry	10700
69	Component total	10700
99	GRAND TOTAL Bs.	1324732
	GRAND TOTAL US\$	240423

Exchange Rate = Bs. 5.51

**PROJECT BUDGET BY COMPONENT –
ITTO YEARLY DISBURSEMENTS (IN US\$)**

Item	COMPONENT	Year 1 (12 months)	Year 2 (12 months)	Year 3 (12 months)	Year 4 (6 months)	TOTAL
10	Project personnel	77457.14	77457.14	77457.14	38728.58	271100.00
20	Sub-contracts	30000.00	2000.00	2000.00	2000.00	36000.00
30	Duty travel	17142.85	17142.85	17142.85	8571.45	60000.00
40	Capital items	92000.00	0.00	0.00	0.00	92000.00
50	Consumable items	15285.70	5285.70	5285.70	2642.90	28500.00
60	Miscellaneous	2857.14	2857.14	2857.14	1428.58	10000.00
70	ITTO Monitoring, Evaluation, and Administration	16862.28	16862.28	16862.28	8431.16	59018.00
99	GRAND TOTALS	251605.11	121605.11	121605.11	61802.67	556618.00

CONSOLIDATED PROJECT BUDGET IN US\$

Item	COMPONENT	ITTO	ETSFOR	TOTAL
10	Project personnel	271100	170335	441435
20	Sub-contracts	36000	2427	38427
30	Duty travel	60000	38666	98666
40	Capital items	92000	20430	112430
50	Consumable items	28500	6624	35124
60	Miscellaneous	10000	1941	11941
70	ITTO Monitoring, Evaluation, and Administration	59018		59018
99	GRAND TOTALS	556618	240423	797041

**BREAKDOWN OF PROJECT STAFF COSTS
(ITTO CONTRIBUTION IN US\$)**

POSITION	M/M	MONTHLY COST	TOTAL US\$
NATIONAL EXPERTS			200000
One Project Director	42	1500	63000
One ETSFOR Coordinator (supplement *)	42	500	21000
Two Academic Coordinators	84	1220	102480
Four ETSFOR Teachers (supplement*)	54	250	13500
ADMINISTRATIVE PERSONNEL			12000
One Secretary	48	250	12000
One Administrator (supplement *)	42	100	
NATIONAL CONSULTANTS			8100
Consultant, National Workshop (act. 1.2.3; 1.7.1; 1.7.2)	3	1200	3600
Consultant to assess Agreements (act. 1.2.6)	1	1200	1200
Consultant to draft Memorandum (act. 1.4.4)	3	700	2100
Consultant, Building (act. 1.5.1)	1	1200	1200
INTERNATIONAL EXPERTS			45000
Consultant, Academic design and training	3	15000	45000
OTHER LABOUR			6000
Workers for field work in Module I	20	100	2000
Workers for field work in Module II	20	100	2000
Workers for field work in Module III	20	100	2000
TOTAL			271100

**BREAKDOWN OF PROJECT STAFF COSTS
(ESTFOR CONT. IN NATIONAL CURRENCY)**

POSITION	M/M	MONTHLY COST Bs.	TOTAL
NATIONAL EXPERTS			364000
One ETSFOR Coordinator	45.5	8000	364000
TEACHERS – SPECIALIZATION PROGRAM			297000
Four ETSFOR Teachers	54	5500	297000
ADMINISTRATIVE PERSONNEL			277550
Administrator	45.5	2000	91000
Caretaker	45.5	1300	59150
Driver	45.5	1500	68250
Messenger	45.5	1300	59150
TOTAL Bs.			938550
TOTAL US\$			170335

Exchange Rate = Bs. 5.51

**CAPITAL ITEMS
(ITTO CONTRIBUTION IN US\$)**

DESCRIPTION	Unit	Unit cost	No. of units	Total (US\$)
VEHICLES				32000
Van (*)	(vehicle)	16000	2	32000
EQUIPMENT				60000
GIS ROOM				37270
Computer, 300Hz, 6.4Gb	equipment	1500	6	9000
Digitizing Table	unit	600	6	3600
Scanner DPI 600	equipment	500	2	1000
Software (Arc View, Arc Info., Micro Station)	program	(various)	3	10000
Satellite Image Processor (ERDAS)	program	3000	1	3000
GPS	equipment	(various)	3	3000
Plotter	equipment	6670	1	6670
Colour Printer	equipment	1000	1	1000
PHOTO-INTERPRETATION ROOM				11050
Digital Planimeter	unit	800	2	16000
Curvometer	unit	50	4	200
Vertical Plotting Machine	unit	3500	1	3500
TOPCON Desk Stereoscope – complete	equipment	1500	3	4500
Pocket Stereoscope	unit	250	5	1250
INVENTORY AND MANAGEMENT ROOM				11680
Computer, 300Hz, 6.4Gb	equipment	1500	3	4500
Brunton Compass	unit	200	6	1200
Altimeter	unit	80	6	480
Long Bed Printer	unit	1000	3	3000
Tape Measure	unit	60	5	300
Binoculars	unit	150	5	750
Radio Equipment	equipment	1300	1	1300
Diametric Tape	unit	15	10	150
TOTAL				92000

Note: (*) Cost free of import duty.

**CAPITAL ITEMS
(ETSFOR CONTRIBUTION IN NATIONAL CURRENCY)**

DESCRIPTION	Unit	Unit cost	No. of units	Total (US\$)
LAND				53600
Lot of land for Specialization Program	m ²	107	500	53500
COMMUNICATION EQUIPMENT				18457
Telephone	line	8025	1	8025
Fax	line	8025	1	8025
Fax equipment	equipment	2407	1	2407
FURNITURE AND FITTINGS				10050
Desks	unit	350	6	2100
Computer tables	unit	450	3	1350
Shelves with doors	unit	600	6	3600
Student desks (tables and chairs)	unit	120	25	3000
TEACHING EQUIPMENT				30050
Overhead Projector	unit	1500	1	1500
Data display equipment	equipment	26750	1	26750
Slide projector	unit	1800	1	1800
TOTAL Bs.				112057
TOTAL US\$				21337.024

Exchange Rate = Bs. 5.51

**LIST OF SUBCONTRACTS
(ITTO CONTRIBUTION IN US\$)**

DESCRIPTION	Unit	Cost/Unit	Total Required	Total (US\$)
SUBCONTRACT, CONSTRUCTION WORK				30000
Subcontract to building company	m ² (constr.)	100	300 m ²	30000
SUBCONTRACT, PRINTING				5000
Subcontract, leaflet printing			1	2000
Subcontract, specialization program publication			1	3000
SUBCONTRACT, INSTALLATION/MAINTENANCE				1000
Subcontract, network, equipment installation			6	1000
TOTAL US\$				36000

Exchange Rate = Bs. 5.51

**LIST OF SUBCONTRACTS
(ITTO CONTRIBUTION IN US\$)**

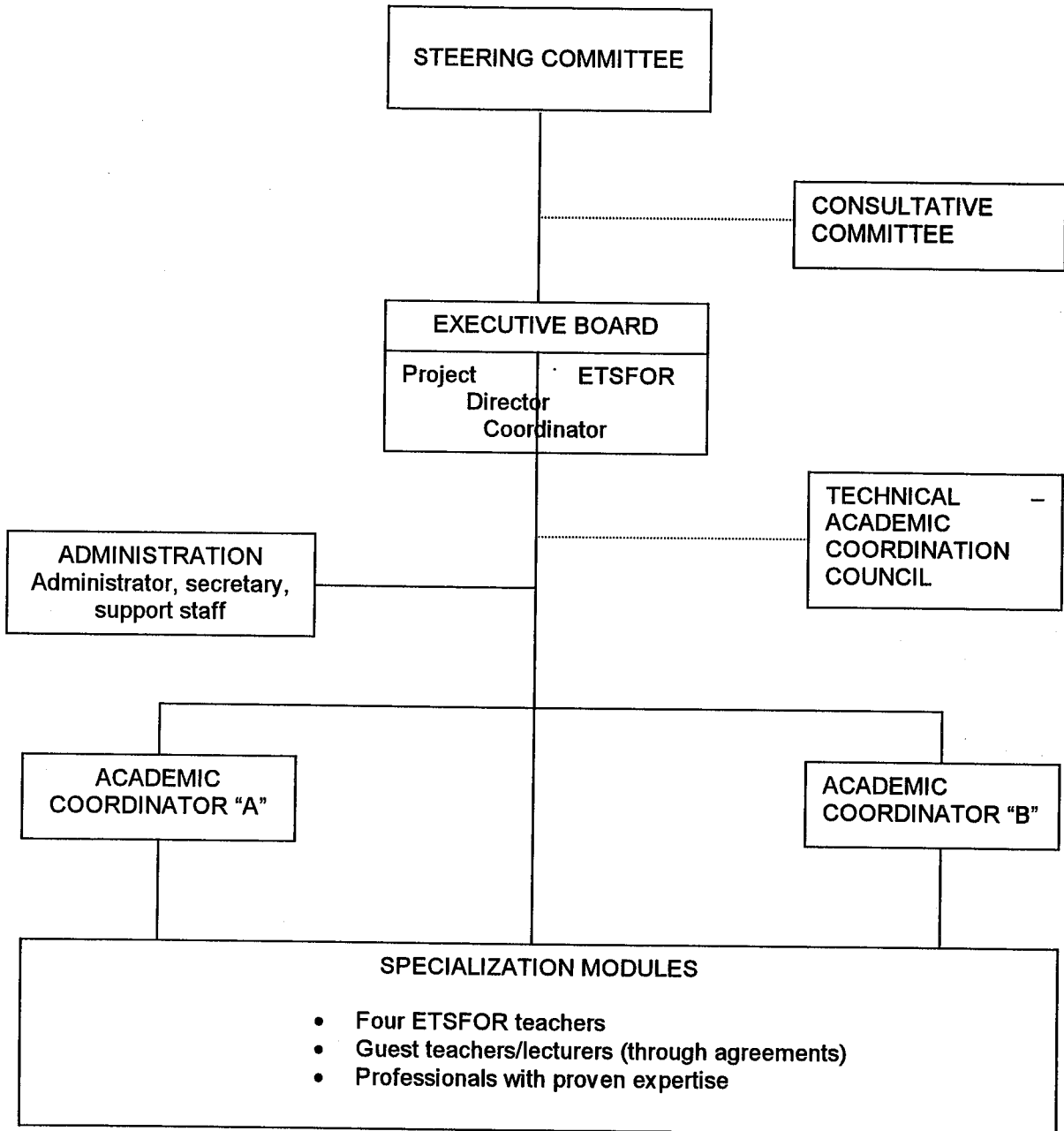
INTERNET Subcontract				13375
	US\$ dollars			2427

Exchange Rate = Bs. 5.51

ANNEX 1

PROJECT ORGANISATIONAL CHART

PROJECT ORGANIZATIONAL CHART



ANNEX 2

**TERMS OF REFERENCE FOR
PROJECT KEY STAFF**

TERMS OF REFERENCE FOR INTERNATIONAL CONSULTANTS

1. The international consultants shall perform the following duties according to project requirements:
 - a. advise national teachers on the academic planning of the Specialization Program for Forest Technicians;
 - b. plan the implementation of forest management practices; and
 - c. receive and mark specialization program reports.
2. Teach a number of subjects to train and optimise the skills of future trainers.
3. Give one or two lectures to professionals and students in the forestry field.
4. Prepare and submit a report on the activities carried out during their consultancy.

TERMS OF REFERENCE FOR PROJECT KEY STAFF

The faculty of ETSFOR and national consultants participating in the project shall perform the following duties according to the technical specifications established:

1. To plan, in conjunction with the international consultants, the implementation and improvement of the program as well as the contents of modules in the Specialization Program for Forest Technicians.
2. To participate in the "training-the-trainers" courses given by the international consultants.
3. To teach in the specialization courses as national counterparts.
4. To implement, together with the specialization program students, forest management practices.
5. To evaluate specialization program reports.
6. To submit activity reports upon the completion of each module.

ANNEX 3

INFORMATION ABOUT ETSFOR

INSTITUTIONAL PROFILE ETSFOR

- 1975 The Government of Bolivia, with international cooperation, conducts a study on the training of Forestry professional. One of the results identifies a lack of training for professional technicians. This fact is the main reason for the establishment of ETFOR.
- 1978 An Agreement is signed between the Government of Bolivia and Germany for the establishment of ETFOR.
- 1979 The physical infrastructure and the provision of equipment are planned for within the framework of the Agreement.

5/5/80 Academic activities begin and the institution is named The Forestry Technical School (ETF).

From the outset this bi-national agreement is executed by GTZ and, at a national level, by the Forestry Development Centre (CDF) which is under the Ministry for Rural Affairs (MACA).

The objective was to train middle level technicians and forest rangers, to be trained for three years and one year respectively.

In the period 1980-82, 40 forest rangers graduated.

The first graduation of technicians took place in 1983 when 29 technicians graduated.

The UMSS conducted an academic analysis and evaluation and graduates were recognised as higher level technicians.

- 1984 CDF transfers ETF permanently to UMSS.
While the University Council is attempting to make a decision, the UMSS places ETFOR under the Faculty of Agronomy.
The Agreement signed by the German government (executed by GTZ) and the government of Bolivia, is assumed in all its terms and conditions by the UMSS.
- 1991 GTZ assessment points out: "in comparison with other forestry training institutions in Latin America, ETFOR occupies a very favourable position in relation to the quality, efficiency and effectiveness of its programme".

ETSFOR Objectives

- Train forestry professionals to fulfil the technical needs relevant to the management of biological processes in the forest, in order to produce goods and services in accordance with our regional and national socioeconomic reality.
- Satisfy the needs for forestry research whenever it is necessary to carry out such activities, in order to generate information which is both reliable and relevant to our situation.
- Develop forestry extension programmes through seminars, talks, courses and other mechanisms at our disposal, in order to make the population aware of forestry issues in the country and in the region.
- Transfer generated or incorporated technology with a view to increasing tangible and intangible benefits, and thereby integrating ecological, economic and social principles.

ETSFOR Academic Penum

The duration of studies to obtain the title of Advanced Forestry Technician is six semesters. It is a day course divided into semesters and has a fixed syllabus.

The study programme includes 34 subjects and an "in-service training period" in order to satisfy graduation requirements. This special period is very important in the technician's training because it requires the submission of a technical report on a subject not previously covered.

The main study areas are: Forest Ecology and Protection, Forest Management and Silviculture, Forest utilisation and Timber Industries, and Agroforestry.

The team of teachers includes six full-time Forest Engineers and six part-time teachers.

ETSFOR Organisational Structure

The highest authority in relation to the course of study is the Course Council, chaired by the Course Director, which has three teacher representatives and three student delegates.

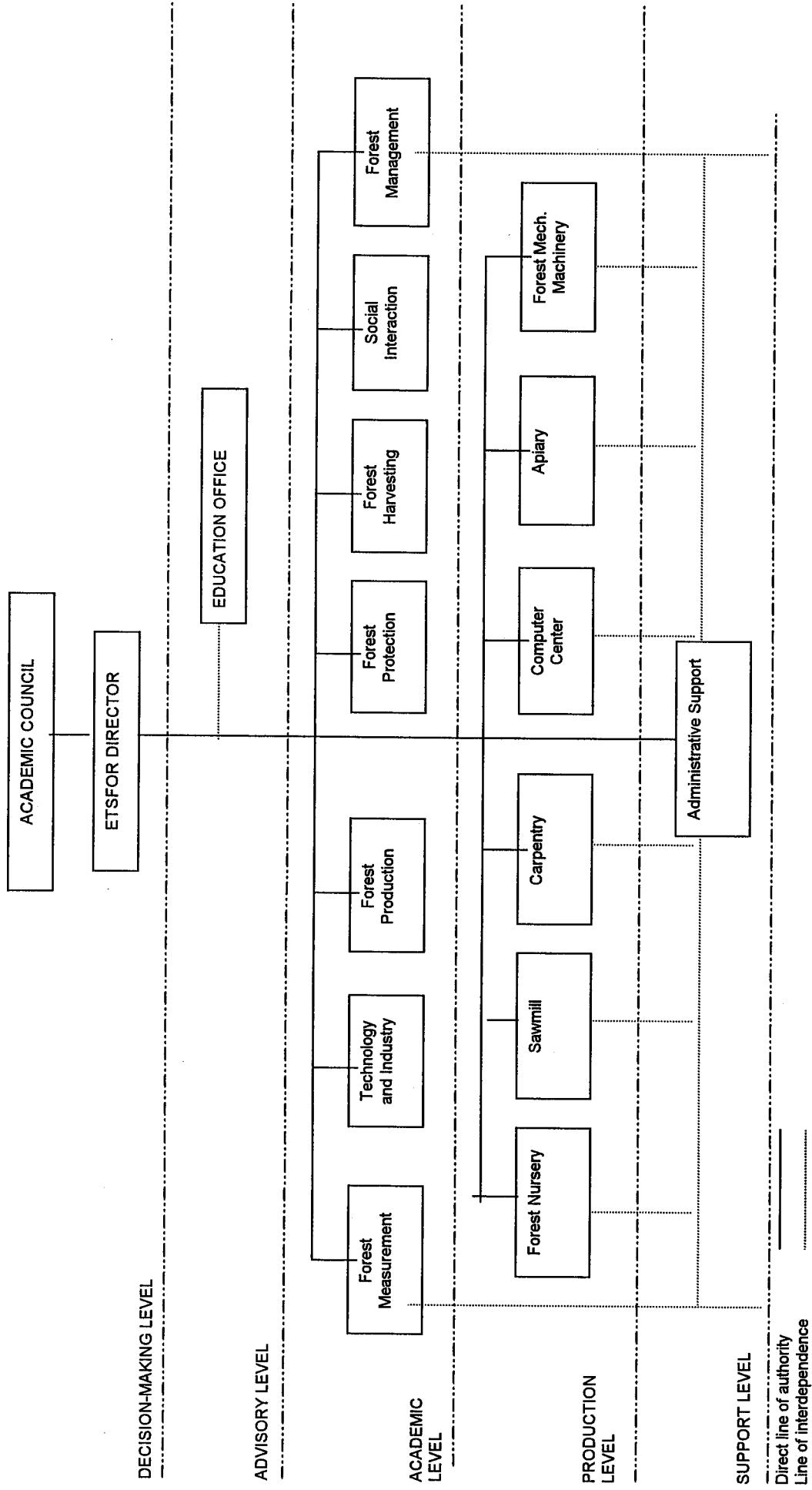
The Course Director is chosen in a university staff ballot.

ETSFOR's Organisational Structure is shown by the Organisational Chart which appears on the following page.

**ETSFOR TEACHING STAFF
1998 ACADEMIC YEAR**

No.	Name of teacher	Subjects	Semester I/98	Semester II/98	Remarks
1	Ing. Mario Escalier	- Watershed Management - Photo-interp. & forest inventory - Forest measurement	X X	X	Full-time teacher
2	Ing. Victor Hugo Achá G.	- Wildlife and protected area manag. - Forest protection	X	X	Part-time teacher
3	Ing. Fimo Alemán D.	- Forest work organisation - Forest roads	X	X	Full-time teacher
4	Ing. Juan Bellot M.	- Soils and soil conservation		X	Services – Faculty of Agriculture
5	Ing. Bernard Dingler	- Forest ecology - Meteorology and climatology	X	X	Full-time teacher
6	Ing. Percy Montecinos O.	- Forest machinery - Forest harvesting - Forest measurement	X	X X	Full-time teacher
7	Ing. Manuerl Morales U.	- Silviculture I	X		Part-time teacher
8	Ing. Remy Rojas A.	- Technical writing - Forest policy and legislation - Introduction to computers - Rural sociology - Forest extension	X X X	X X	Full-time teacher
9	Ing. Ruth Rodriguez C.	- Botany I - Botany II - Zoology - Dendrology	X X	X X	Full-time teacher
10	Ing. Edward Sanzetenea	- Silviculture II - Tropical forest management	X	X	Full-time teacher
11	Ing. María State V.	- Chemistry	X		Services – Faculty of Agriculture
12	Ing. Julio Vargas M.	- Wood technology - Forest economics - Timber industries - Agro-forestry	X X X	X	Part-time teacher
13	Ing. Gerardo Veizaga V.	- Basic calculus - Technical drawing	X X		Services – Faculty of Agriculture

ORGANIZATIONAL CHART OF ETSFOR (ESCUELA TECNICA SUPERIOR FORESTAL)



UNIVERSITY OF SAN SIMON
FACULTY OF AGRICULTURAL AND LIVESTOCK SCIENCE
ADVANCED FORESTRY STUDIES TECHNICAL COLLEGE (ETSFOR)

Address: Av. Atahualpa (final) Temporal Cala Cala
P.O. Box 447. Telephone: 46956
Cochabamba - Bolivia

**AGREEMENTS WITH NATIONAL
AND FOREIGN UNIVERSITIES**

- DEL MAULE Catholic University - School of Forestry Execution Engineering - CHILE
- Austral University - Faculty of Forestry Science - CHILE
- Nuevo León Autonomous University - MEXICO
- Mikkeli Polytechnic - Pieksamaki Forestry Institute - FINLAND
- Pinar del Río University - CUBA
- Technological Institute - Forest Engineering Dept. - COSTA RICA
- National Universities

**AGREEMENTS WITH DEPARTMENTAL, INTERDEPARTMENTAL,
AND FOREIGN INSTITUTIONS**

- CORDECO-COTESU-PROMIC (Interinstitutional Agreement within the Integral Catchment Area Management Program)
- CASDEC (Centre of Social Action for Community Development)
- CIAT/BTAM (Tropical Agriculture research Centre/British Tropical Agriculture Mission)
- PATAG (Community Livestock and Agriculture Technical Assistance Project)
- CERES/FTPP (Centre of Studies on the Social and Economic Situation, as a leading institution in the Forests, Trees and People Program)
- AIFOR ANDINA (Andean Interinstitutional Forestry Association)
- PROSANA (Nutritional Food Security in the Arque Province Project)
- CDF/CORDEP-DAI (Forest Development Centre)
- PAFKUM (Kunan Mink'a Forestry and Agricultural Project)
- SEGMA (General Secretariat for the Environment)
- FUNDFORMA (Forestry and Environmental Education Development Foundation)
- CIM (International Migration Centre - International Experts Program)
- PROFOR (Reforestation Program)
- CHIMANES - CIRDEBENI PROJECT (Beni's Development Research Centre)
- CUEMAD (Ecology, Environment and Development University Centre)
- FUNDECO (Ecology Development Foundation).

ANNEX 4

FINANCIAL SUSTAINABILITY OF THE PROGRAM

**SPECIALIZATION PROGRAM FOR FOREST TECHNICIANS
ON SUSTAINABLE TROPICAL FOREST MANAGEMENT IN BOLIVIA**

PROPOSAL FOR THE FINANCIAL SUSTAINABILITY OF THE PROGRAM

Items 3.8 and 8.2 of the Project Document describe a number of guidelines for the future financing of the program, considering risks, operation and funding.

On the basis of the budget proposed for the first stage of the project, the required budget has been estimated for years 4 to 6 (i.e. 3 additional years) as follows:

**PROJECT BUDGET BY COMPONENT
FOR YEARS 4 – 6**

Item	DESCRIPTION	US\$
10	PROJECT PERSONNEL	
11	National Experts (ETSFOR teachers)	55500
16	International Experts	15000
12	Administrative Personnel	50000
19	Component Total	120500
20	SUB-CONTRACTS	
24	Sub-contract – Internet services	2400
29	Component Total	2400
30	DUTY TRAVEL	
31	DSA	38000
32	Transport costs	5000
39	Component Total	43000
50	CONSUMABLE ITEMS	
54	Office supplies	5000
54	Spares	2000
53	Fuel, lubricants	10000
59	Component Total	17000
60	MISCELLANEOUS	
61	Sundry	3000
69	Component Total	3000
70	ADMINISTRATION	
71	Administrative costs	3000
79	Component Total	6000
99	GRAND TOTAL (in US\$)	191900

This budget does not take into account certain costs envisaged by ITTO and ETSFOR, for the following reasons:

The National Experts, at an estimated cost of US\$200,000, would be replaced by trained professionals whose salaries would be covered by the University as part of the faculty of ETSFOR with an additional remuneration over a period of 3 years for the extra time to be allocated to the specialization program.

With regard to International Experts, a total of US\$15000 is estimated for specific guidance and assistance to be provided to the program.

Item 50, "Consumable items", does not include satellite images.

Thus, the total cost for the specialization program over a period of 3 years after the completion of the project agreement period is US\$191,900.

Based on the estimated budget, a tuition fee of US\$1,300 per year has been considered for 30 trainees. During the 3 years of ITTO support, these funds will be deposited in a trust fund as follows:

**INCOME FROM TUITION FEES TO BE ALLOCATED TO THE TRUST FUND
OVER A PERIOD OF 6 YEARS**

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
INCOME						
Tuition fees - 30 trainees	39000	39000	39000	39000	39000	39000
Interest earned on capital (12% per annum)	4680	4680	4680	4680	4680	4680
Capital + interest (US\$)	43680	92601.6	147394	208761	277492	354471

PROGRAM COST IF NO FUNDING IS SECURED FOR 3 ADDITIONAL YEARS

Item				Year 4	Year 5	Year 6	Year 7
Yearly cost of course				63966.7	63966.7	63966.7	
Trust funds less costs				83427.1			
Trust funds less costs					73151.7		
Trust funds less costs						61643.3	
Initial capital for year 7							112720.4

The first table shows a total of US\$354471 in capital + accumulated interest, which would guarantee the sustainability of the specialization program as from Year 7 onwards. This situation is considered if funding for the extension of the program for an additional 3-year period is secured, at a lower cost than the first stage of the program.

The second table refers to the continuity of the specialization program as from Year 4, taking into account the capital plus accumulated interest up to Year 3 (US\$147394) and considering a program cost of US\$63967 per year. Based on these estimates, a start-up total of US\$112720.4 will be available as initial capital for Year 7, which is equivalent to about 57% of the estimated cost for years 4 to 6.

It should be pointed out that during the specialization course, work will be carried out on request for private and public institutions, such as the formulation of forest management plans, as well as the provision of other services related to the specialization program as stated in the project document. The income derived from these activities could be used to cover some of the project costs.

With regard to the tuition fee of US\$1300 for specialization program students, it will be possible to obtain fellowships from forest companies, the Forestry Commission (Superintendencia Forestal), the Prefectures, the Municipalities, non-governmental agencies, and other institutions such as the National Environmental Fund and international organizations.