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PROGRAMMATIC ENVIRONMENTAL EVALUATION FOR THE COUNTERNARCOTICS SUSTAINABLE DEVELOPMENT PROJECT

(No. 527-0348)

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ACRONYMS AND ABBREVIATIONS

APODESA	Apoyo a la Política de Desarrollo de la Selva Alta
CATIE	Centro Agrícola Tropical de Investigación y Enseñanza
CEU	Central Evironmental Unit
CIDAH	Centro de Investigaciones y Desarrollo del Alto Huallaga
CICIU	Centro de Investigación y Crianza de Insectos Utiles
CIED	Centro de Investigación, Educación y Desarrollo
CIP	Centro Internacional de la Papa
CSDP	Counternarcotics Sustainable Development Project
EA	Environmental Assessment
EAP	Escuela Agrícola Panamericana
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
FAA	Federal Assistance Act
FAO	Food and Drug Organization of the United Nations
FONCODES	Fondo de Cooperación para el Desarrollo Social
FUNDEAGRO	Fundación para el Desarrollo del Agro
IEE	Initial Environmental Examination
INIA	Instituto Nacional de Investigación Agraria
INADE	Instituto Nacional de Desarrollo
INRENA	Instituto Nacional de Recursos Naturales
IPM	Integrated Pest Management
LOP	Life of Project
NEPA	National Environmental Policy Act
NGO	Non-Governmental Organization
ONERM	Oficina Nacional de Evaluación de Recursos Naturales
PAHO	PanAmerican Health Organization
PEE	Programmatic Environmental Evaluation
PRONOMACH	Programa Nacional de Manejo de Cuencas Hidrográficas
RUP	Restricted Use Pesticide
SPEU	Special Project Environmental Unit
SENASA	Servicio Nacional de Sanidad Agraria
SER	Selva Economic Recovery
UHAD	Upper Huallaga Area Development
UNA	Universidad Nacional Agraria
UNAS	Universidad Nacional Agraria de La Selva
UNICEF	United Nations Children's Fund
USAID	U.S. Agency for International Development
WHO	World Health Organization

1.0 EXECUTIVE SUMMARY

A Programmatic Environmental Evaluation (PEE) was conducted for the proposed Counternarcotics Sustainable Development (CSD) Project in accordance with USAID Environmental Procedures, 22 CFR 216, and the requirements outlined in the CSD Project PEE Scope of Work.

The CSD Project goal is to promote sustainable development in coca producing and adjacent economically depressed areas through the promotion of economic growth and replacement of coca based employment and production activities with licit alternatives. The Project purpose is to increase and diversify income producing opportunities for residents of selected areas, who are dependent on coca production and processing as their main source of income.

As determined at the IEE stage and stated in the PEE SOW, some proposed project activities will have the potential to cause adverse environmental impacts. These include: road and bridge rehabilitation and maintenance, improvement and extension of irrigation systems, small-scale infrastructure rehabilitation and repair, agricultural and livestock production, the introduction of exotic species, and reforestation activities. The purpose of this PEE is to assess potential environmental impacts of the proposed CSD Project and develop environmental standards, guidelines, and mitigation measures for those project activities which may have an adverse environmental impact. The PEE was conducted over a seven week period by a team of five specialists with combined expertise in tropical ecology, environmental engineering, rural sociology, natural resources management, land use policy and planning, road and infrastructure rehabilitation, pest/pesticide management, forestry, and biodiversity assessment. PEE findings and recommendations are summarized as follows.

Potential direct environmental impacts of road and bridge rehabilitation, maintenance, and repair activities include erosion, sedimentation of streams and waterways, blockage or modification of stream flows, and water quality. Potential long term social and environmental indirect impacts are related to increased colonization, which in turn may lead to increased unsustainable wood extraction, forest conversion, watershed degradation, and removal of wildlife. Mitigative actions for infrastructure rehabilitation and maintenance include effective drainage systems, vegetation cover alongside roads, and hillside stabilization. In addition, support for project activities that involve major road or bridge rehabilitation, repair, or maintenance should include environmental awareness programs, as well as assistance aimed at providing local inhabitants with alternative income-generating activities which minimize forest degradation.

Potential impacts of alternative agriculture activities include intensification of pest problems, increased agrochemical use and pesticide-related environmental and health problems, soil compaction and erosion, loss of soil fertility, and expansion of

crop land at the expense of forest cover. To help mitigate potential adverse impacts in this area, the Project should encourage and support the adoption of environmentally-sound agronomic practices such as soil conservation practices, organic composting and mulching, and agroforestry. Hillside agriculture should not be supported on slopes exceeding 30% inclination, unless appropriate soil protection safeguards are implemented. Because the regulation of pesticide use is very limited in Perú, the Project should provide technical assistance in IPM to beneficiary farmers and avoid supporting the use of restricted or cancelled pesticides. Pesticide storage, management, and training guidelines are provided.

The main environmental concern of increased livestock production in project sites that support primary and secondary growth tropical forests entails the destruction of forest cover and associated vegetation and their replacement with pastures. A closely related concern involves the impact on the wildlife which inhabits such forests. Mitigative measures include ensuring that implementation areas found to be suitable for livestock production retain some forest cover, including plant species with foliage and fruit suitable for cattle consumption. This approach would increase the sustainability of livestock production, while conserving a portion of the forest cover. The energy expenditure trade-offs inherent to cattle production in relation to other potential food species, such as domestic pigs, cuy, and poultry should also be considered.

Main environmental concerns associated with Project reforestation and forest management activities include the suitability of tree species selected for reforestation programs and the appropriateness of forest management approaches. Proposed reforestation activities should be carefully evaluated with regard to tree species suitability and composition and reforestation approaches. There are several ongoing reforestation programs in the Project implementation area, which should be tapped for information and expertise. If correctly implemented, this activity should help to bring back land productivity, halt soil erosion, protect threatened watersheds, and restore some of the lost habitat for many animal and plant species. Reforestation may also include agroforestry techniques. The Project should ensure that wood and nonwood products are selectively harvested in a sustainable manner, through the adoption of silvicultural practices that ensure that the forest retains its ecological integrity.

The following general recommendations should be observed during implementation of CSD Project activities:

- No rehabilitation, repair, or maintenance of roads; bridges; schools, health centers and other public buildings; potable water and sanitation systems; latrines; irrigation canals, or any other kinds of construction should be approved without the previous approval from the Project environmental units.

- The project should not support any commercial timber extraction in primary forests or secondary forests in an advance growth stage, or hunting, trapping or

any other form of wildlife harvesting without prior approval from AID/Washington.

- The project should not finance the procurement of pesticides without formal approval from AID/Washington. Requests for pesticide procurement/use should be requested as amendments to this PEE.

- Review of progress in the implementation of recommended environmental mitigative actions should become part of scheduled Project evaluations.

Main PEE recommendations associated with the operational aspects of Project environmental review process include:

- An INADE staff member, in collaboration with the Mission Environmental Officer, will have overall responsibility for ensuring that the mitigative actions and environmental guidelines recommended in this PEE are implemented in a timely manner.

- Two environmental specialists, with combined expertise in brown and green environmental issues, should be recruited to oversee the early stages of implementation of Project environmental component activities and its environmental review and monitoring process. In collaboration with INADE and Special Project counterpart staff, these individuals will be responsible for screening activity proposals, and assisting with all aspects of environmental review and monitoring activities supported under the CSD Project for compliance with environmental guidelines, and implement the Project's environmental component. These individuals will constitute the Project Central Environmental Unit (CEU) during the first three years of Project Implementation.

- During the first year of Project implementation, INADE should assign two technical staff the task of collaborating with the CEU in all aspects of CSD Project environmental activities and procedures. These individuals will, in effect, receive on the job training in CEU operations and share the CEU assigned tasks and responsibilities as soon as their preparation allows it. At the end of the third year of Project implementation, these individuals will assume full responsibility for implementing the Project environmental component and review procedures.

- During the first year of Project implementation, each participating Special Project should establish an environmental unit (SPEU) designed to meet Project needs and complement CEU and INADE responsibilities in the implementation of environmental activities and review process. These units may be fashioned after the existing Central Huallaga and Bajo Mayo Special Project environmental

unit. Each such unit should be staffed by at least two individuals with background in environmental and natural resources management.

- The environmental impact assessment capabilities of participating organizations, such as NGOs, municipalities, and other interested groups, will be strengthened through training and technical assistance programs and through direct participation in the Project environmental review process. It is recommended that the Project should assign the responsibility of preparing and producing required EIAs to participating organizations.

- The CEU and SPEU will review proposed activities for environmental suitability and require the incorporation of appropriate mitigative actions, as needed. Details on the proposed environmental review operational procedures and relationships are provided in section 10.0 of this PEE.

- Environmental review guidelines and checklists are provided in Appendix I to guide and facilitate this process. Recommendations and mitigative actions addressing specific Project activities are summarized under each section covering the respective activities. These recommendations should be regularly consulted by the CEU and SPEU, along with the environmental guidelines and checklists provided in Appendix I.

2.0 PURPOSE

The goal of the CSD Project is to promote sustainable development in coca growing areas and in adjacent economically depressed departments through the promotion of economic growth and replacement of coca based employment and production activities with licit alternatives. The purpose of the CSD Project is to increase and diversify the number of viable income producing opportunities for residents of selected areas, who are dependent on illicit coca production and processing as their main source of income.

The U.S. Foreign Assistance Act (FAA) requires that environmental concerns are integrated into the USAID decision making process. The purpose of USAID's environmental review process is, therefore, to assess the environmental consequences of its actions and to implement the requirements of the National Environmental Policy Act (NEPA) as they apply to USAID's development programs overseas. USAID Environmental Procedures, 22 CFR 216, require that the potential environmental impacts of its proposed projects are identified before such projects are implemented and that appropriate environmental safeguards are adopted to prevent or minimize such impacts.

The purpose of this Programmatic Environmental Evaluation (PEE) is to assess potential environmental impacts of the proposed CSD Project and develop environmental standards, guidelines, and mitigation measures for those project activities which may have an adverse environmental impact. Examples of activities in this category include: construction or improvement of roads and bridges; construction of small buildings, irrigation systems, potable water and sanitation systems; reforestation; and agricultural enterprises. Prior environmental reviews conducted for the UHAD Project and the proposed Selva-Coastal Road Rehabilitation Project, have contributed significant information as to the basic geology, topology, demography, forest cover, land use capacity, soil types, and general ecology of this region. This PEE has relied, in part, on information generated by these previous assessments. This PEE was prepared in accordance with the requirements and guidelines provided by USAID Environmental Procedures (22 CFR 216) and the CSD Project PEE Scope of Work (Appendix II).

3.0 BACKGROUND

USAID projects, especially the Upper Huallaga Area Development (UHAD) Project, have been implemented in the Huallaga Valley and adjoining areas for over a decade. The five year CSD Project, which resembles the SER Project proposed in 1992, will be implemented in selected sites in the Ayacucho, Apurimac, San Martin, Ucayali, Huanuco, Pasco, Junin, Amazonas, Loreto, Cuzco, and Huancavelica departments. The CSD Project will consist of three components: (1) Employment and Income Generation, designed to help free people from dependency on illicit coca

farming by supporting selected agricultural production and agribusiness ventures, including activities that can produce short-term results, as well as activities such as research on alternative crops and promotion of large-scale enterprises designed to produce long-term returns. Examples of short-term ventures that may be supported include paddy rice, corn, livestock, and dairy production. Project support for agricultural production will include adaptive research and extension in corn, livestock, diary, livestock fodder, paddy rice, high-value cash crops (pineapple, medicinal plants, lemon grass, pepper), and soil, water, and pasture management, all of which will be market-driven. (2) Essential Services and Participatory Community Development, which will finance socio-economic community development activities, mainly related to health, education, water and sanitation, small irrigation systems, community organization and training, environmental protection, and emergency activities such as bridge repair after flooding. (3) Environmental Protection and Awareness, to include technical assistance and training on environmentally-sound cultivation practices, soil and water management, agricultural sustainability, reforestation, and related environmental management practices. This component will also finance reforestation of areas damaged by coca production and processing.

The Project will be implemented by the Instituto Nacional de Desarrollo (INADE), through its Special Projects, in at least five zones: The Huallaga Central Special Project in the Ponaza-Sisa-Biabo zone, the Alto Huallaga SP in the Tocache-Uchiza and Tingo Maria-Aguaytia zones, the Pichis-Palcazu SP in the Pichis-Pachitea zone, and the Sierra Centro-Sur zone in the Apurimac River zone. An AID-INADE monitoring and coordination unit will be established to oversee project implementation. In each zone, the project will be implemented directly by the special projects or through various NGOs. Main project activities will include: road construction, rehabilitation, and maintenance, land titling, credit, research, small agroindustries, community development, and environmental management and awareness. Activities supported in each zone will depend on local needs and the local Special Project and NGO capabilities.

4.0 ALTERNATIVES

The unsustainable illicit coca industry in the Project area has caused indiscriminate deforestation, widespread environmental contamination with chemicals routinely used in coca production and processing, and serious social problems that so far have defied short-term solutions. It is widely accepted that without suitable income-generation alternatives, it will be highly unlikely that coca farmers will voluntarily cease to grow this crop. The CSD Project will support a wide range of activities precisely designed to provide economic alternatives to the coca- base industry. A no action alternative would be inappropriate since in the absence of development projects such as the CSDP the affected region would not severe its coca dependency and the associated environmental degradation process would continue unabated.

As designed, the Project will support the implementation of various development activities according to local suitability, needs, and capabilities. This approach allows for a great deal of flexibility in its implementation plan. The Project will also build upon the experience acquired during the implementation of the former UHAD Project and, like its predecessor, it will be implemented by INADE and its Special Projects. This arrangement will guarantee the involvement of experienced public sector institutions in dealing with this challenging and sensitive task, which would rule out the selection on an NGO as the major implementor. Although the CSD Project will support activities that may cause potential adverse environmental impacts, the timely adoption of the mitigative actions recommended in this PEE will ensure that such impacts are prevented or minimized. This PEE therefore finds that, with the adoption of the mitigative actions recommended in this document, the Project as designed is the preferred alternative.

5.0 AFFECTED ENVIRONMENT

5.1 Affected Area

The project area encompasses a vast portion of the Peruvian Selva which has not been precisely defined yet, which will include the yunga or high selva and the Amazonian tropical rain forest (Fig. 1). The Yunga biome is found on the eastern slopes of the Andes, at elevations between 500-600 to 3,500-3,800 m. Its topography consists of steep, high and low mountains, transversed by deep canyons and valleys, which widen in its lower elevations. In its higher regions temperature averages 8-12°C, and 18-25°C in the lower regions. Average annual precipitation ranges from 900 mm in its dryer parts to 4,000 mm in the cloud forests. The tropical rain forest biome is found at an elevation of 100-600 m, where temperatures average 24-29°C and precipitation ranges from 1,200 to 2,500 mm.

In their natural state both biomes support dense tropical forest cover. However, during the past several decades these forests have experienced severe environmental degradation, especially deforestation, which to date is estimated at 8.5 million hectares. Annual deforestation rates are estimated at 250,000-300,000 ha. The rate of deforestation began to increase during the second half of the 1960s, triggered by the construction of the selva marginal road, and has continued to escalate during the past two decades. Severely deforested regions are found in Oxapampa, Villa Rica, Satipo, Huallaga valley, Alto and Bajo Mayo; the regions in the vicinity of the Chanchamayo, Pichis, and Palcazu rivers; the Urubamba valley downstream from Quillabamba, and the areas alongside the Federico Basadre road near Pucallpa, the High Ucayali, and the Tambo river (Table 1). Large tracts of primary and secondary forests are still found in areas such as: Von Humboldt, Biabo, Iparia, Pichis valley, Palcazu valley, Pozuzu, Alto Mayo, and Satipo.

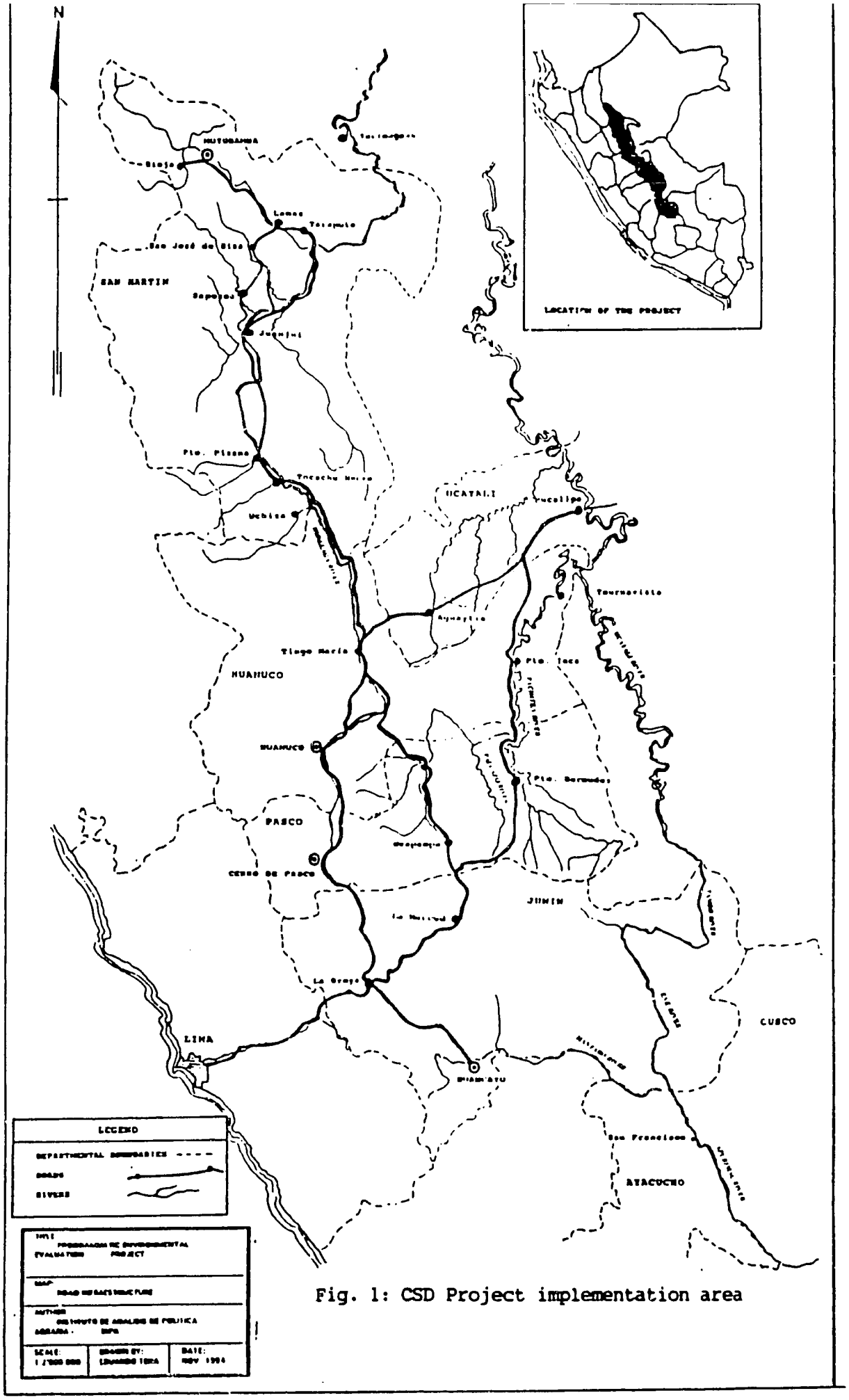


Fig. 1: CSD Project implementation area

Table 1. Areas partially or severely deforested in the project implementation area	
Region	Hectares
Alto Huallaga	670,000
Huallaga Central y Bajo Mayo	500,000
Alto Mayo	160,000
Pichis-Palcazu-Pozuzo	240,000
Aguaytia-San Alejandro-Pucallpa	280,000
Alto Ucayali	69,000
Pachitea	297,000
Total	2,216,000

5.2 Migration and Urbanization

One of the main trends affecting the current geographic distribution of the Peruvian population is the accelerated movement of Andean inhabitants to the High Selva, which in intensity is second only to their concentration on coastal cities. This accelerated rate of migration is a key factor affecting the utilization of natural resources and the environmental degradation in the Project area. The Madre de Dios, Ucayali, and San Martin departments experienced the highest relative growth rates during the period comprised between the 1981 and 1993 censuses. The Madre de Dios population increased by 95.3% (5.7% annual growth rate), that of Ucayali by 88.6% (5.7% annually), and San Martin by 45% (4.5% annually). These regions continue to attract migrants.

Most heads of household (65%) in the Project area come from other regions (Huanuco, Ancash, La Libertad, Lambayeque, Cajamarca). Originally, their migration to the Huallaga region was stimulated by the Peruvian government during the first half of this century. After 1960, migration continued spontaneously, colonizers growing legal crops (coffee, cacao, rice, and various fruits). Later migrants have arrived attracted by the illicit coca production and trade. Approximately 42,000 people arrived in the Huallaga Valley between 1972 and 1981. In 1940, the Upper Huallaga region population was approximately 11,600. In 1981 it had increased to 134,000, and at present it is exceeds 250,000.

5.3 Agriculture

The current environmental deterioration linked to coca production is affecting the upper selva as a whole. This form of ecological degradation is the result of a particular type of economical development, which in the case of coca production requires a reorientation. The latter involves the search for economically and ecologically sound alternatives.

A sizeable portion of colonized land in the upper selva is devoted to agriculture and livestock production. It is difficult to estimate accurately the dimensions of the area involved, as each year large tracts of cultivated land are abandoned, while new forest land is cleared for cultivation. Main traditional crops grown in the Project area include: upland rice, corn, yuca, beans, bananas and various tropical fruits. The technological level of traditional crop farming is very low, which translates into low yields, most of which is for the farmers' own consumption. Crops grown for trade and marketing purposes include cacao, peppers, coffee, and lemon grass.

Current agriculture and livestock management policies and practices lead to poor yields. Official policies which require that farmers show proof of improvements in their farms to access government credit have led to increased slash and burn practices. Deforestation intensifies the soil erosion process, and farmers abandon cleared land as soon as yields drop due to the rapid loss of soil fertility. Low productivity is also a consequence of inadequate farming technologies, unsuitable to local ecological conditions. Appropriate technologies, such as agroforestry and adequate cropping systems, are not implemented mainly due to the lack of a functional extension system. For instance, when coffee is grown under an agroforestry system, yields can be 10 times greater than when grown under traditional systems.

Deforestation often follows colonization. New, mainly Andean colonizers, are used to clean cultivation and consider forest clearing essential for agriculture. This practice is not compatible with local policies that promote extensive crop and livestock production. In the past, agricultural development projects implemented in the upper selva with international funds have emphasized increased agricultural production with little or no environmental concern.

As a result of land clearing activities primary forests are lost, soils are eroded, the soil fertility diminished, wildlife habitats are destroyed, and watersheds are affected.

5.3.1 Production Systems

In the valley floor, the topography is flat and slightly inclined and includes low and high terraces which are subject to periodic flooding. The silt and clay thus deposited help to build up the soil. The high terraces, with their deep, fertile soil are better suited for intensive agriculture. An irrigation infrastructure for use during the

dry season is usually found in valley floors. Agriculture at valley floor is intensive and technified, relying heavily on fertilizer and pesticide use and mechanized farm equipment. Main crops grown are rice, soybeans, and beans. Rice, the major crop, is frequently grown as a monoculture and under flooded conditions, being harvested twice a year. There is a well developed irrigation infrastructure. In areas where rice is not the dominant crop, cattle ranching is the main activity. Most pastures are often degraded due to overgrazing (e.g. Biabo) or abandoned. Degraded pastures consist of both native vegetation and introduced pastures which could not adapt to the low nutrient and high aluminum content of soils characteristic of tropical areas. Pasture degradation is followed by soil degradation due to compaction, low infiltration rate, and mechanical damage caused by the movement of cattle.

The base of the foothills consist of undulating landscapes, with moderately inclined areas and soils of colluvial origin and moderate to good fertility levels. The mean annual temperature is lower and precipitation higher than on the valley floor. There is a limited irrigation infrastructure in this zone. At the base of the foothills, crops are grown under a haphazard system of field rotation, as opposed to crop rotation. Crops are mainly rain-fed and irrigation infrequent. Farming activities continue until the soil loses its fertility and a severe yield reduction signals a shift to another newly cleared field. In this zone, corn is the main food crop and cotton the main cash crop. Other crops grown include peanuts, sorghum, soybeans, and tropical fruits such as bananas, papayas and pineapples. The use of agrochemicals is low, and the poorer farmers often use animal manure and kitchen leftovers as a fertilizer. This zone also includes large tracts of primary forests, which provide farmers with firewood. Farmers often raise cattle, horses and poultry, mainly for his/her own consumption, selling any surplus in the local market.

The foothills exhibit steep slopes, shallow soils and low fertility levels. Agriculture in the foothills is characterized by shifting cultivation and a crop mix designed to overcome climatic risks. The most common system is the intercropping of bananas, yuca, beans, and peanuts, all grown for home consumption. Corn, cotton and other crops are grown for the local market. Farmers practice subsistence agriculture, and do not apply agrochemicals. The slash and burn practice is widely used because of low soil productivity. Crop rotation is not practiced. In this zone deforestation is severe, especially where coca is grown.

The mountains are characterized by steep slopes covered by rain forests, shallow soils which are unsuitable for agriculture, low fertility, and sometimes rocky outcrops, where well hidden coca fields can be found wherever topography allows it. This is a region of high precipitation and cool temperatures.

5.3.2 Pesticide Regulation and Management

The Agriculture Ministry's Servicio Nacional de Sanidad Agraria (SENASA) is the official agency responsible for registering pesticides in Perú. In 1992, SENASA replaced the Dirección de Sanidad Agrícola and was granted greater autonomy and financial control than DSA. Related SENASA functions include the regulation of animal and plant health and quarantine. SENASA's 1993 publication "Plaguicidas Agrícolas y Sustancias Afines Registradas en El Ministerio de Agricultura" outlines the registration requirements for crop protection chemicals marketed in Peru and lists the seven cancelled products to date, mainly organochlorines (Appendix IV). There are at present about 40 major agrochemical firms operating in Perú.

Although Peruvian law requires that all pesticides marketed in the country be registered by SENASA, this agency does not really have the manpower to monitor compliance at the pesticide retail store level. SENASA does not regulate, either, the sale, procurement, or use of pesticides. In Perú, there are no restrictions as to who can buy or apply pesticides, regardless of toxicity. Authority to issue permits for operating pesticide retail stores resides at the municipal government level.

SENASA has well-defined requisites for the content and form of pesticide labels. These must be in Spanish and include the following information: technical name, chemical composition, general precautions, toxicity, first aid, antidote, application instructions, last application - harvest interval, and a general tolerance (which is inappropriate, as tolerances must be crop-specific). Pesticide toxicity and risk levels are assigned different color codes, symbols, and warning words in labels: red, skull and cross bones, and the word "veneno" (poison) for extremely toxic products; yellow, skull bones, and the work "veneno" for highly toxic products; blue and the word "precaución" (caution) for moderately toxic products; and green and the word "precaución" for lightly toxic products. This classification system is somewhat similar to that established by EPA in the U.S. However, in Perú there is no equivalent of EPA's Restricted Use Products (RUPs), which in the U.S. may only be purchased or used by a certified pest control operator or under his/her supervision. The Peruvian and EPA pesticide toxicity classification systems are shown in Tables 2 and 3.

There seems to be little information as to the extent of pesticide intoxications and related health problems. According to the SENASA Dirección de Defensa Agrícola director, registries of pesticide intoxications are not kept at the national level. It would probably require a systematic search of individual hospital records to come up with baseline data on pesticide intoxications in the major agricultural regions of the country.

The integrated pest management (IPM) approach to pest control is the officially accepted crop protection philosophy in Peru. Indeed, one of the earliest known documented cases ever of successful implementation of IPM to rescue a crop (cotton) which had reached the crisis stage because of pesticide overuse is that of the Cañete

valley in the 1950s. At present, the government is also promoting the adoption of biological control approaches through the introduction of insectaries and techniques for rearing natural enemies of insect pests. There are so far about 25 such insectaries, all of which are expected to become private enterprises, and located along coastal valleys. There are no plans at present to expand this program to the Amazonian regions.

Table 2. SENASA Pesticide Toxicity Categories

Pesticide Class	Oral Toxicity (LD_{50})		Dermal Toxicity (LD_{50})	
	Solids	Liquids	Solids	Liquids
I. Extremely Toxic	5 mg/kg or less	20 mg/kg or less	10 mg/kg or less	40 mg/kg or less
II. Highly Toxic	5-50 mg/kg	20-200 mg/kg	10-100 mg/kg	40-400 mg/kg
III. Moderately Toxic	50-500 mg/kg	200-2000 mg/kg	100-1000 mg/kg	400-4000 mg/kg
IV. Lightly Toxic	Over 500 mg/kg	Over 2000 mg/kg	Over 1000 mg/kg	Over 4000 mg/kg

Table 3. EPA Pesticide Toxicity Categories

Hazard indicator	Class I: Danger	Class II: Warning	Class III: Caution	Class IV: Caution
Oral LD_{50}	50 mg/kg or less	50-500 mg/kg	500-5000 mg/kg	Over 5000 mg/kg
Dermal LD_{50}	200 mg/kg or less	200-2000 mg/kg	2000-20000 mg/kg	Over 20000 mg/kg
Inhalation LD_{50}	0.2 mg/l or less	0.2-2 mg/l	2-20 mg/l	Over 20 mg/l
Eye effects	Corrosive: Corneal opacity not reversible within 7 days	Corneal opacity reversible within 7 days; irritation persisting for 7 days	No corneal opacity; irritation reversible within 7 days	No irritation
Skin effects	Corrosive	Severe irritation at 72 hours	Moderate irritation at 72 hours	Mild or slight irritation at 72 hours

5.3.3 Impact of Coca Cultivation

The production and processing of coca, *Erythroxylon coca*, is a major cause of environmental deterioration in the high selva. Official statistics indicate that there are approximately 108,300 ha under coca cultivation in the Huallaga valley alone, although Peruvian sources claim larger areas. The distribution of coca production in this valley, according to APODESA, is shown in Table 4.

Table 4. Distribution of coca production in the Huallaga Valley

Locality	Cultivated Area ha
Upper Huallaga	
Tocache	43,375
Leoncio Prado	24,206
Marañón	9,818
Huamalies	4,123
Total	81,522
Central Huallaga	
Mariscal Cáceres	25,588
Bellavista	11,215
Picota	6,185
Huallaga	10,960
Total	53,948
Río Mayo Watershed	
San Martín	8,957
Lamas	10,802
Moyobamba	2,860
Rioja	2,310
Total	24,749
Total (Huánuco and San Martín)	160,210

As shown in Table 4, there is a proliferation of coca fields in the Tocache locality, where the ratio of coca fields to licit crops is 3:1. In the Mariscal Cáceres province, coca fields are located in the regions of Sión, Campanilla and Pachiza, where the ratio is 2:5. In contrast, in Rioja and Moyobamba there is only 1 ha of coca for each 8.5 ha of licit crops, as farmers there prefer to grow rice and corn.

Coca fields are found mainly on steep, often inaccessible slopes with a 40% degree of inclination or greater. Coca grows best in the higher slopes, between 500 to 1,500 meters above sea level, and in well-drained soils. Coca fields average 0.5 to 1.0 ha, which is also the production of a single farmer.

Through coca production, farmers have been introduced to a monoculture which threatens the survival of the tropical forest. To fully understand why this is so, this crop's management practices must be understood. Coca leaves are harvested every 90 days. This leaves the coca shrub branches naked and the soil beneath unprotected from the impact of raindrops and thus subject to a high rate of erosion. In addition, because the coca plant is subject to fungal attack when grown in poorly drained soil, coca is planted, often on steep hills, in rows aligned with the direction of their slopes. Along with the land clearing, these two factors contribute to accelerate the process of soil erosion in the high selva hillsides.

In addition to deforestation and soil erosion, the process that converts coca leaves into basic paste, the precursor of cocaine, results in severe chemical contamination. To obtain basic paste, coca leaves are mixed with several chemicals and solvents in fermentation pits. After the fermentation process is completed, the chemicals are poured into nearby streams and rivers, polluting these, as well as ponds and other water bodies downstream. It is estimated that the production of 2,800 tons of cocaine basic paste requires 25,000 liters of kerosene, 14,000 of sulfuric acid, 3,000 of acetone, and 3,000 of toluene, all of which end up in the soil and water systems of the region.

5.4 Wildlife

One direct result of deforestation in the project implementation area has been the decrease in the diversity and abundance of wildlife. Indiscriminate hunting and trapping pressures have contributed to wildlife depletion.

In undisturbed high selva region habitats, the biome characteristic fauna is still found, including peccaries, *Tayassu pecari*, *Tayassu tajacu*; deer, *Pudu* sp., *Mazama* sp.; tapir, *Tapirus terrestres*; cats, such as *Pantera* sp. and *Felix* spp.; river otter, *Lutra* sp.; Ronsoco or Capybara, *Hidrochaerus* sp.; spectacled bear, *Trematus ornatus*, and many birds, rodents, reptiles, amphibians, and arthropods.

Fauna in the low selva is highly rich and diverse. Some representive genera include: Primates (*Alounatta, Ateles, Cebus, Lagothix, Saimiri*), other mammals (*Tapirus, Tayassu, Félix, Leo, Mazama, Pudu, Lutra, Dasypus*), birds (*Ara, Amazona, Crax, Tinamus, Anas, Sarkidiornis*), reptiles (*Geochelone, Podocnemis, Caiman, Melanosuchus, Boa, Chelonia*), and many others.

In spite of the selva's rich biodiversity, deforestation and other environmental degradation factors are contributing to its decline in many areas, a situation that

becomes especially serious when the loss of habitat threatens endemic or rare species. At least 333 species of vertebrates are known to be endemic to Perú. These include 46 mammals, 105 birds, 95 reptiles, 87 amphibians, and 50 are fish. The updated official list of endangered, threatened, and rare vertebrate species is included in the Tropical Forest Ecology section, Appendix I.

5.5 Protected Areas

There are three national parks in the project area, which were established to protect locally representative species and ecosystems. These are the Tingo María, Río Abiseo, and Yanachaga-Chermillén National Parks (Fig. 2).

The Tingo María National Park is located quite close to the city of Tingo María, Leoncio Prado province. It was founded in 1965, partially to protect the scenic Bella Durmiente (sleeping beauty) hills and the "owl" natural cavern. In the past, the Park's forests have been the subject of selective industrial wood extraction. Recently, its proximity to rural roads and the expanding urban center of Tingo Maria is contributing to accelerated environmental degradation due to wood extraction and agricultural activities. This 18,000 ha park, which at present harbors over 30 bird, 35 mammal, 5 reptile, and 2 amphibian species, respectively, is being threatened by illicit coca cultivation in its higher parts, and by traditional agriculture in its lower regions.

The Yanachaga-Chemillen National Park, located in the Oxapampa province, department of Pasco, was founded in 1986 and encompasses 122,000 ha. It is situated in one of the main Pleistocene refuges (Pachitea-Ucayali), which is believed to be a major floristic and faunistic evolution center, and includes a wide range of ecosystems, including Andean tundra grasslands, dwarf forests in the western Andean foothills, and lush tropical and subtropical Amazonian rain forests. The Park also includes numerous biotic communities, its fauna exhibits a high level of endemism, and provides habitats for many vertebrates, including some 400 bird, over 60 mammal, 16 reptile, and 31 fish species. Agricultural activities in the Park are limited to 10 ha at present, and there is some extraction of secondary forest products by people who inhabit surrounding areas. The only road which crosses the Park is a 20 km portion of the Oxapampa-Pozuzo road, but it does so along a valley bordered by high and steep hillsides, which discourage colonization.

The Río Abiseo National Park, is located in the Mariscal Cáceres province, San Martín department. It was founded in 1983 and encompasses 274,520 ha of mainly Yunga (high selva) and a small portion of puna regions. It also has been designed to include a Pleistocene refuge and the Huallaga evolutionary center for many plant and animal species. Its principal ecosystems include *Podocarpus* forests, cloud forests, low tropical forests, humid tropical forests, and premontane very humid forests. It is also characterized by a high level of endemism and harbors some endangered mammals such as the yellow tail Choro monkey, *Lagothrix flavicauda*; spectacled bear, *T. ornatus*;

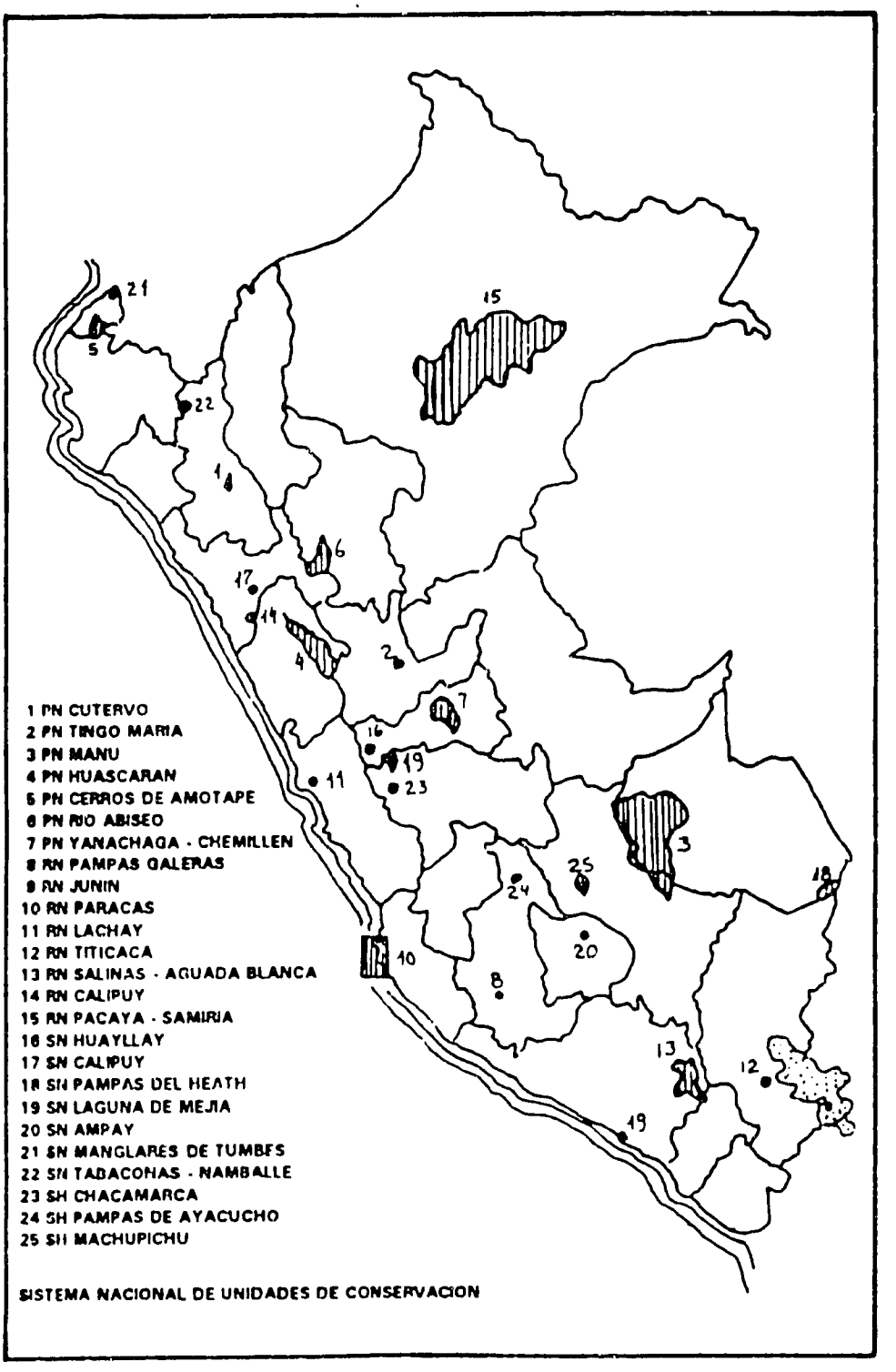


Fig. 2: National Conservation Units System in Peru

deer, *Pudu mephistophiles*, *Hippocamelus otisensis*; tigrillo, *Felis pardalis*; and condor, *Vultus griphus*. Furthermore, the Park's flora includes some 980 plant species, of which 169 are pterophytes (out of some 1,000 fern species believed to exist in the country). It also harbors 175 monocotyledoneous plants, including 12 orchid, 34 grass, and 17 cyperaceous species.

In the Project area there are also two protected forests, established in 1987 to help protect local watersheds and farm lands. These are the 182,000 ha Alto Mayo Protected Forest in the San Martín department, and the 145,818 ha San Matías-San Carlos Protected Forest located in the Pasco mountain range, between the Pichis and Palcazu valleys, Pasco department (Fig. 3).

Finally, there are three national forests in the Project area, which are supposed to be subject to state supervision regarding utilization and management. These are: the Mariscal Cáceres National Forest (137,448 ha), located in the San Martín department, near the Río Abiseo National Park, the Alexander Von Humboldt National Forest (570,800 ha), located between the Ucayali y Huánuco departments, and the Biabo-Cordillera Sur National Forest, in the San Martín department (Fig. 3).

5.6 Economic Uses for Forest Plants

Within a sustainable utilization context, forest uses are usually classified into wood and nonwood products. Wood products uses include; construction, furniture, parquet, plywood, paper pulp, fuelwood, posts, and many others. Main tree species used in sawmills include: tornillo, cedro, caoba, moena, cumala, catahua, roble, copaiba, ishpingo, cedro, huasca, pashaco, alcanfor, tulpay, ulcumano, alfaro, caraña, huayruro, and many others. Main species used for parquet include: quinilla, caoba, chucchumbo, estoragne, tahuari, quina quina, huayruro, capiruni, and pochotoroque. Under the Industrial Utilization of New Forest Species in Perú Project, the reforestation and industrial potential of several tree species were tested, including: aguano masha, shihuahuaco, capirona, and estorane. Main species for playwood are: capinuri, lupuna, and catahua. Species suitable for venier include: caoba, cedro, congona, lagarto caspi, copaiba, diablo fuerte, ishpingo, and nogal. Some species in the project area suitable for railroad rail ties are: manchinga, mashonaste, quina quina, tamamuri, and chimiena. At present there are no pulp plants in the project area, but studies conducted by the Universidad Agraria indicate a high forest potential for pulp production.

Common nonwood forest uses include: food, medicinal and aromatic products, cosmetics, dyes, tannins, fibers, ornamentals, resins and glues. Most of the these products are regulary extracted, in a very small scale, by local inhabitants and with project support may become a sustainable export industry for the local and export markets. Species with potencial for medicinal uses include: *Chinchona oficinalis* (anti-malaria), *Uncaria tomentosa* (anti-infammatory), *Hura crepitaus*, *Physalis angulata*, *Cedrela fissilis*, *Clarisia racemosa*, *Ficus insipida and F. maxima* (used against gastro-

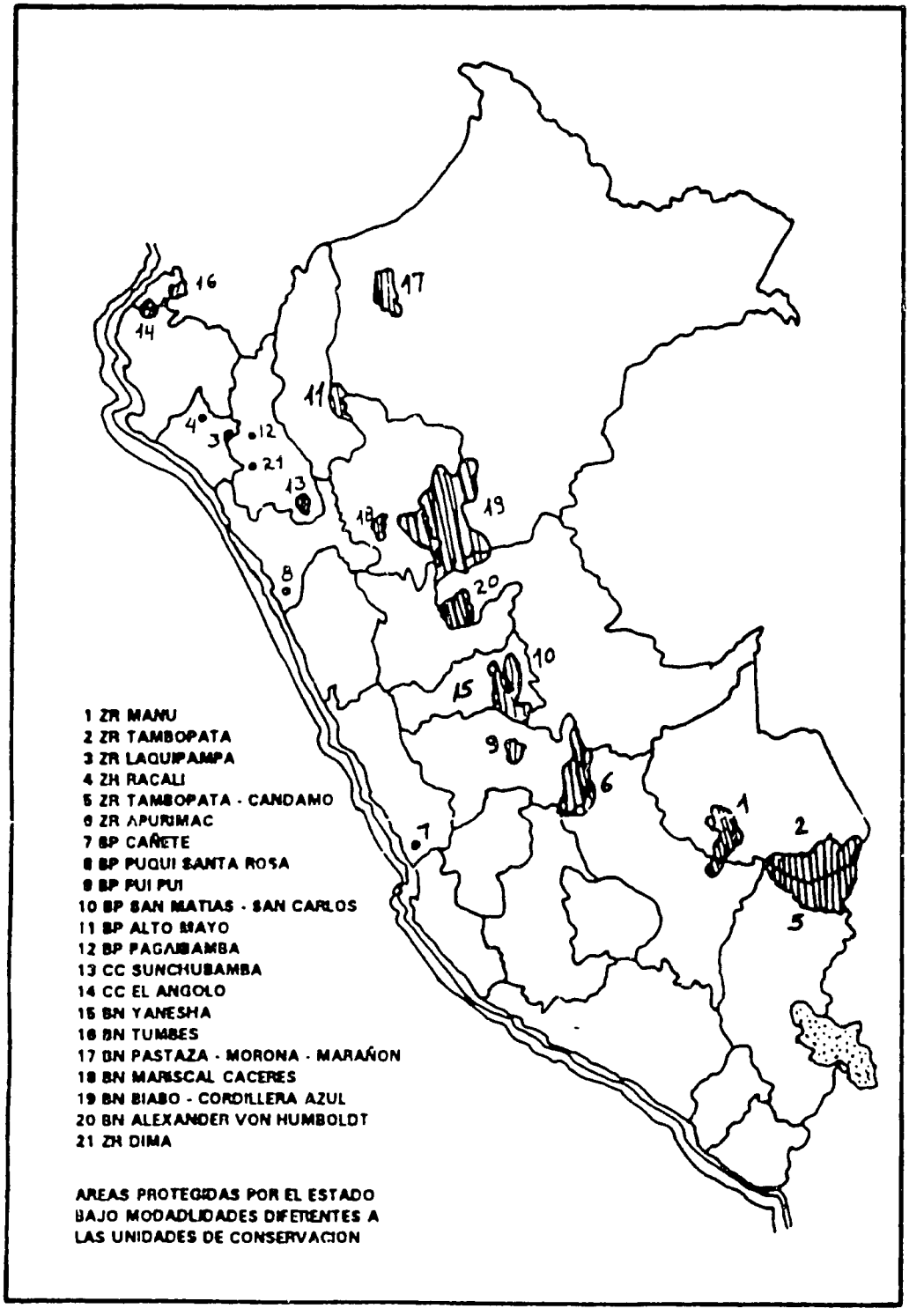


Fig. 3: Protected areas not included in the National Conservation Units System in Peru

intestinal parasites), *Croton lechleri*, *Myroxylon balsamum*, and *Copaifera cicatrizante* (wound-healing agent). Species that can provide fibers include: *Cecropia membranacea*, *C. francisci*, *Cordia alliodora*, *Anona spp*, *Guatteria chlorantha*, *Heliocarpus popayanensis*, *Muntingia calabura*, and *Teobroma cacao*. Potential species in the cosmetics area are: *Bixa orellana*, *Bixa platycarpa*, and *Genipa americana*. There are many forest plant species that produce edible fruits. Examples of these are: *Spondias mombin*, *Genipa americana*, *Couna macrocarpa*, *Juglan neotropica*, *Inga spp*, *Manilkara bidentata*, and palm trees such as: *Jesenia sp.* and *Manritia flexuosa*.

5.7 Surface and Ground Water

The surface water in the Project area consists of a vast network of rivers and streams, including the Huallaga, Ucayali, Pachitea, Tambo, Mayo, and many others. The Huallaga river arises in the high Andes of the Huánuco and Pasco departments, crosses the San Martín department, and empties into the Marañón river in the Loreto department. The Ucayali river arises out of the confluence of the Tambo and Urubamba rivers, near the juncture of the Ucayali and Junín departments. The Ucayali then joins the Marañón river in the Nauta locality, thus giving rise to the Amazon river. The Pachitea river arises when the Pichis and Palcazu rivers join in the Huánuco department, and empties into the Ucayali, near the Hononia locality. The Tambo-Ene-Apurímac river system originates in the Cuzco department, crosses the Apurímac, Ayacucho, Cuzco, and Junín departments. The Urubamba river also originates in the Cuzco highlands, runs almost parallel to the Apurimac river as it crosses the department, and joins the Tambo river in the Atalaya locality.

Smaller, but important river systems, where most of the human activity in the Project area takes place, include the Alto Mayo, Sisa, Saposoa, Biabo, Chontayacu, Abiseo, Huayabamba, and Tocache in the San Martín department; the Aguaytía and Pisqui rivers in the Ucayali department; the Pichis, Palcazu, Oxapampa, Huancabamba, and Pozuzo rivers in the Pasco and Huánuco departments; and the Chanchamayo, Satipo, and Perené rivers in the Junín department.

Most environmental problems affecting the river systems in the Project area are te result of human activities. Thus, widespread deforestation causes soil erosion of unprecedented proportions and the emptying of millions of cubic meters of sediments into the rivers. Studies conducted by ONERN in the central Huallaga area show that a single hectare of a poorly managed maize field will lose about 99 metric tons of soil per year, whereas one hectare of primary forest, under comparable conditions, will lose only 0.87 metric tons of soil per year. The excessive washing of sediments into the river systems can be detrimental to aquatic life.

Urban centers in the Project implementation area generate large volumes of untreated liquid waste which empty into the hydric systems, the contamination effect being particularly severe in the smaller creeks and streams. Similarly, organic and

inorganic industrial waste is released virtually untreated into the river system. In regions which support licit or illicit agricultural activities, pesticide residues transported in rainfall water runoff contribute to river and stream pollution and may contaminate fish consumed by local residents, thus creating a potential health risk.

A particularly severe instance of water contamination is that resulting from illicit coca processing activities. For instance, in 1992 several million liters of kerosene, acetone, sulfuric acid, and toluol, as well as millions of kilograms of potassium carbonate and carbon compounds used to process coca leaf into basic paste were dumped into streams and rivers of the San Martin department. In addition, unlike most other locally-grown crops, coca production relies heavily on fertilizer and pesticide use.

In some regions in the Project area, such as the Yuyapichis river in the Pachitea watershed, there are gold washing and mining activities, which utilize of mercury in the extraction process. Mining activities also remove and process large volummes of sediments: To obtain a single gram of gold, it is necessary to remove over 1 m^3 of rock and sediment. The release of such large volummes of sediment into the river systems, increases turbidity, disrupts the natural water flow, and adversely affects aquatic life.

6.0 ASSESSMENT OF POTENTIAL ENVIRONMENTAL IMPACTS

6.1 Road and Bridge Rehabilitation and Maintenance

Under the CSD Project, there will be assistance for the construction, maintenance, and repair of roads and bridges. Immediate environmental impacts resulting from these activities include erosion, sedimentation of streams and waterways, blockage or modification of stream flows, and water quality. Additional environmental concerns pertain to the use of borrow-pits and the procurement of local materials for road surfacing, such as sand and gravel. Potential long term social and environmental impacts of road and bridge construction and repair in the more remote project implementation areas are related to the resulting increase in colonization, which in turn may lead to increased unsustainable wood extraction, forest conversion, watershed degradation, and removal of wildlife.

6.1.1 Generic Environmental Assessment

The main direct adverse environmental impacts of road construction are those resulting from ground disruption during the construction process and those caused by vehicular traffic once the road is in full operation. In addition, road or bridge construction, upgrading, or maintenance activities are bound to result in increased colonization of forest land by mainly Andean migrants searching for farm land, as well as by local farmers leaving low-productivity areas in search of more fertile land. Because farmers invariably rely on slash and burn practices, this form of colonization leads to the rapid degradation of forest cover. Access roads to agricultural and wood

extraction centers in the high and low selva regions have indeed facilitated the continuing unsustainable exploitation of natural resources in the area.

Road construction also disrupts hillsides and contribute to soil erosion during the rainy season as water in the roads' lateral draining ditches overflows, cutting deeply into often unstable hillsides. Deforestation on hillsides bordering roads help to accentuate the erosion process. Road construction in deforested, hilly areas often triggers erosion and land slides, even when containing walls are built at the hillside base. Often, roadside communities develop near rivers and streams. People activities there often disrupt the natural river bank defenses, resulting in floods and damage to farmlands and the communities themselves. Lack of regular road maintenance, especially the cleaning of the lateral drainage system, cause road deterioration and damage to vehicles, which may in turn lead to the proliferation of roadside repair shops, restaurants, and related business, all of which will contribute to the unregulated disposal of litter alongside the road.

6.1.2 Potential Impacts and Mitigative Measures

Potential adverse impacts	Mitigative measures
• Talus soil erosion due to lack of efficient drainage systems in the presence of unprotected soils due to deforestation. Hillside instability.	• Provide roads with effective drainage systems, including adequate maintenance. Design talus according to the Environmental Manual of the Ministry of Transportation. Maintain a healthy vegetation cover alongside roads. Regulate agriculture and forest utilization on hillsides and near roads. Apply conservation practices developed by the Ministry of Agriculture.
• Erosion risks after road construction ends	• Replace as soon as possible all vegetation cover removed during construction. Plant rapid-growing grasses on soil exposed to runoff.
• Environmental contamination due to improper disposal of materials such as oil, grease, batteries, and tires, as well as trash and human waste in and near construction work camps.	• Set up suitable waste disposal procedures and sanitary fields near work camps. Avoid servicing equipment outside camp grounds. Restore soil removed for gravel extraction operations. Supply camps with suitable potable water distribution systems. Avoid spills of tanks containing fuel and other toxic materials.
• Indirect impacts include facilitating increased migration, colonization, and deforestation for both wood extraction and agricultural purposes.	• Regulate colonization and land use activities. Major road construction activities should include conservation awareness programs and guidance for identifying suitable alternatives to wood extraction and other causes of deforestation.

6.1.3 Capabilities of Implementing Agencies in the Application of Construction Environmental Standards

Several official institutions are involved in road construction and maintenance in the Project implementation area, including INADE's Special Projects, FONCODES, and the Ministry of Transport, Communication, Housing, and Construction (TCVC). In addition, the Army's engineering battalion is engaged in the restoration and maintenance of Federico Basadre and Selva Marginal roads, which are the main roads in the Project area. None of these institutions has environmental assessment or monitoring capabilities. Although the TCVC Ministry requires, in agreement with the current Environment Law, that road construction and upgrading plans include environmental impact studies, in practice this process is not implemented effectively.

6.1.4 Recommendations for Strengthening the Capabilities of Implementing Agencies in the Application of Construction Environmental Standards

Through its environmental monitoring unit the CSD project should establish linkages and information exchange mechanisms with other institutions involved in EIA work of road construction activities. In addition, it should support the understanding and adoption of the Environmental and Natural Resources Code guidelines and promote environmental training for road construction contractors to sensitize them to environmental issues and help prevent environmentally adverse actions linked to road construction activities.

6.2 Small Scale, Community Level Infrastructure Repair and Construction

The CSD Project envisions support for a wide range of small scale infrastructure such as potable water and sanitation systems, schools, classrooms, medical centers, minor irrigation systems, and aquaculture infrastructure. Small scale infrastructure development could have limited adverse impacts on the immediate environment, such as erosion, waste disposal, and sanitation.

6.2.1 Generic Environmental Assessment

The need to establish potable water and sanitation services in rural areas has increased since the 1991 cholera outbreak. This need is particularly acute in urban centers such as Tingo Maria, Aucayacu, Uchiza, and Tocache, where untreated raw sewage is routinely discharged into the river systems.

Main environmental impacts linked to school and medical post construction are those caused by the movement and disposal of equipment and materials involved in the construction process itself and by the operation of the facilities, such as trash accumulation and improper operation of sanitary services.

In the project implementation area, there are over 95,000 ha of land targeted for irrigation, only 12,000 of which already have been outfitted with irrigation infrastructure. For this reason, the demand for small scale irrigation projects in the Project area is high. Main adverse environmental effects of irrigation activities include water overflow and leakages that may produce soil erosion.

Overall adverse impacts of small scale infrastructure activities include: Removal of soil and plant cover at and near construction sites; deforestation in the vicinity of the structures; improper disposal of left-over construction materials; spills and misuse of construction materials such as cement, additives, lime, paint, glues, etc.; improper disposal of oil, fuel, tires, spare parts, and other items needed for the operation and maintenance of construction equipment; and improper disposal of solid and liquid waste originating in construction camps.

6.2.2 Potential Impacts and Mitigative Measures

Potential adverse impacts	Mitigative actions
• Construction site improperly located in agricultural or natural areas	• Site selection for all construction projects should be based on land use studies
• Improper disposal of construction materials and related liquid and solid waste at or near construction sites results in water and soil contamination.	• All construction-generated waste should be taken to suitable sanitary fills. Construction operations should be supervised to prevent spills of materials such as oil, fuel, and cement. No waste disposal should be allowed near streams, rivers, or other water bodies.
• Soil saturation due to improper irrigation procedures	• Regulate water consumption to prevent over-irrigation; install and maintain suitable drainage systems; coat irrigation canals with concrete to prevent water filtration; adopt sprinkling irrigation techniques.
• Soil erosion due to improperly constructed irrigation systems	• Provide irrigation canals with suitable safety margins and drainage systems, establish sound water use plans, based on actual needs; avoid digging irrigation ditches on steep hillsides
• Contamination due to improper sanitation and waste disposal operation in construction camps	• Clean up and restore grounds as much as possible to its former state before breaking up camp

6.2.3 Capabilities of Implementing Agencies in the Application of Small Scale Construction Environmental Standards

There are several public sector institutions engaged in infrastructure construction and upgrading in the Project area. These include INADE and its Special Projects,

FONCODES; local municipalities, provinces, and districts, and the Ministries of Agriculture, Fishing, Public Health, and Education. Their capabilities for implementing GOP's Environmental Code regulations applying to infrastructure construction and maintenance was discussed in section 6.1.3.

6.2.4 Recommendations for Strengthening the Capabilities of Implementing Agencies in the Application of Small Scale Construction Environmental Standards

These recommendation are the same as those outlined in section 6.1.4 of this PEE.

6.3 Recovery of Agriculture: Crop Production

The CSD Project will support production of traditional food crops (rice, cacao, corn, yuca, cotton, beans, bananas) and nontraditional crops (tropical fruits, palm oil, palm hearts, lemon grass, macadamia nuts, spices, medicinal plants), as well as mulberry trees for silk worm cultivation. Most of these activities will take place in valley floors and the lower portions of surrounding foothills.

6.3.1 Generic Environmental Assessment

The fragile ecological equilibrium of tropical agricultural systems can be easily altered through the introduction of unsuitable crops and crop and soil management practices, such as those imported from Andean regions. The introduction of such practices, along with coca production, has resulted in severe environmental damage to the high selva region. The valley floors and surrounding foothills in the Project area, where most of the Project activities will be implemented have been almost totally deforested and converted to agriculture, with forest remnants remaining in isolated areas. Often, trees and shrubs often grow along farm edges. This is also the region's agroecological zone where agrochemical use is most intensive.

6.3.1.1 Traditional Crops

Maize: The Project must consider that in the high selva region farmers often plant maize on steep slopes previously cleared of native vegetation for such purpose. This is precisely what happened in the 1980s, when large extensions of hillside forest were replaced with maize fields, and later with coca fields. Deforestation and soil erosion are thus the main concerns. It is reported that maize grown on a hillside with a slope of 50-70% inclination and a precipitation of 914 mm/year can cause the loss of an average of 100 metric tons/ha/ year of arable topsoil. In the high selva, evidence of the environmental consequences of hillside farming can be readily seen, as coarse material upon the soil surface and rocky outcrops.

Rice is one of the most high-input crops in the Project area. In response to promotion programs, rice farming in the high selva region has increased significantly in recent years. There are several potentials problems associated with rice production. Flooded rice affects the natural soil drainage and the local weed composition. Weeds well adapted to flooding conditions begin to appear and herbicides need to be used with increased frequency. Most of these weeds are grasses which compete effectively with rice. Moreover, there are few herbicides that can selectively kill such weeds without harming rice, both being monocotyledonous plants. The increasing use of nitrogen-containing fertilizers cause nitrate pollution of the water system, leading to the rapid eutrophication of ponds and small lakes. The continuous use of soils under flooded rice farming prevents a complete oxidation of the deeper soil layers, thus soils are reduced leading to the accumulation of toxic compounds which are toxic to other crops. In addition, as rice growing area increases, so does water utilization, which in turn leads to decreased water availability for farmers located downstream. Furthermore, major irrigation systems can be affected by the reduction in water supply, which can also affect the salinity of irrigation water.

Cotton: Grown as a traditional crop, cotton does not pose a potential risk since it is planted in combination with other crops. On the other hand, erosion and pest problem could occur if it is promoted as a monoculture through the introduction of cotton gins with capacity to process large volummes of cotton. Regardless of where it is grown, as a monoculture cotton rapidly develops major pest and pesticide use problems. It should be noted that the introduction of the pink bollworm, *Pectinophora gossypiella*, resulted from the uncontrolled movement of cotton seed from other areas, such as the Peruvian coast.

Yuca, a native crop, which grows best in acidic, poor soils, is one of the most important crops for the low resource farmers in the region. In spite of being grown mainly on slopes, it actually protects the soil because its high leaf surface area function as an umbrella, cushioning the impact of raindrops, allowing for a better soil infiltration rate, and improving the possibility of growing a secondary crop in the same plot.

Cacao: This is another crop that is well-adapted to high selva ecological conditions and which could benefit from CSD Project support. Cacao production in Perú has decreased dramatically in recent years. Factors that have contributed to its decline include: decrease in world market prices, use of unsuitable genetic material, arrival of diseases, such as moniliasis and black rot, and crop abandonment by farmers who have turned to coca production. For instance, the Naranjillo Agroindustry Cooperative in Tingo María reports that its membership has decreased from an all-time high of 6,430 in past years to between 1,220-2,0000 at present. Of 4,150 ha of cacao plantations currently registered in the region, about 1,000 ha are actually under management and producing. Most cacao plants in Peru have grown too tall for proper management and need to be replaced. In addition, suitable crop production technologies need to be adopted to ensure high yields and better disease control. Under optimum

conditions and management, cacao production can be as high as 4,000 kg/ha. In Ecuador and Costa Rica, where cacao production technologies are more advanced, production averages 500-1,000 kg/ha. In contrast, in the Project area, cacao production is about 50-70 kg/ha. This another crop that could benefit from Project support, as demand for cacao continues to be high both nationally and internationally.

6.3.1.2 Nontraditional Crops

When promoting nontraditional crops such as oil palm, lemon tea, and spices the Project must consider potential deforestation and erosion effects, as well as solid and liquid waste disposal issues associated with the agroindustrial activities. Thus, potential environmental impact problems associated with the introduction of new agroindustries will be mainly those related to air and water pollution. Indirect effects will include road construction, needed to handle the increased movements of farm products and the resulting uncontrolled migration of people who will arrive looking for jobs or land for cultivation. Additional comments are provided in section 6.4.1.

6.3.2 Potential Impacts and Mitigative Measures

6.3.2.1 Crop Management

Potential adverse impacts	Mitigative measures
• Environmental degradation (soil erosion and compaction, soil and water contamination with chemicals) due to the proliferation of monocultures.	• Adopt environmentally sound crop production practices, including agroforestry, and minimize the use of the more toxic agrochemicals.
• Farming in ecologically unsuitable areas and without soil conservation practices.	• Promote crop production on the basis of crop requirements and land suitability. Adopt PRONOMACHS land conservation practices.
• Soil loses its fertility and farmers cannot afford to buy fertilizers.	• Apply organic fertilizers (compost, earthworm-generated humus, manure). Rotate or interplant main crop with legumes, such as beans. Plant legumes, such as Erythrina, as live fences.

6.3.2.2 Soil Management

Potential adverse impacts	Mitigative measures
• Soil erosion due to removal of protective organic material from soil surface as forests are cleared.	• Avoid clearing vegetation during rainy season. Adopt a rational forest clearing policy that includes hillside protection.
• Erosion risks increase after harvest.	• Replant as soon as possible after harvest. Harvest only during dry season.
• Hillside farming, vertical rows, and vegetation clearing leads to soil erosion and slides.	• Minimize hillside farming, plant in horizontal rows, avoid clearing vegetation, and adopt PRONAMACHS soil conservation practices.
• Soil nutrients are lost due to loss of organic matter, soil compaction, and soil loss due to water runoff.	• Use mulch, replace organic matter, and plant legumes to build up soil. Do not clear vegetation during rainy season, and adopt rational measures when dealing with hillsides and swamps.
• Removal of plant cover leads to increased surface soil temperature, destroying soil biota involved in breakdown of organic matter.	• Avoid indiscriminate forest clearing and adopt agroforestry techniques.
• Soil compaction alters soil structure, water filtration decreases, and water runoff increases.	• Apply PRONAMACHS soil management techniques and, if necessary, break hardpan with adequate equipment.
• Soil fertility lost due to inappropriate soil selection.	• Base agriculture development on appropriate soil capacity studies and considerations.
• Soils are reduced under flooded rice cultivation.	• Rotate flooded rice with crops that can prosper in wet soil left after rice harvest.

6.3.2.3. Irrigation

Potential adverse impacts	Mitigative actions
• Quality of surface and ground water deteriorates due to increased salinity and contamination with toxic products. Aquaculture and drinking water affected	• Base irrigation schemes on sound water management principles and minimize use of agrochemicals.
• Soil saturation	• Regulate use of irrigation water. Establish and maintain adequate drainage systems. Use concrete irrigation ditches to prevent filtration. Adopt sprinkling irrigation.
• Soil erosion	• Design rows to conform to the terrain incline. Design slow-forming terraces.

6.3.3 Capabilities of Implementing Agencies in Environmental Assessment and Monitoring

There is little capability in environmental monitoring and natural resources management in the Project implementation area. In Peru, these responsibilities are distributed over numerous ministries and agencies. The recently created National Institute of Natural Resources Management (INRENA) is responsible for developing environmental programs and criteria within the agricultural sector, but it has neither the personnel nor the experience to deal with environmental impact studies or monitoring. Other institutions, such as APODESA, INADE, INIA, UNAS, and PEAH have qualified staff in their respective areas of expertise, but lack the capability to provide assistance in the environmental aspects of the CSD Project. The Alto Huallaga Special Project (PEAH) does have an environmental unit, but it has very limited human and financial resources, which limits its effectiveness.

The Universidad Agraria de la Selva (UNAS) in Tingo Maria is developing a graduate (M.S. level) program in agroecology and should be supported by the CSD Project. NGOs, such as the Research, Education, and Development Center (CIED) and Asociación Amazonia, based in Lima, have some experience in environmental issues, including environmental impact assessment capabilities. International NGOs, such as CARE and CARITAS, have environmental monitoring guidelines of their own.

6.3.4 Recommendations for Strengthening the Capabilities of Implementing Agencies in Environmental Assessment and Monitoring

The Project should provide training in environmental and natural resources management to all technical staff involved in any aspect of technical assistance,

extension, or technical activities. Training sessions will be mainly 3-5 day workshops and seminars in at least the following themes: natural resources management, environmental policies and trends, soil conservation and management, crop management, irrigation systems, agricultural extension, agricultural research, hillside agriculture, and agroforestry. Initially, there should be a strong emphasis on making project technicians aware of the need to keep environmental issues in mind when implementing project activities, using to the extent possible this PEE and its annex as guiding documents. Training programs should be implemented on a continued basis, for the duration of the Project. An illustrative budget for this training program is provided in Appendix I, section VI.

6.4 Recovery of Agriculture: Crop Protection

The CSD Project will support the farming of traditional food crops, such as rice, corn, yuca, cotton, beans, and bananas, as well as nontraditional crops, such as palm oil, palm hearts, lemon grass, macadamia nuts, tropical fruits, spices, medicinal plants, and mulberry trees will be promoted. The expansion of certain forms of agriculture in these regions could result in the intensification of pesticide use and pesticide-related health and environmental impacts.

6.4.1 Generic Environmental Assessment

Recent experience with nontraditional export crops in Central America and Caribbean countries shows that the introduction of new crops into tropical and subtropical regions is often followed by outbreaks of serious pest problems. In response to increased pest damage, pesticide use may increase dramatically as some pest organisms develop resistance and new pests emerge as their natural enemies are decimated. This type of agriculture often becomes overly dependent on crop protection chemicals, to the extent that the potential economic benefits expected from these inputs are offset by their cost, and a promising operation may become unprofitable within a few seasons.

The introduction of monocultures, often under irrigation, often aggravate pest problems by providing a vast and continuous food supply in space and time to potential pest species. In tropical and subtropical areas, irrigation eliminates the natural discontinuity that each year disrupts the growth of pest populations during the dry season. Crops grown during the dry season thus serve as corridors through time, providing a continuous food supply and shelter for certain pest species throughout the year.

Additional potential environmental and health impacts are the hidden costs or externalities associated with the excessive and/or improper use of pesticides. Severe and lasting environmental contamination and health problems can result from improper pesticide application techniques, failure to use safety application equipment, improper

mixing and loading operations, washing application equipment and pesticide containers in streams, improper pesticide storage practices, improper disposal of pesticides and empty containers, illicit use of cancelled or severely restricted pesticides, accidental pesticide spills, and contamination through pesticide drift, leaching, and transport in runoff water.

An immediate consequence of improper pesticide use can be acute human intoxication resulting from direct exposure to pesticides. Those at greater risk are pesticide applicators, field workers, farmers, their respective families, and the general rural population. Exposure to low pesticide levels over long periods can lead to various well-documented chronic health problems, including respiratory ailments, allergies, skin ailments, sterility, birth defects, propensity to tumor formation, and even cancer. In addition, consumers of fresh or processed commodities containing pesticide residues that exceed acceptable levels, i.e. those established by EPA or WHO/FAO, can also be at risk of developing long-term health problems.

6.4.2 Potential Impacts and Mitigative Measures

There are no specific plans for the procurement of pesticides under the CSD Project. On the other hand: 1) The Project will provide intermediate credit to beneficiary farmers, part of which will undoubtedly be used to purchase pesticides; 2) Much of the Project assistance will support agricultural activities. Except for subsistence agriculture, the farming of very few crops can succeed without the use of at least some pesticides; 3) The project will provide technical assistance in crop production. In this regard, pest/pesticide management is an integral part of agriculture, as important as fertilization, soil management, irrigation, and other agronomic practices. The relative severity of pest problems can make or brake an agroindustry, and this issue cannot be ignored or left to the criteria of often poorly trained agronomists; and 4) The Project may, eventually, choose to support the procurement or use of pesticides when dealing with specific pest problems affecting a key target crop. This assessment and the recommendations and pesticide use guidelines provided are designed to deal with any or all of these eventualities.

6.4.2.1 Pesticide Procurement and Use

According to 22 CFR 216, any pesticide procurement or use must be approved by AID/Washington. Whenever the requested pesticides **are not** registered by the Environmental Protection Agency (EPA) for similar uses and without restrictions, the proposed pesticide use must be subjected to an Environmental Assessment (EA) that conforms to the requirements set forth in 22.CFR.216.3(b). Even if the requested pesticides are registered by EPA for the same or similar uses and without restrictions, the Mission must still prepare an Initial Environmental Examination (IEE) that for all practical purposes is the same as an EA for pesticide use. The use of restricted use pesticides (RUPs) or pesticides not registered by EPA is seldom approved by

AID/Washington. It should be noted that few tropical crops, such as some of the nontraditional crops to be proposed by the Project, have any pesticides approved by EPA, which complicates the AID approval process. Because pest problems and pesticide use requirements change through time and often EPA approved pesticides are not available in the host country, blanket generic pesticide use EAs have not been too effective in the past. Because the approval of pesticides is crop-specific, the Project will not be in a position to request pesticide approval until its target crops have been identified.

6.4.2.2 Technical Assistance and Training

The Project should ensure that technical assistance or training activities in crop production provided to farmers includes pesticide management and, to the extent possible, crop-specific integrated pest management (IPM). This can be achieved by ensuring that Project extensionists and technical assistance personnel are trained in these areas. Additional information on suitable short-term training in pest and pesticide management is provided in section 6.4.4.

6.4.2.3 Restricted Use Pesticides

At present there are no state-regulated pesticide application certification programs in Peru, comparable to those in the U.S., and practically any one can purchase and apply any pesticide. In the U.S., pesticides considered to be highly toxic (toxicity class I) or to pose an undue risk to the environment are classified as Restricted Use Pesticides (RUP) by EPA (see Table 3) and may only be purchased and applied by licensed applicators or under their supervision. This project should not distribute, recommend the use, or approve the procurement of RUPs, unless it can satisfy itself that the users will be qualified pesticide applicators.

If the project ever plans to supply RUPs or their equivalent, it must then request and secure approval for RUP pesticide use from AID/Washington, on a case by case basis. The use of RUPs in an AID project is very seldom approved. Conditions for their approval would include recruiting qualified pesticide application personnel and/or supporting a pesticide use safety training program for potential users comparable to pesticide use certification training programs in the U.S.

6.4.2.4 Pesticide storage

In the event that any project activity supports the procurement and distribution of pesticides, it must be ensured that all such pesticides are kept under the supervision of qualified project personnel and under appropriate storage conditions. All pesticides must be stored in a solid, secure, and well-ventilated structure, designed to protect its contents from extreme heat and rainfall and located away from food, feed, and water sources. A pesticide warehouse must be clearly identified with a sign bearing the words

"PELIGRO - VENENO" and the universal skull and cross bones danger symbol, and it must always be kept securely locked when not in use. Pesticide warehouses must be supplied with a wash area for pesticide containers and spray equipment. This system should consist of a cement collecting area where the water used to rinse containers and spray equipment can be contained for re-use or disposal. It should also be located at least 200 m from any wells or water sources. The project should also request specific instructions from the manufacturers regarding special fire-fighting procedures in case of fire. In addition, it must be provided with shower facilities for first aid treatment in case of accidental spill.

6.4.2.5 Containers and Labels

Pesticides must be always kept in their original containers and should never repackaged. As required by Peruvian law, each pesticide container must display the original manufacture label, in Spanish. The label should contain, at a minimum, the following information: product trade name, net contents, concentration of active ingredients, toxicity category and signal word (caution, warning, danger), directions for use, safety precautions, re-entry statement (if applicable), environmental hazards, storage and disposal instructions, and first aid guidelines and statement of medical treatment.

6.4.2.6 Container Disposal

The project must ensure that pesticide containers are disposed of properly. Universal disposal procedures require that empty pesticide containers are crushed and buried in determined sanitary fields. The standard procedure, as required by EPA, is to rinse containers three times with water, use or dispose of rinse water, and then puncture the containers to prevent the possibility of re-use before disposal.

6.4.2.7 Accidental Poisoning

The project should ensure that local hospital staff are familiar with the symptoms and treatment of intoxication by the pesticides that it uses or supplies. If these include carbamate and organophosphate pesticides, then the project should ensure that the main antidote, atropine sulphate, is locally available, in the event of accidental intoxication.

6.4.2.8 Protective Equipment and Pesticide Safety Information

The project should supply appropriate protective equipment to spray personnel, as needed. The project pesticide management advisors should also recommend protective clothing and equipment to match pesticide use requirements, as recommended in the product label. In the case of the less toxic pesticides, this may be limited to wearing shoes and long-sleeved shirts and trousers. The application of many insecticides, on the other hand, require the use of safety goggles, rubber gloves and

boots, and a pesticide application suit. The project should also acquire and distribute safety posters and other pesticide management and safety extension materials, along with extended versions of the pesticide label, in Spanish. These materials should be requested from pesticide manufacturers and suppliers.

6.4.2.9 Summary of Potential Impacts and Mitigative Measures

Potential adverse impacts	Mitigative measures
• Indiscriminate pesticide use contaminate soil and waterways, affecting quality of drinking water and of aquatic habitats.	• Apply pesticides only when absolutely necessary and within context of IPM. Use action thresholds. Provide guidance to farmers in pesticide management.
• Intoxication of pesticide applicators, farmers, and farm workers due to direct exposure to pesticides	• Provide training to farmers in pesticide management and safety techniques. Avoid using highly toxic pesticides (Tables 2 and 3, p. 12).
• Destruction of nontarget organisms, including beneficial insects (predators, parasites, and pollinators); emergence of new pests due to decimation of natural control (biocontrol) component. Target pests develop pesticide resistance.	• Apply pesticides only when absolutely necessary and within context of IPM methods. Use action thresholds. Learn to correctly identify pest organisms. Use nonchemical control approaches, such as biocontrol, crop rotation, and mechanical control. Use "soft" pesticides (oils, soaps).
• Contamination of waterways due to improper disposal of pesticide containers, washing pesticide containers and application equipment, and having mixing/loading operations in or near streams and other water bodies	• Provide guidance to farmers in appropriate pesticide disposal procedures. Wash containers and equipment in specifically designed areas, never in streams or rivers. Dispose of containers appropriately (p. 30).
• Accidental poisoning, due to improper pesticide storage	• Provide guidance to farmers regarding safe pesticide storage procedures (p. 29).
• Excessive pesticide residues remain on fresh produce and other food crops.	• Apply pesticides according to label instructions. Do not exceed recommended doses or apply after last recommended application before harvest.

6.4.3 Institutional Capabilities in Pest and Pesticide Management

Capabilities in IPM and pesticide management are quite limited in the organization responsible for implementing the CSD Project. On the other hand, there are in Perú several institutions that can provide in country short-term training and

technical assistance in these areas, as needed. These include the International Potato Center (CIP), the Agricultural Development Foundation (FUNDEAGRO), the National Agricultural University, La Molina (UNA), the National Service of Agricultural Sanitation (SENASA), the Useful Insects Research and Rearing Center (CICIU), and the National Agricultural University of the Selva (UNAS). International centers with recognized expertise in IPM and pesticide management include the Tropical Agricultural Research and Training Center (CATIE), Costa Rica, and the Panamerican Agricultural School (EAP), El Zamorano, Honduras.

6.4.4 Recommendations for Strengthening the Pest and Pesticide Management Capabilities of Implementing Agencies

All project staff who will provide technical assistance or training to farmers in any aspect of crop protection under the CSD Project should receive short-term training in pesticide management and IPM basics. Typically, basic pest/pesticide management workshops and short courses are 5-10 days long and include areas such as: classification, toxicity and mode of action of pesticides; product label contents and instructions; calibration of spray equipment; pesticide application procedures; safety measures and protective equipment; environmental and health consequences of pesticides use; special crop-specific pest/pesticide interactions and needs; recognition of common pest organisms and their natural enemies; and basic IPM concepts, such pest monitoring and sampling techniques, application of action thresholds, and biological control and other nonchemical pest management methods.

6.5 Recovery of Livestock Production

One of the activities planned under the CSD Project is to increase cattle production in selected sites in an effort to recover former production levels. At present, livestock production in the high selva is limited to small herds of "criollo" cattle, often interbreed with Brahma breeds. Cattle is reared for both beef and milk, all of it for the local market, as local transportation is highly restricted. Swine are also reared locally, as a family activity.

6.5.1 Generic Environmental Assessment

The main environmental concern of increased livestock production in project sites that support primary and secondary growth tropical forests entails the destruction of forest cover and associated vegetation and their replacement with pastures. A closely related concern involves the impact on the wildlife which inhabits such forests. When identifying cattle production ventures for assistance, the project must also consider the relative inefficiency of energy utilization inherent to cattle production, relative to grain production or the production of alternative livestock, such as swine; microlivestock, such as cuy; and poultry. For instance, it takes seven kg of grain to produce one kg of beef, four for pork, and two for poultry.

In the Project implementation area, cattle ranching has caused pasture degradation due to overgrazing. Soils are often fully compacted, greatly reducing the rate of water filtration, which in turn results in increased water runoff. As a result, grasses grow poorly, often reaching a maximum length of a few centimeters. Overgrazing leads to pasture degradation and loss of plant cover, leading to soil erosion. The movements of cattle invariably cause soil compaction and may carve deep paths on hillsides, which often become creeks, all of which contributes to erosion.

The introduction of livestock into new areas may generate competition with local wild herbivores and may elicit the hunting of wild carnivores if these are perceived as potential predators.

The common locally common practice of periodically burning the prairies to regenerate the pasture and eliminate ticks can result in forest fires, damage to the biotic component of the upper soil layer, and increase soil erosion.

6.5.2 Potential Impacts and Mitigative Measures

The project should ensure that those implementation areas which have been found to be suitable for livestock production retain some forest cover, including plant species with foliage and fruit suitable for cattle consumption. This approach would increase the sustainability of livestock production, while conserving part of the forest cover. For instance, the project may consider supporting swine production and related small ham, sausage, bacon and cold cuts processing industries for both local and export markets. Pork has a great deal of acceptance in these regions, where pigs are already being reared by the local inhabitants, on a very small scale. Swine production could be greatly expanded if young *purmas* (pioneering vegetation types that subsist in deforested areas), which include numerous highly nutritious plant species, are used as a food source for swine.

Potential adverse impacts	Mitigative actions
• Deforestation and removal of other native vegetation due to expansion of pasture lands	• Conduct land use studies and avoid replacing native vegetation in areas unsuitable for livestock production.
• Displacement or reduction of native fauna, disruption of wildlife migration routes, increase of poaching, and destruction of wild carnivores perceived to be potential predators.	• Base livestock promotion activities on land carrying capacity studies that consider wildlife. Establish wildlife refuges as needed. Promote ranchers' awareness of wildlife conservation needs and strictly enforce anti-poaching laws.
• Pasture degradations through overgrazing	• Regulate cattle populations and grazing periods, reseed degraded pastures, and locate water holes and salt selectively to guide grazing
• Destruction of native vegetation and wildlife habitats due to uncontrolled burning activities.	• Introduce alternatives to pasture burning. If absolutely necessary, any controlled burning should be carefully planned and executed.
• Degradation of hillsides and fragile lands due to cattle activities and increase in water runoff due to soil compaction.	• Restrict cattle access to hillsides and fragile lands. Adopt soil conservation practices, such as filtration trenches and minimum tillage.
• Lowering of water table and degradation of native vegetation in the vicinity of water holes during drought periods.	• Set up many small water sources, strategically located and based on number of heads and time of the year.

6.5.3 Capabilities of Implementing Agencies in Environmental Assessment and Monitoring

At present there is no institutional capacity in neither the public nor the private sector to deal with the environmental effects of livestock production activities. Section 6.3.3 addresses similar needs in the environmental impact assessment capabilities of agriculture, which are equally applicable to livestock activities.

6.6 Introduction of Exotic Species

The Project plans to support the introduction of exotic species, such as *Tilapia* spp. The main environmental concern with the introduction of any exotic species, whether terrestrial or aquatic, is the potentially disruptive impact that such event may have in the affected ecosystem. Introduced exotic species may escape, colonize new habitats, and successfully compete with or pray upon native species. In the first case, certain competing species may be displaced. If the exotic species is a predator, populations of prey species may dwindle and become rare.

6.6.1 Generic Environmental Assessment

The potential consequences of introducing exotic animals into the Amazon region has been a main concern in recent years, although, with a few exceptions, little documented information exists on the subject. The rainbow trout, *Orcorynchus mykiss*, introduced in the mid 1960s, has partially displaced species of the fish genus *Astroblempus* in the Rio Aviseo National Park, to the extent that their populations may have decreased in recent years. A 1989 study shows that the trout was present in 50% of collecting stations, but native species were found in only 15% of them. However, by 1990, the exotic species was found in 40% of streams sampled, while native species were collected in 50% of them.

In Lake Titicaca, Puno, the introduction of trout and the pejerrey, *Odonthestes bonariensis*, resulted in the displacement of native fish species. The trout population increased to the point that the lake's carrying capacity was exceeded as its food supply (smaller fish) was depleted.

Tilapia rendalli is a species that has been introduced into natural and man-made ponds, where it readily breeds. Tilapia fish can represent a relatively cheap source of protein and, in their immature stage, readily feed on mosquito larvae, contributing to their control. Although the seeding or stocking of Amazon waterways with any species of Tilapia is now illegal in Peru, these fish are generally considered by Peruvian ichthyologists to be poor competitors and, therefore, to have poor chances of surviving were they to escape into natural habitats. In the river systems of the high and low selva regions there are native piscivorous fish, such as *Hoplias malabaricus*, that would likely prey on Tilapia and keep it from becoming established. Furthermore, Tilapia requires still waters for breeding, and although it could theoretically become established in ponds and small lakes, it could not do so in streams or rivers.

The common carp, *Cyprinus carpio*, and the Malaysian shrimp, *Macrobachium rosembergii*, have also been introduced into the Amazon region with moderate economic success and without known adverse environmental effects. For instance, in the Chanchamayo area alone, there are over 100 families that derive their livelihood mainly from Tilapia fish aquaculture, and in other areas of the San Martin department, the rearing of the Malaysian shrimp is gaining importance as a productive enterprise.

6.6.2 Potential Impacts and Mitigative Measures

It is essential that any proposed introduction of exotic species under the CSD Project be subject to an environmental assessment, as required by the Peruvian Código del Medio Ambiente y los Recursos Naturales, as well as to rigorous monitoring of potential impacts during the project implementation, in order to safeguard the integrity of the local aquatic fauna. Furthermore, whenever possible, the rearing of native species should be given preference over introduced ones.

Potential adverse impacts	Mitigative actions
• The introduction of exotic species for commercial production may disrupt fragile ecological interactions and cause the decline or even extinction of native species through predation or displacement.	• No exotic species should be introduced into the Project area without an exhaustive environmental assessment of potential ecological impacts or comparable evidence that ensures that such species will not adversely affect the native biota or food chain relationships. • Whenever possible, explore the commercial potential of native species and support these in preference to exotic species.

6.6.3 Capabilities of Implementing Agencies in Environmental Assessment and Monitoring

See Sections 8.0 and 9.0.

6.7 Reforestation Activities

The impact of slash and burn practices, inappropriate agriculture such as hillside maize farming, and illicit coca production and processing activities in the project implementation area have resulted in the destruction of large tracts of primary and second growth tropical forests. Under its environmental component, the CSD Project will support reforestation activities.

6.7.1 Generic Environmental Assessment

Main environmental concerns associated with this activity are the potential destruction of primary forests or secondary forests in advanced second growth in favor of plantation forests and the ecological and economic suitability of tree species selected for reforestation programs.

Once a portion of forest has been eliminated or severely degraded, reforestation, through the selective introduction of tree plantations, is the best alternative for bringing back land productivity, halting soil erosion, protecting threatened watersheds, and restoring some of the lost habitat for many animal and plant species. Reforestation may also include agroforestry techniques, designed to integrate tree species having economic value as live fences, wind-cover, and for fuel wood or fruit production, with crop production.

Under the Reforestation Project in Rioja, San Martín, INRENA plans to use the following tree species: *Columbrina glandulosa* (shaina), *C. odorata* (cedro), *S. macrophylla* (caoba), *Hura crepitans* (catahua), *Calycophyllum* sp. (capirona), *Ochroma*

lagopus (palo balsa), *Aniba* spp. (roble amarillo), *Inga* sp. (guaba), *Guazuma crinita* (bolaina), *Anadenantherea* sp. (huayo), *Tabebuia* sp. (guayacán), *Sickingia williamsii* (pucaquiro), *C. catenaeformis* (tornillo), *A. cearensis* (ishpingo), *Schizollobium amazonicum* (pino chuncho), *Calophyllum* sp. (lagarto caspi), *Hebea* brasiliensis (jebe), *Bixa orellana* (achiote), *Bertholetia exelsa* (castaña), *Eugenia jambos* (pomarrosa), *Terminalia catapa* (almendro), and *Croton draconides* (sangre de grado). Several species of palm trees, such as pijuayo, ungurahui, and aguaje, will also be used.

The Agroforestry Project in Pucallpa is introducing mixed plantations of fast growing species, such as tornillo, marupa, goma huayo and pashaco. The Reforestation Project of Cerro Escalera, department of San Martin, which seeks to protect watersheds, uses mainly *S. mcrophylla*, *Anibe* sp, *C. catanaeformis*, *Brosimun* sp. (manchinga), *Ormosia* sp. (Huayruro), and *Caryocar* sp. (almendra). Finally, the Proyecto Utilización Industrial de Nuevas Especies Forestales en el Perú, has conducted research on tree species suitable for reforestation, partially because of their potential for various industrial uses. These species include: *Calicophyllum spruceanum* (capirona), *Paramachaerium ormosioides* (aguano mosha), *Miroxylon balsamun* (estoraque), *Coumarouma* sp. (shihuahuaco), *Brosimun utile* (anguana), *Brosimun calicastrum* (Manchinga), *Ficus* sp. (oje renaco), *Erysma bicolor* (cedrillo), and *Aspidosperma macrocarpon* (pumaquino).

As shown, there are numerous tree species that could be used in reforestation programs, depending on objectives and needs. One of the challenges faced by the such programs is finding in the first place the necessary genetic material of the right quality and in sufficient quantity to ensure success from the nursery stage on. Most of these species are adequate for commercial wood production, as well as nonwood products. When planted on steep hillsides, these species also help restore soil integrity and reduce erosion, which in turn helps to protect watersheds.

There are very few studies which address the habitat and food needs of wildlife in relation to reforestation programs, and little information exists on the appropriate mix of tree species needed to provide a suitable habitat for wildlife. Some of the tree species which produce fruits eaten by some tropical forest animals are listed in the Tropical Forest Ecology portion of Section III, Appendix 1.

6.7.2 Potential Impacts and Mitigative Measures

The project must carefully evaluate proposed reforestation activities relative to available information on tree species suitability and composition and reforestation approaches. There are several ongoing reforestation programs in the project area, which should be tapped for information and expertise. For instance, through a reforestation project in the Pichis valley, focusing on precious wood and other forest products, INRENA will plant 150 ha with species such as sangre de grado, *Croton lechleri* (bark has pharmaceutical uses); tornillo, *Cedrolinga catenaeformis* and

ishpingo, *Amburana cearensis*, for various nonwood uses; and *Cedrela odorata* (cedro) and *Suretema macrophylla* (caoba) for wood production.

6.7.2.1 Surface and Ground Water

Potential adverse effects	Mitigative actions
• Use of herbicides to remove unwanted species may affect aquatic life and quality of drinking water.	• Avoid applying herbicides. Use manual labor to remove unwanted species.
• Soil erosion can lead to the rapid eutrophication of small water bodies and affect the operation of hydroelectric plants downstream.	• Avoid practices that promote soil erosion or compaction or the disruption of the surface drainage process during reforestation activities.
• The construction of small roads and dams to facilitate movement of heavy equipment may disrupt drainage process and flow of minor streams.	• Conduct survey of drainage network before beginning reforestation activities to ensure that it is not disrupted during operations.
• Selection of unsuitable tree species for reforestation may affect rainfall interception, leading to excessive runoff and evaporation, and decreased soil filtration and aquifer replenishment, as well as contribute to the soil erosion process.	• Consider suitability for rainfall interception when selecting tree species. Avoid introducing conifers in areas where precipitation is heavy, as their capacity to intercept rainfall is limited.

6.7.2.2 Soil

Potential adverse impacts	Mitigative actions
• Removal of vegetation cover interrupts the soil building process.	Make maximum use of natural vegetation cover to protect soil and maintain soil building process.
• Removal or disruption of soil layers contributions to erosion, which is especially adverse in steep hillsides. The use of heavy equipment often causes soil compaction.	• Minimize use of heavy equipment, especially on hillsides. Select tractors with wide tracks, for a better weight distribution.
• The use of herbicides for elimination of unwanted plant species affects soil biota.	• Utilize manual labor to remove unwanted vegetation, and do so only when absolutely necessary.
• The planting of nutrient-demanding tree species may lead to a rapid loss of soil fertility.	• Select reforestation species with care, using at least some nitrogen-fixing leguminous species.
• The combined effects of soil erosion, compaction, nutrient depletion, and removal of plant cover lead to increased soil temperatures and disrupts the breakdown of organic material and the growth of forest plants.	• Avoid any reforestation activities that expose the unprotected soil for long periods. Avoid removing or altering in any way the soil structure.

6.7.2.3 Native Vegetation and Wildlife

Potential adverse effects	Mitigative actions
• Elimination of a wide diversity of plant species in preparation for reforestation activities.	• Inventory plants in forest regeneration process to avoid destroying valuable species. Do not promote reforestation in areas having a unique vegetation composition or a large number of tree strata.
• Disruption of natural forest succession process in order to introduce native or exotic tree species. Temporary disruption of plant cover and forest community structure.	• Avoid clean forest clearing and always maintain some vegetation cover and maximum vegetation strata. Avoid disrupting forest canopy.
• Removal of vegetation to prepare grounds for reforestation affect soil integrity and the general ecosystem.	• Use manual labor to remove unwanted vegetation, instead of mechanical or chemical means. Avoid removing root systems that may help to stabilize the soil.
• Disruption of nutrient flow and nitrogen fixation process.	• Select tree species that contribute to forest succession and nitrogen fixation processes. If exotic species are introduced, these should be ecologically similar to native species.
• Wildlife habitat destruction and removal of species by forest workers.	• Prohibit any hunting activities among forest workers.
• Disruption of wildlife species composition, natural trophic chain, and general decrease in animal diversity.	• Identify and inventory the more important wildlife habitats, especially those contributing to their limiting factors, to avoid disrupting them during reforestation activities.

6.7.3 Capabilities of Implementing Agencies in Environmental Assessment and Monitoring

See Sections 8.0 and 9.0.

6.8 Management of Tropical Forests

The CSD Project will be implemented in a region where tropical forests constitute a major natural resource, which is being rapidly depleted. This project is in an excellent position to foster activities that forest the protection and management of primary forests.

6.8.1 Generic Environmental Assessment

One of the objectives of forest management is to provide the means to selectively harvest tree species in a sustainable manner, through the adoption of silvicultural practices that ensure that the forest retains its ecological integrity. The project will be implemented entirely in subhumid and humid tropical forests, which harbor a highly varied and complex flora. These resources have been exploited by the native inhabitants since ancestral times, and by colonists arriving over the past four centuries, primarily as a source of food, wood, and for medicinal purposes. In addition, wood is also being extracted at increasing rates for industrial and commercial purposes. In spite of the mostly unplanned and unsustainable extraction of forest resources and the increasing rate of deforestation, there still remain vast tracts of forests within the Project area that can be conserved and brought under sustainable management.

The opening of the forest canopy, the use of heavy equipment for logging operations, the dragging of timber, and the opening of roads to facilitate logging operations can all result in numerous adverse environmental impacts.

6.8.2 Potential Impacts and Mitigative Measures

6.8.2.1 Soil

Potential adverse impacts	Mitigative actions
• Soil erosion, including loss of topsoil, along with its biotic components and organic matter, as well as hillside disruption and land slides when slope is steep. Loss of the seed bank due to soil erosion.	• Base all forest utilization activities on a well-designed forest management plan, that includes building extraction roads on the least fragile areas and those that have the least incline.
• Temperature increase due to increased exposure of ground to direct sunshine, and the soil building processes is disrupted.	• When clearing a section of forest, the lower vegetation and the forest litter must be left as undisturbed as possible.
• Soil compaction leads to increase in water runoff, soil erosion, and decrease in water filtration and changes in soil structure. Decreased soil aeration causes death of small roots. Replenishment of aquifers affected.	• Build drainage ditches on hillsides to avoid disrupting the superficial drainage and any small brook or creek in the area that might later lead to hillside disruption.

6.8.2.2 Native Vegetation

Potential adverse impacts	Mitigative actions
• When highly selective, wood extraction deceases the forest value as the more valuable tree species decrease.	• A wide range of tree species should be utilized according to the forest potential and market conditions.
• Young trees, shrubs, and herbaceous species are destroyed when large trees are felled.	• Logging operations should be supervised by qualified personnel to avoid damaging fragile vegetation.
• Forest clearing favors the growth of weedy plant species which impede the growth of valuable species and interfere with forest management plans.	• Remove undesirable weedy species to allow the growth of potentially useful species.
• Soil compaction impedes the initiation of the forest succession (regeneration) process.	• Minimize activities that cause soil compaction. If soil compaction occurs, help pioneering forest species to grow in deforested areas.
• Forest management and wood extraction activities interfere with the development of some valuable forest species.	• Minimize disrupting forest canopy to avoid interfering with natural forest succession process. Avoid clean forest cutting. Select forest management techniques that do not disrupt germination of soil seed bank. Provide support to the Conservation Units, as potential germplasm banks.

6.8.2.3 Wildlife and Aquatic Species

Potential adverse impacts	Mitigative actions
• Degradation of aquatic fauna habitats and food supply due to increased sedimentation in small streams and creeks.	• Silvicultural practices or inadequate use of machinery that contribute to the erosion process should be banned.
• Degradation of wildlife habitat and food supply .	• Plant species that are a major food source or habitat component for local wildlife should be inventoried and their removal banned.
• The increased presence of people may lead to increased poaching and trapping activities.	• Hunting should be severely restricted for forest workers and the hunting of rare, threatened, or endangered species should be prohibited.
• Disruption of wildlife habitats due to the unusual presence of men and equipment during long periods and the noise and disturbance generated by their activities.	• Any long-term unnecessary concentration of personnel and machinery in the forest should be avoided.

6.8.3 Capabilities of Implementing Agencies in Environmental Assessment and Monitoring

See Sections 8.0 and 9.0

7.0 CSD Project Environmental Component

The CSD Project will support several environmental activities through its proposed Environmental Protection and Awareness component. As described in the CSD Project Paper, this Project component will provide technical assistance, training, and awareness programs in: environmentally-sound crop production practices, soil and water management, reforestation, and related environmental and natural resources management practices. The proposed environmental education program will be implemented through newspaper articles and radio messages, as well as through programs developed for schools. The environmental component will also finance reforestation of hillside areas degraded by coca production activities and seeding of degraded areas with pastures to help contain soil erosion and support livestock. The activities supported under this component will be implemented by at least one forestry/environmental specialist.

The proposed environmental component satisfies some of the recommendations provided in this PEE, especially in the area of environmental and natural resources

management training and technical assistance. However, the PEE recommendations expand significantly the role, mandate, and responsibilities of the original PP environmental component, as outlined below:

- This PEE recommends that a minimum of two individuals and the necessary operational resources (see Appendix I, section V) will be needed to implement the Project's environmental portfolio during the first three years of LOP. These two individuals will constitute the Project Central Environmental Unit (CEU).

- The CEU will implement not only the activities proposed in the CSD PP, but it will also be responsible for overseeing the implementation of the Project environmental review and approval procedures, as described in section 8.0 and illustrated in the attached operational flowchart. In addition to screening activity proposals for environmental soundness, the CEU will also visit proposed activity sites and advise NGOs, municipalities, and other potential beneficiaries on the actions needed to meet the Project environmental requirements.

- One of the main CEU objectives will be to strengthen the environmental impact assessment (EIA) capabilities of collaborating organizations in the Project area. The Project environmental training and technical assistance program will be expanded to include areas such as: environmental impact assessment and monitoring techniques, pest and pesticide management, sustainable crop production, agricultural extension and research, natural resources management, adverse environmental consequences of coca production and processing, and mitigation of potential environmental impacts of Project activities. The training and technical assistance program will constitute the main vehicle for strengthening the environmental review and monitoring capabilities of NGOs, municipalities, and other Project implementing organizations.

- During the course of Project implementation, the CEU will gradually transfer much of the Project environmental review responsibilities to INADE and its participating Special Projects. Thus, INADE and the Special Projects will participate in the implementation of Project environmental activities from the start. It is anticipated that INADE will be fully in charge of these activities by the end of the third year of project implementation.

8.0 Summary of Institutional Environmental Assessment and Monitoring Capabilities in the Project Area

Several institutions are involved, to some degree, in the implementation of environmental assessment and mitigation in Perú. The main ones are summarized below.

- The National Institute for Natural Resources (INRENA) was created in 1992 to promote natural resources conservation and management. Its functions include to

propose and coordinate natural resources management policies and evaluate the environmental impact of agricultural projects and establish appropriate mitigation measures. INRENA consists of five General Directorates in: Waters and Soils, Forests, Natural Protected Areas and Wildlife, Studies and Projects in Natural Resources, and Rural Environment. The Rural Environment Directorate is responsible for regulating the potential environmental impacts of agricultural activities, based on Environment and Natural Resources Code provisions. In practice, mechanisms for guiding the environmental assessment and monitoring process are not in place. INRENA is not fully operational at the national level, and most of its functions are implemented by other institutions.

- INADE, which operates under the Ministry of the Presidency, is the main CSD Project implementing agency. Although at present INADE has very limited institutional capacity in environmental issues, its Central Huallaga and Bajo Mayo Special Project has an environmental management unit that implements an environmental awareness and training program. This unit could be strengthened and expanded to include environmental assessment and monitoring. The Proyecto de Apoyo a la Política de Desarrollo de Selva Alta (APODESA) supports INADE projects in the high and low selva. It has moderate strengths in natural resources management, but little experience in the area of environmental assessment.

- The Ministry of Agriculture (MOA) has regional offices responsible for regulating the utilization of natural resources, including forests, water, and wildlife. Its capacity in environmental assessment and monitoring is quite limited, but could be strengthened through training.
MOA's Instituto Nacional de Investigacion Agraria (INIA) conducts research and extension in agriculture, animal husbandry, and forestry. INIA has research stations in Yurimaguas, Tarapoto, Pucallpa, Iquitos, and Tingo María. Much of its work has focused on developing sustainable crop production, forest management, and agroforestry approaches. INIA has limited institutional capacity in environmental assessment and mitigation work.

- The Ministry of Health (MOH) is responsible for the nationwide planning and management of health care centers and water and sewerage systems. The MOH has regional offices as well as provincial offices which are responsible within their area for planning, staffing, management, and supervision of such activities. The regional and provincial offices have extensive experience working with UNICEF, WHO/PAHO, and USAID-sponsored health programs. Currently, MOH provincial offices are working with INADE's projects and local governments in health care related community projects. Their participation includes assigning staff to health centers and providing training in disease prevention, as well as technical specifications for drinking water and sewerage systems. The MOH will be the main source of sanitary guidelines that will apply to construction of schools and health centers under the Project.

management, crop production, soil management, and watershed management, and b) rural environmental "brown" issues, such as water and sanitation, waste management, and road and infrastructure rehabilitation. These two individuals will comprise the Project Central Environmental Unit (CEU) and will be responsible for the implementation of the Project environmental component, overseeing the Project environmental review process, and developing and implementing a training program in environmental impact assessment. The CEU will be also responsible for providing leadership in environmental and natural resources management, within the Project area of influence, and for developing and maintaining mutually beneficial linkages with national and international organizations active in these areas. An illustrative budget for the Project Environmental Monitoring Unit is included in Appendix I, section V.

The CEU will work closely with two INADE counterpart staff, who will receive on the job training in environmental review and monitoring techniques. At the end of the third year, the environmental staff of INADE and participating Special Projects will assume full responsibility for the implementation of the Project environmental component and review procedures.

9.2 INADE Special Projects

Each participating Special Project should create an environmental unit similar to that existing in the Central Huallaga and Bajo Mayo Special Project. Each such unit should be staffed by at least two individuals with background in environmental and natural resources management. These individuals will be further trained in environmental review and monitoring procedures by the CEU during the early stages of Project implementation. The Special Project Environmental Units (SPEUs) will be part of the Project environmental review and monitoring process as soon as each unit is in place and its staff trained in environmental procedures.

9.3 NGOs, Municipal Governments, and Other Participating Organizations

The EIA and monitoring capabilities of collaborating organizations will be strengthened through: a) training, b) technical assistance, and c) direct participation in environmental review procedures. Through the CEU and SPEU combined staff, the Project will be in a position to implement a vigorous training program in environmental impact assessment and monitoring procedures, natural resources management, and mitigation of potential environmental impacts associated with Project activities. Training should be tailored to the needs of technical personnel, administrators, and decision makers, and will be presented mainly in the form of 3-5 day short courses, workshops, seminars, and field days.

Examples of relevant topics include: forest management, crop production, soil management, irrigation methods, pest/pesticide management, wildlife conservation, road and infrastructure environmental guidelines, and adverse environmental impacts of coca

OF THE CSD PROJECT

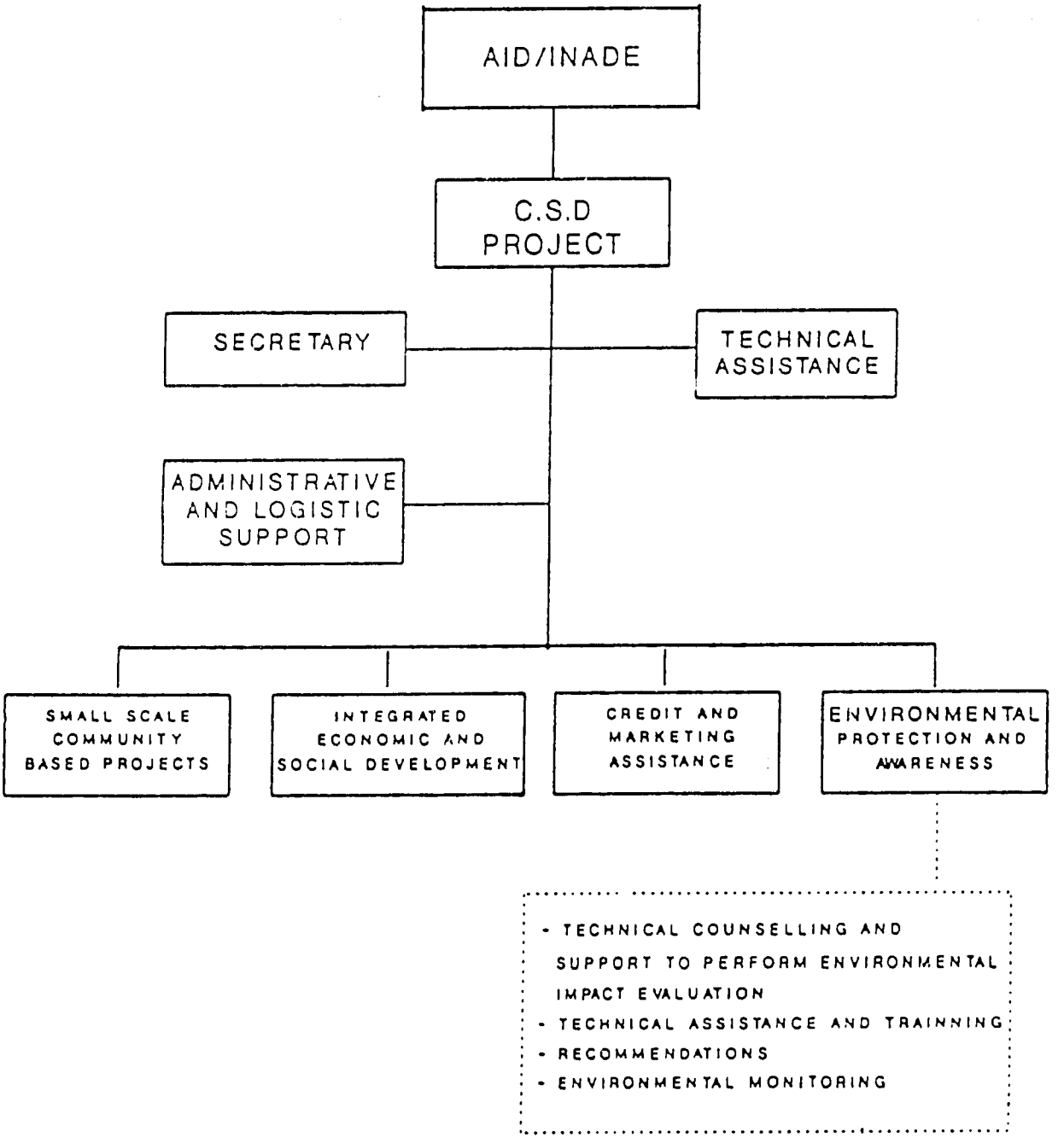
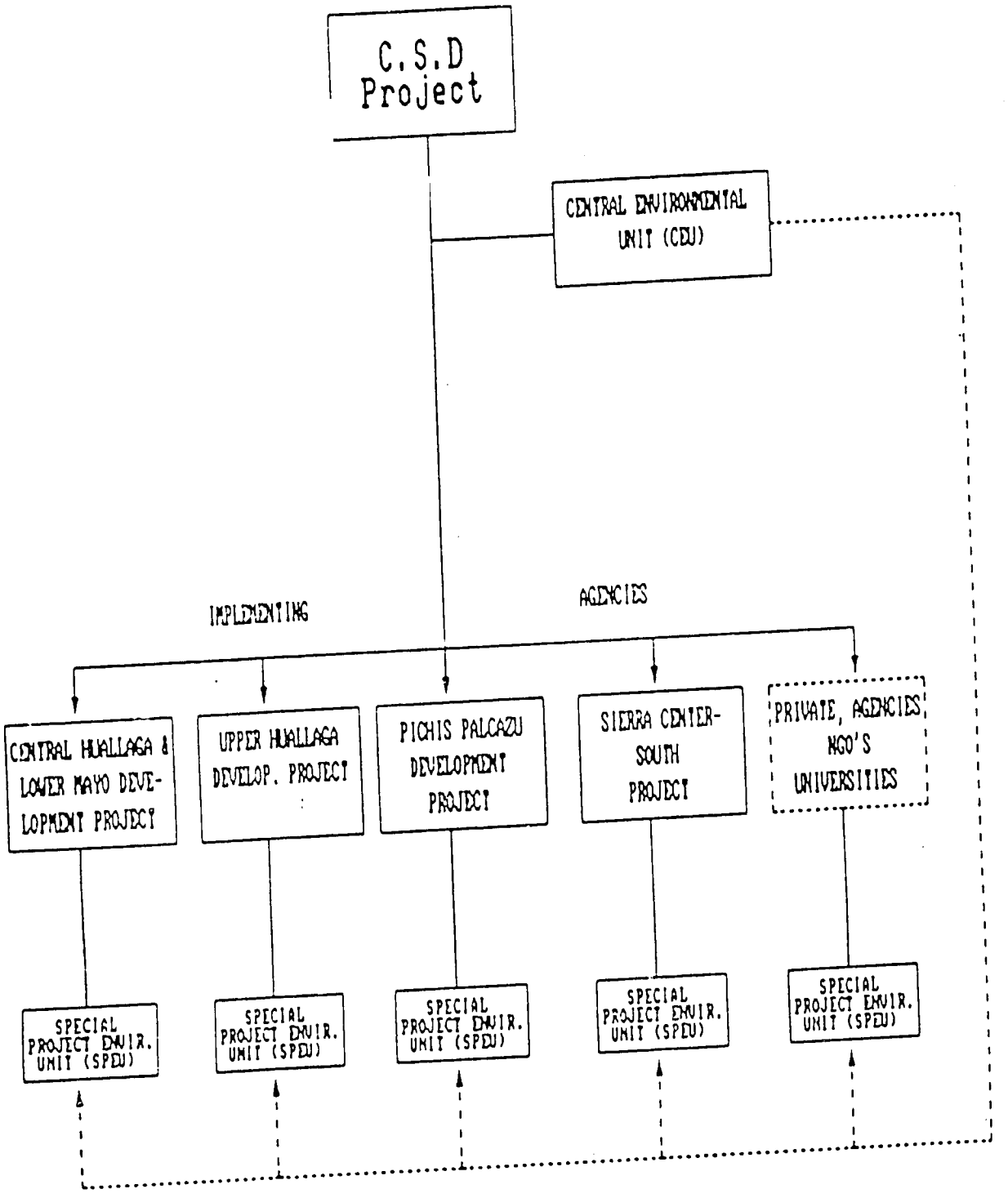


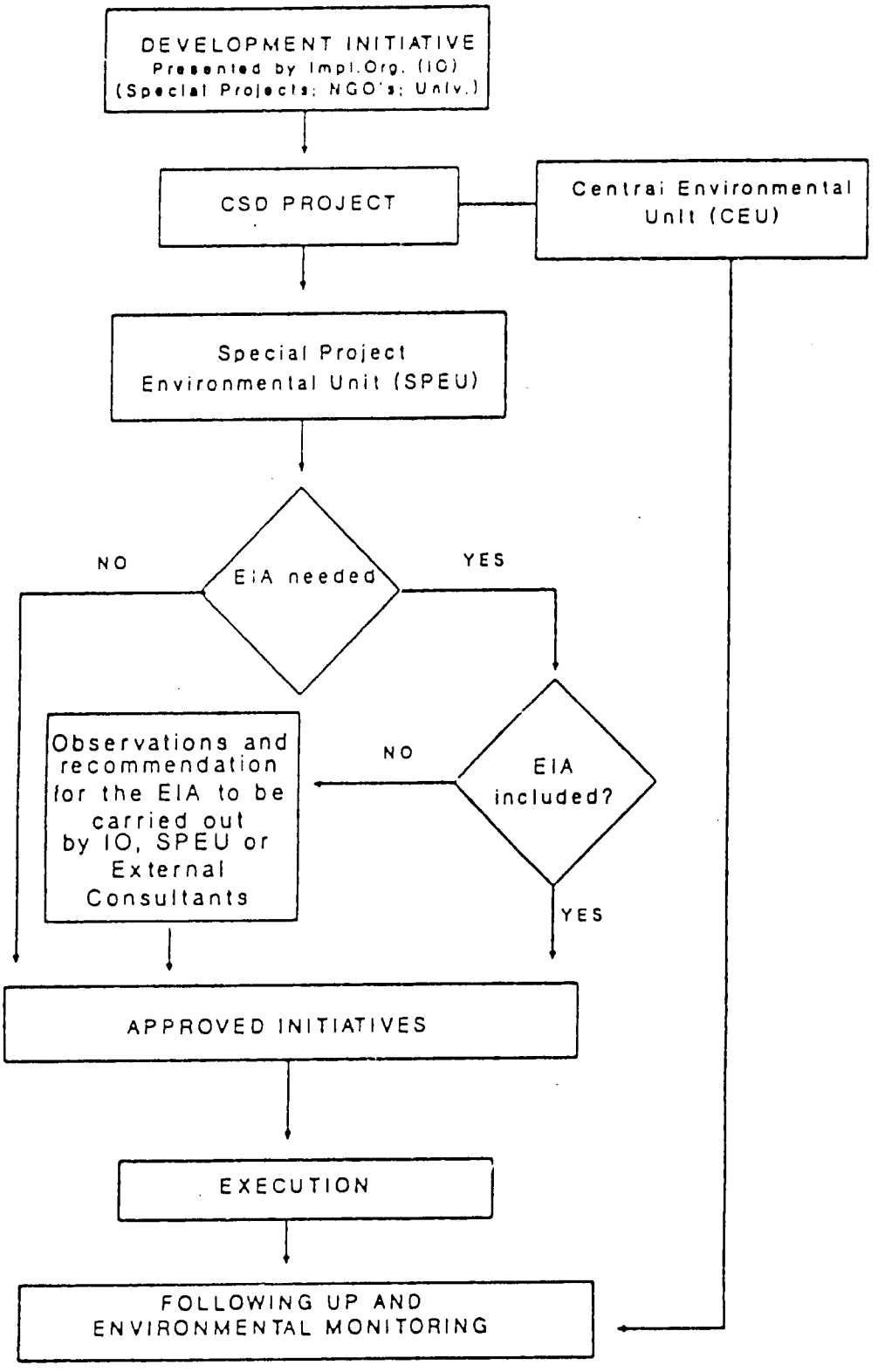
Figure 2. OPERATIONAL ORGANIZATION OF THE CSD PROJECT



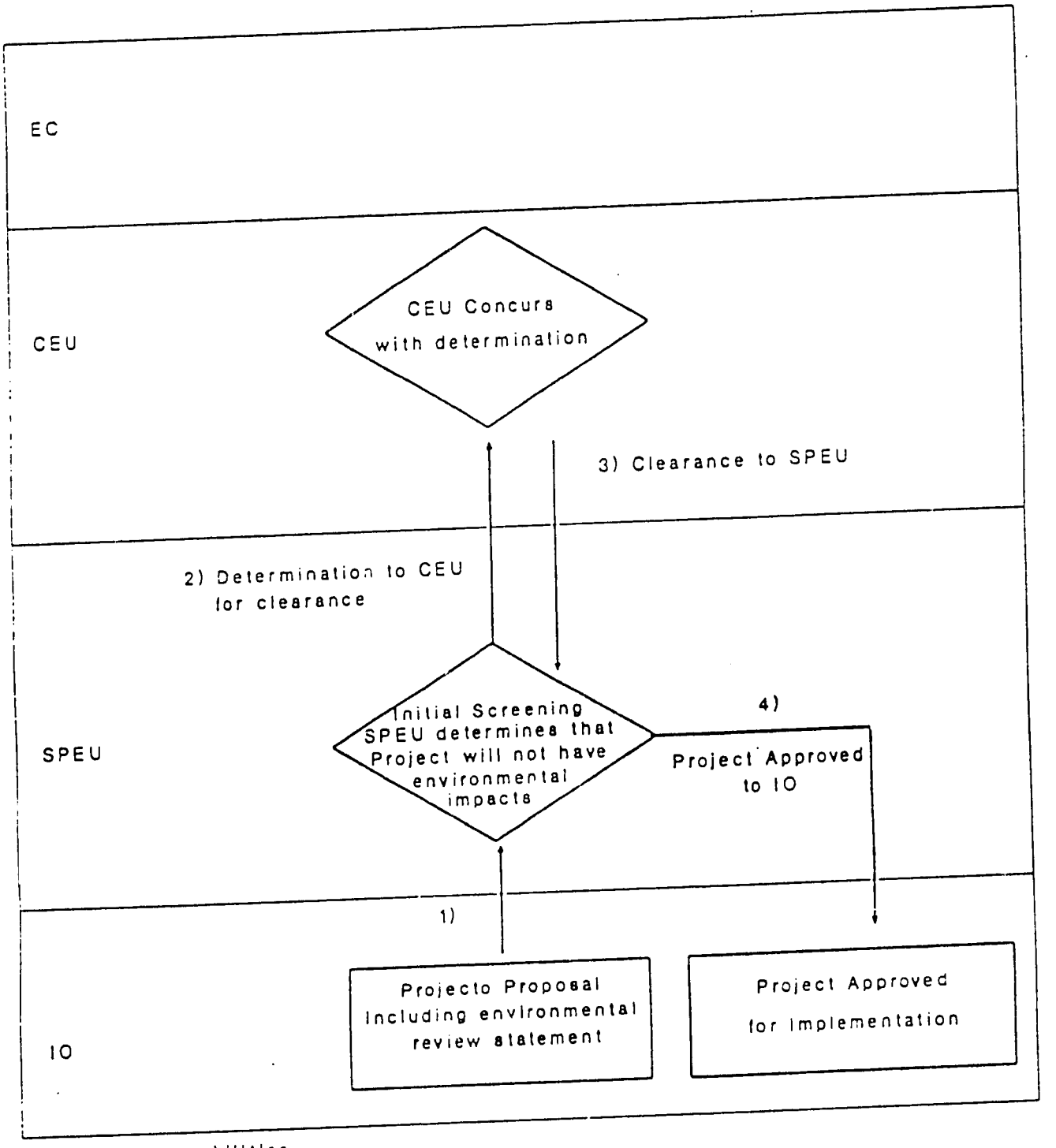
---→ TRAINING AND TECHNICAL ADVICE

⟶ FUNCTIONAL RELATIONSHIPS

(GENERAL OVERVIEW)



Case 1: Project does not require an EIA

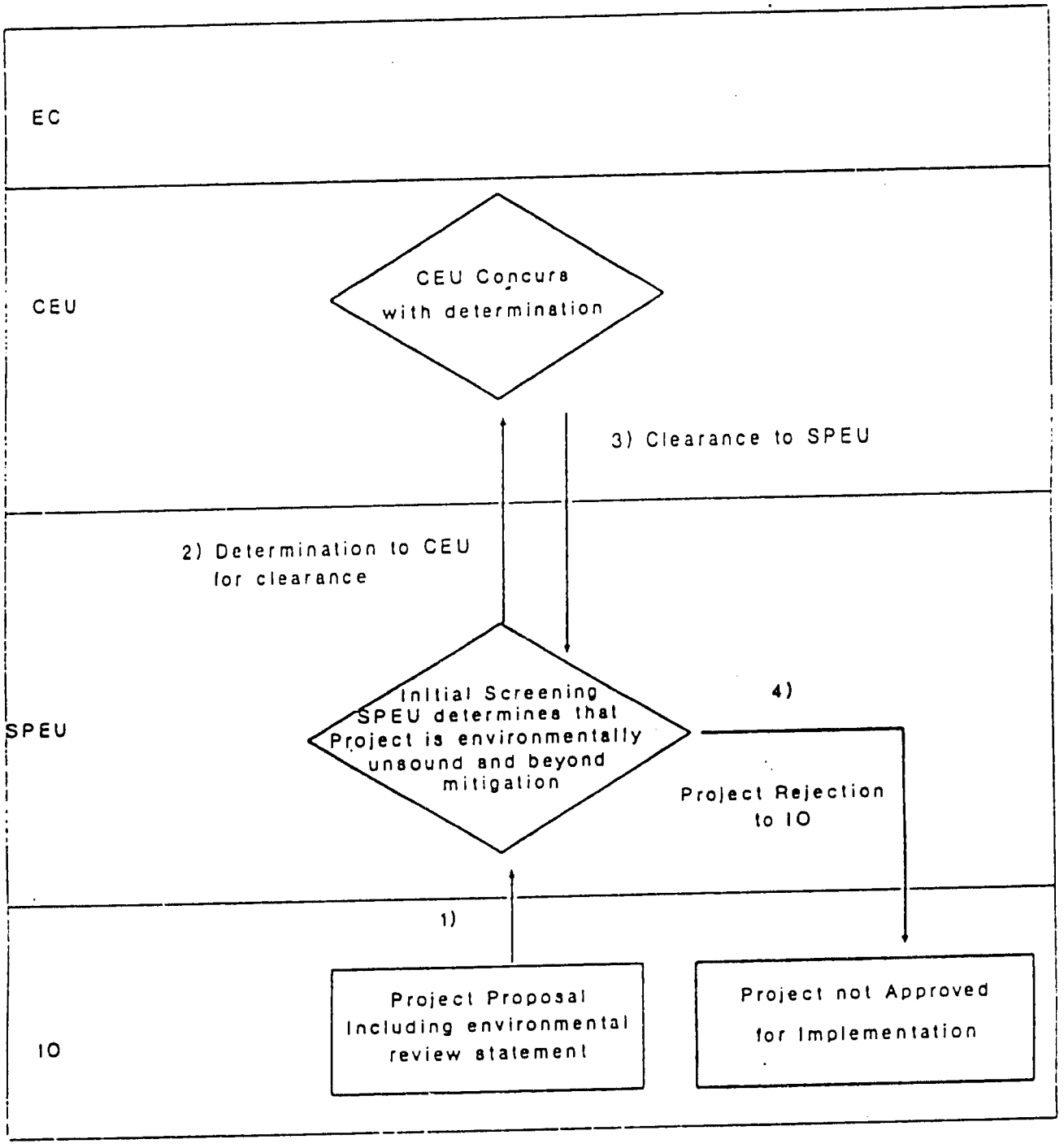


Level of Responsabilities

EC: External Consultants
CEU: Central Environmental Unit
SPEU: Special Project Environmental Unit
IO: Implementing Organizations

Figure 5. ENVIRONMENTAL EVALUATION PROCESS

Case 2: Project considered environmentally unsound and beyond mitigation.



Level of Responsabilities

EC: External Consultants

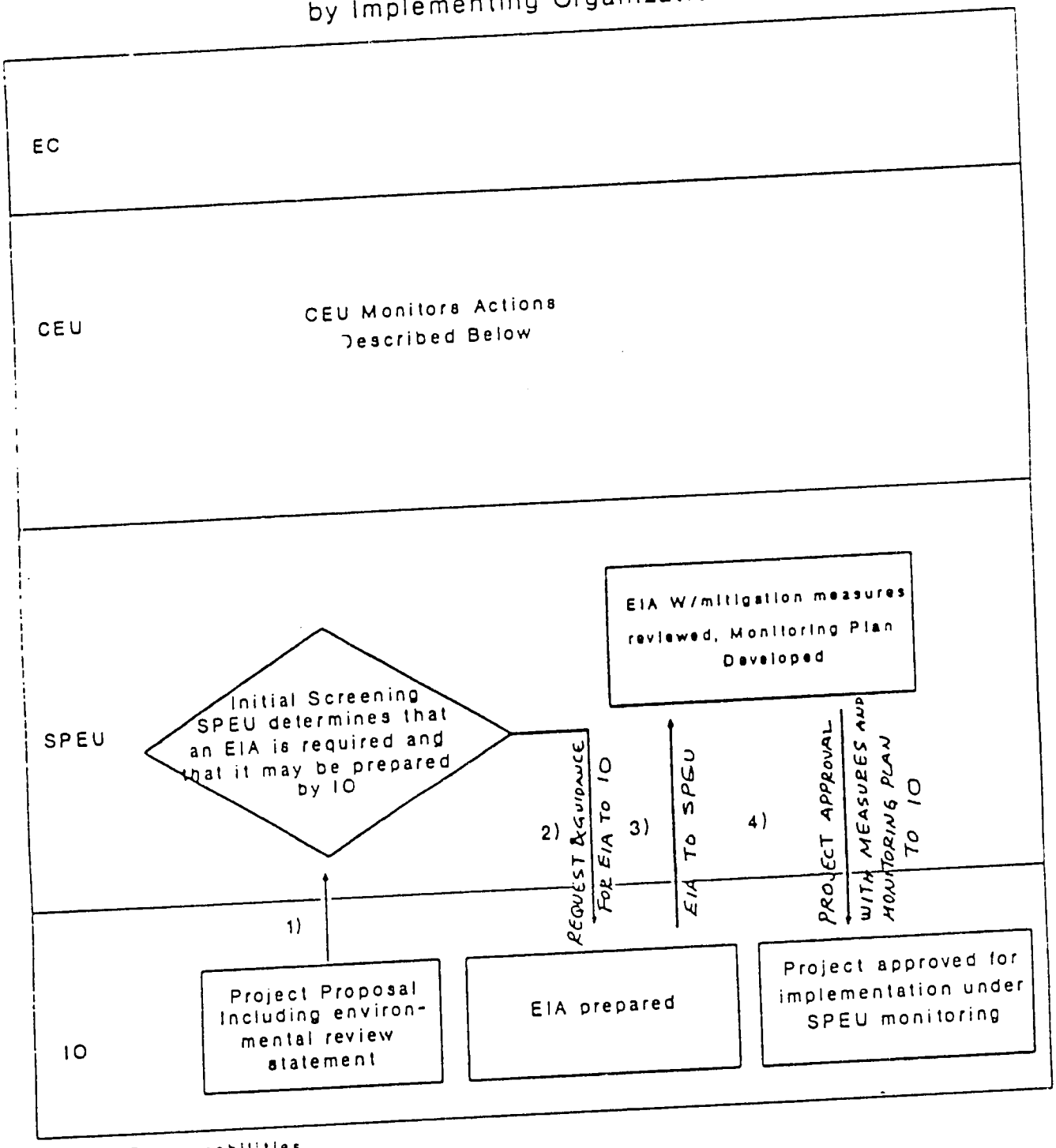
CEU: Central Environmental Unit

SPEU: Special Project Environmental Unit

IO: Implementing Organizations

Figure 6. ENVIRONMENTAL EVALUATION PROCESS

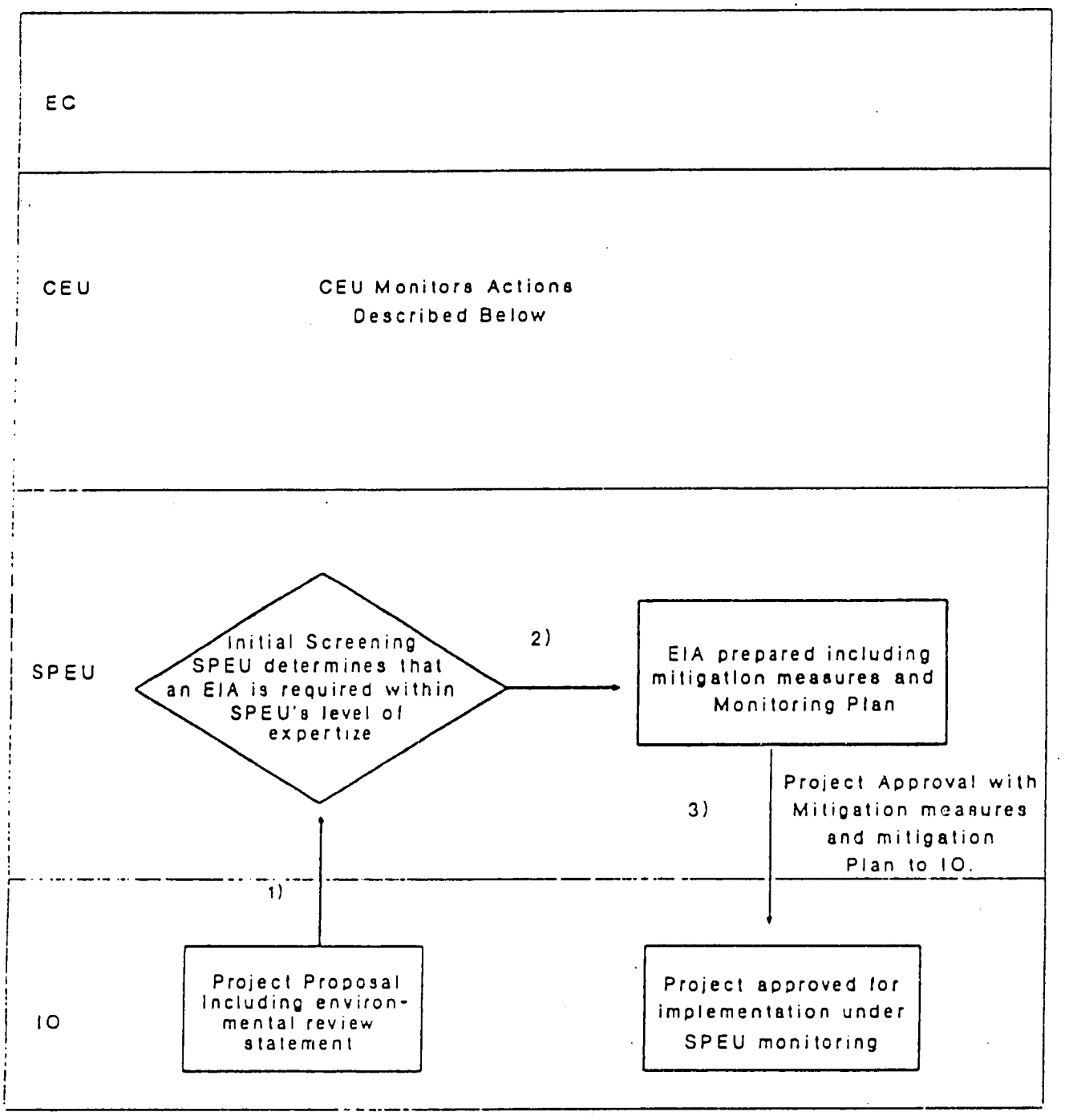
Case 3: Project requires EIA prepared by Implementing Organization



Level of Responsabilities

EC: External Consultants
CEU: Central Environmental Unit
SPEU: Special Project Environmental Unit
IO: Implementing Organizations

Case 4: Project requires EIA prepared by Special Project Environmental Unit



Level of Responsabilities

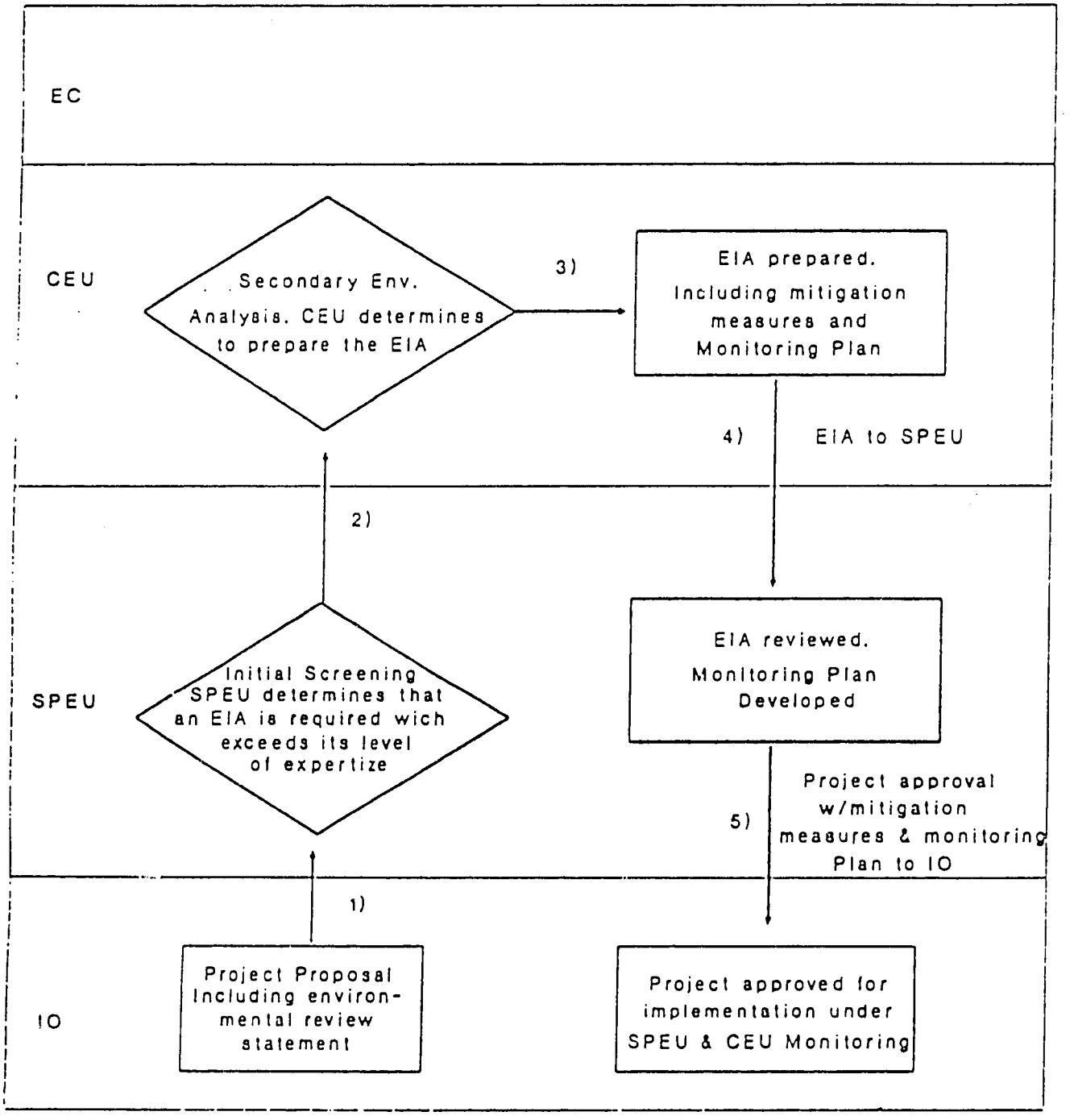
EC: External Consultants

CEU: Central Environmental Unit

SPEU: Special Project Environmental Unit

IO. Implementing Organizations

Case 5: Project requires EIA prepared by Central Environmental Unit



Level of Responsabilities

EC: External Consultants

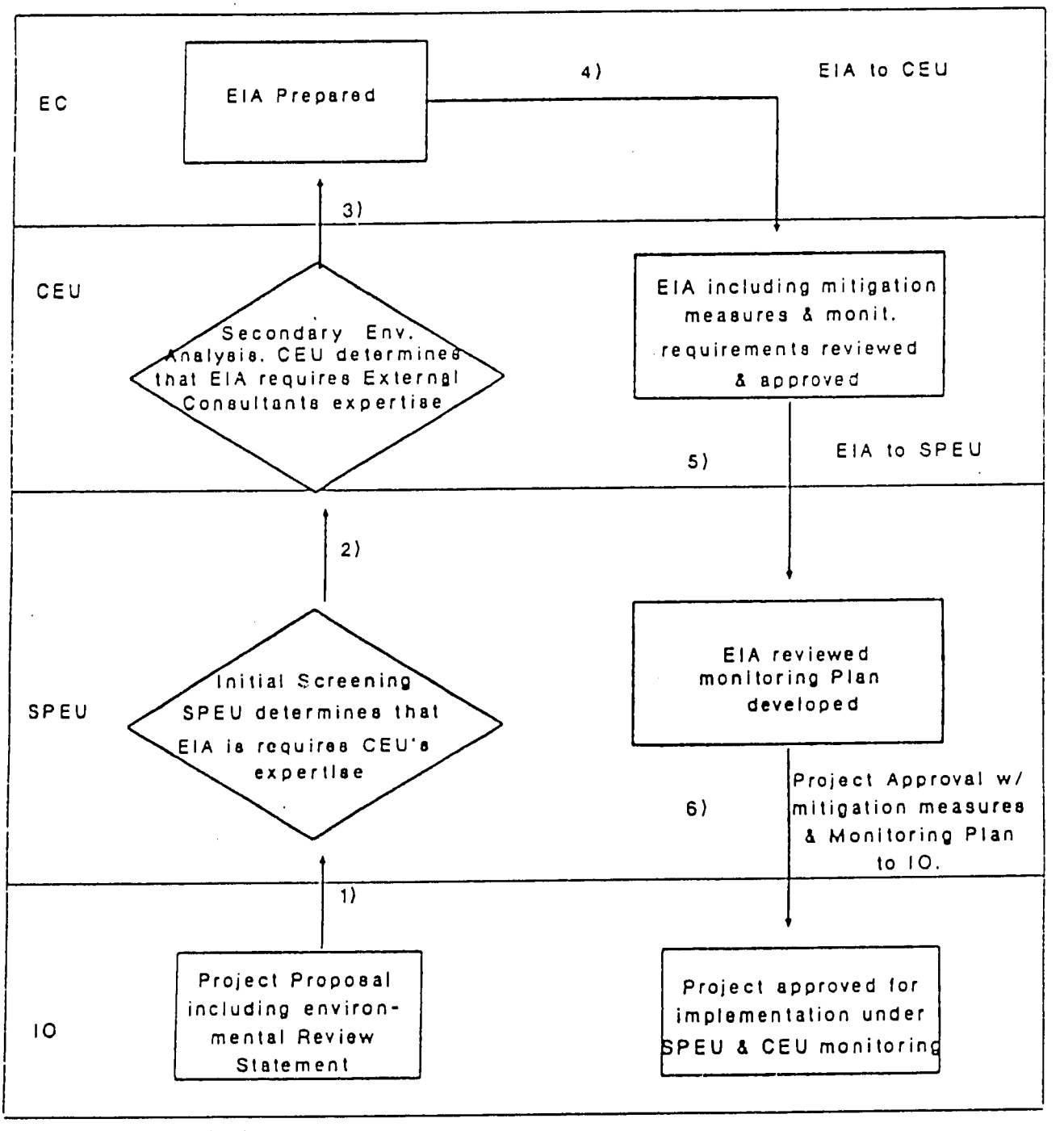
CEU: Central Environmental Unit

SPEU: Special Project Environmental Unit

IO: Implementing Organizations

Figure 9. ENVIRONMENTAL EVALUATION PROCESS

Case 6: Project requires EIA prepared by External Consultants



Level of Responsabilities

EC: External Consultants

CEU: Central Environmental Unit

SPEU: Special Project Environmental Unit

IO: Implementing Organizations

production and processing. Whenever necessary, the Project should be able to contract or enlist the collaboration of specialists to assist with the presentation of training sessions. An illustrative budget and additional suggestions for the training program are provided in Appendix I, section VI.

9.4 Farmers

At the farmer organization level, environmental awareness and mitigation training should be provided mainly through technical assistance and field days. Because the Project capacity for directly reaching large numbers of farmers will be limited, their training should be the responsibility of NGOs, municipal governments, farmer organizations, and other participating institutions, which in turn would have been trained by the Project staff. Thus, training should flow in a multiplicative fashion through all participating groups until as many farmers as possible have been reached at the end of the Project. The Project should also promote informational meetings that are attended by public sector institutions, NGOs, and other groups having programs or interest in sustainable agriculture and natural resources management.

10.0 Project Environmental Review Procedures

The Project environmental review process will be based on the procedures described in this section and summarized in the attached operational flowcharts. These procedures presuppose the existence of environmental review capabilities at the following three levels in the Project implementation operational structure: at the field level, i.e. in organizations implementing Project activities; at the INADE Special Project level; and at the CSD Project level. Environmental review checklists for crop production, irrigation, livestock production, road rehabilitation, small infrastructures, and forest management activities have been included in Appendix I, section III. Additional checklists may be developed by the CEU and Special Projects, as needed. These checklists are designed to assist the Project to determine the environmental soundness of proposed activities.

In order to ensure that the Project environmental program and review procedures are implemented in accordance with Project objectives and AID Environmental Procedures, the following implementation plan is proposed:

Year 1

- A Central Environmental Unit (CEU) is established as described in section 10.1 of this report. Concurrently, INADE assigns two counterpart staff to the CEU.

- Each collaborating INADE Special Project establishes an environmental unit (SPEU) of its own. These units are trained by the CEU in environmental impact assessment (EIA) and monitoring procedures during the early stages of Project

implementation, and thereafter collaborate closely with the CEU staff (see section 9.2).

- The CEU staff design an environmental training program and, in collaboration with SPEU staff, provide short-term training and technical assistance in environmental review and monitoring procedures and approaches to participating organizations. The training program is to be based on the current World Bank Environmental Assessment Sourcebook guidelines and Peruvian Environmental Code requirements.

- Potential participating NGOs, municipalities, and other interested organizations are informed that activity proposals submitted to the CSD Project for funding considerations should include a 3-5 page environmental review statement identifying potential adverse environmental impacts and describing how these will be prevented or mitigated. A sample format for this statement is provided in Appendix I, section V.

- During the first year of Project implementation, the CEU oversees and guides most of the Project environmental review process. During this first year, the CEU also begins sharing its environmental review responsibilities with the INADE counterpart environmental staff and with the Special Projects, as these establish their own environmental units and their staff are trained in EIA procedures.

Years 2-3

- Starting with the second year of Project implementation, the INADE Special Projects environmental units (SPEU) are fully active in the Project environmental review and monitoring process, and the CEU role shifts to one of mainly guidance and support in all aspects of Project environmental review activities. INADE counterpart environmental staff continue to work closely with the CEU in all relevant areas.

- By the end of the third year, the role of the Project supported CEU ends and INADE assumes full control of all Project environmental procedures and activities.

- CEU and SPEU staff provide guidance and technical assistance to interested groups in the preparation of environmental review statements required for the acceptance of activity proposals. Assistance may include visiting potential project sites and recommending mitigative actions for incorporation into the activity. Examples of mitigation actions include: planting in horizontal contour rows to minimize soil erosion for hillside agriculture activities, improving lateral

drainage systems when rehabilitating roads, and providing schools with suitable sanitary facilities.

The operational procedures that should guide the CSD Project environmental review process are summarized below:

- A SPEU receives an activity proposal and environmental review statement and examines it for environmental soundness. The activity then:

  a) Is approved without further analysis (when shown not to pose significant environmental risk or when proposed mitigative actions are considered to be adequate).

  b) Is required to undergo further analyses until all main environmental concerns are satisfied through the incorporation of appropriate mitigative actions. In most cases the SPEU, in consultation with the CEU, should be able to readily determine if an environmental analysis and proposed mitigative actions are appropriate. Whenever these are determined to be inadequate, the SPEU and CEU should then recommend appropriate corrective actions to the interested organization.

  c) Is rejected, when the activity is considered to be environmentally unsound and beyond mitigation.

- The activity proposal and environmental review statement along with the SPEU analysis and decision is next sent to the CEU for final approval. At that time, the CEU may concur or disagree with the SPEU decision and require additional information or obviate the need for further environmental analysis, as the case may be. It is anticipated that once a healthy and intensive collaborative interaction has been established between the Central and Special Project environmental units, the decisions made by SPEUs will invariably have CEU support and vice versa.

- When the CEU and SPEU have determined that a proposed activity needs further environmental analysis, they must also determine the nature and scope of such analysis and, in collaboration with the participating implementing organization, decide how it will be conducted and by whom. The following four levels of environmental assessment intervention are proposed, depending on the availability of required expertise, as dictated by the environmental issues to be addressed:

  a) The participating organization, with CEU or SPEU guidance and support, conducts the required environmental impact assessment (EIA). The level of

CEU or SPEU involvement will depend on the in-house or contracted EIA expertise of the implementing organization.

b) The SPEU conducts the EIA. This will occur mainly in cases where the implementing organization completely lacks environmental review capabilities. An alternative to this approach would be to use other local EIA capabilities (i.e. from universities, NGOs, and other groups) to provide the required assistance. It is envisioned that in most cases the SPEUs will provide the necessary guidance and technical assistance, while the responsibility for conducting the EIA will fall on the implementing institution.

c) The Central Environmental Unit will assist in the preparation of EIAs during the early stages of Project implementation. This role will diminish as the EIA capabilities of SPEUs, NGOs, and other implementing organizations is strengthened. The CEU will also assist in cases where it can contribute expertise not found in the SPEUs or collaborating implementing organization.

d) In special, and probably rare occasions, specialized outside expertise may be required to assist implementing organizations to conduct environmental impact assessments. This would apply to cases requiring specialized environmental expertise not found in the CEU, SPEUs, or implementing organizations. Examples of such issues could include the proposed introduction of exotic species, biotechnology applications, and novel crop production and protection practices.

- Although the CEU and SPEU staff will provide training, guidance, and assistance in environmental impact assessment and monitoring, the ultimate responsibility for preparing EIA statements for Project review should reside with beneficiary organizations. This will ensure that such organizations truly learn and become directly involved from the beginning in the application of Project environmental review procedures.

11.0 LIST OF PREPARERS

Angel A. Chiri, entomologist and PEE team leader. Recent experience includes implementation of integrated pest management (IPM) projects and application of environmental procedures to AID-supported agricultural projects in Latin American and Caribbean countries, with emphasis on food and export crops. Mr. Chiri has worked over 11.5 years as Pest Management Advisor for AID's Regional Office for Central America and AID/LAC's Environment Office in Washington. Mr. Chiri holds a Ph.D. degree in Entomology and Biological Control and M.A. and B.A. degrees in Biology.

Javier Anduaga, Forestry Engineer. Mr. Anduaga worked 15 years for Perú's National Office for Natural Resources Evaluation (ONERM), where he headed several units. He has also worked for Perú's Ministry of Agriculture, Office of Agricultural Planning. At present, he is a member of the Amazonia Association and a private consultant. Mr. Anduaga has a degree in Forestry from the Universidad Nacional Agraria, La Molina, Peru and an M.S. in Ecology and Ecosystems Management from the University of Chapingo, Mexico.

Raúl Gonzalez, Road and Infrastructure Engineer. Mr. Gonzalez has broad experience in water resources and highway engineering and has worked as advisor and consultant engineer for over 23 years. Mr. Gonzalez has a degree in Civil Engineering from the Universidad Nacional de Ingenieria, Lima, Perú.

Tommy E. Fairlie, Soil Scientist and Agricultural Development Specialist. Mr. Fairlie has worked in rural community development since 1988. His recent experience includes the study of low input agricultural production systems and their relationship with natural resources management in the Andes. Recently, he has been involved in organizing a potato seed production system for low-income farmers. Mr. Fairlie holds a Ph.D. degree in Soil Science and Crop Production, and M.S. and B.S. degrees in Agronomy.

Luis Román has expertise in environmental and natural resources management and in promoting the participation of indigenous groups in development planning. As adviser to the Netherlands Embassy in Perú, Mr. Román has been involved in the planning and evaluation of numerous projects, most of which have include environmental components. Mr Roman is also experienced in issues involving socio-economic development, including micro-enterprises and women in development. Mr. Román holds an M.A. degree in Anthropology.

Appendix I. Background Document for the Programmatic Environmental Evaluation for the Counternarcotics Sustainable Development Project

Appendix II. Scope of Work for the Programmatic Environmental Evaluation of the Counternarcotics Sustainable Development Project

SECTION C - STATEMENT OF WORK

I. Purpose

To analyze potential environmental impacts of the proposed CSD Project activities and develop generic assessments, environmental standards, guidelines and mitigation measures for those Project activities which may have significant environmental effects, such as construction or improvement of roads, bridges, power grids, irrigation systems, potable water systems, health centers, reforestation, and off-farm enterprises. A full description will be given of the data and analytical basis for these guidelines and recommendations. The Programmatic Environmental Evaluation (PEE) will follow the requirements given in the Foreign Assistance Act (FAA) and its Amendments, and A.I.D. Regulation 22 CFR Part 216.

The environmental specialist (Team Leader) to be contracted for these services will lead a team of four Peruvian specialists, to be contracted separately, with combined expertise in the following areas: tropical ecology, environmental engineering/physical geography, rural sociology and planning, natural resources management, land use policy and planning, road/infrastructure construction, pest management, forestry and flora and fauna species. The Team Leader, with the support of the local team, will be responsible for preparing the assessments, standards, guidelines, mitigation measures and training plans described in this Scope of Work.

II. CSD Project Description

The Project goal is to promote sustainable development in coca growing areas and in adjacent economically depressed departments, which will promote economic growth and replace coca based employment and production activities with licit alternatives. Coca production in the Project target area has led to indiscriminate clearing of tropical forest lands and widespread environmental contamination with chemicals used in coca cultivation and processing. The purpose of the CSD Project is to increase and diversify the number of viable income producing opportunities for residents of selected "cuencas" of the Huallaga Valley, Apurimac River Valley, Pichis-Palcazu Valley, Aguaytia River valley and adjoining areas who are dependent on coca production and processing as their main source of income

The five year project will be implemented in selected sites from the following possible departments: Ayacucho, Apurimac, San Martin, Ucayali, Huanuco, Pasco, Junin, Amazonas, Loreto, Cuzco and Huancavelica. The Project will be implemented through a bilateral agreement between the GOP and USAID/Peru. The GOP unit responsible for implementation will be INADE, with various public and private institutions implementing various sub-activities through agreements with INADE.

The Project will have four components:

(a) Small scale, community based projects implemented through municipal government structures in areas where local government institutions have been debilitated by government neglect and terrorist violence.

(b) Integrated economic and social development activities in exchange for a scheduled reduction of coca leaf production in targeted cuencas. Sub-activities will include construction of physical and social infrastructure such as roads, bridges, irrigation systems, classrooms, health facilities and potable water sources. It will also include the promotion of local organizations. Production and processing facilities will be established and technical assistance provided on an as needed basis.

(c) Credit and marketing assistance. This will take the form of technical assistance and grants to viable private credit institutions to be used as seed money for micro-enterprise and small farmer lending programs. Identification of potential markets and product preparation for potential markets are key elements for this component.

(d) Environmental protection and awareness. This will concentrate on protecting those areas removed from coca cultivation and will promote information on the environmental damage caused by illicit crop production and processing.

III. Background Information and General Guidelines

A.I.D. projects have been active in the Huallaga Valley and associated communities for over a decade. Prior assessments and other information are available from the documents of the Upper Huallaga Area Development Project, including specific information available from the 1991 Environmental Assessment of the proposed Selva-Coastal Road Rehabilitation Project. Documents, maps, photography and other information from these sources will include much of the basic geographic, topologic and biologic data needed for this PEE in terms of road rehabilitation, soil types and properties, original forest cover, land use capacity, etc., but will not include sufficient information for assessment of activities involving power grids, irrigation systems, potable water systems, health centers, reforestation, changes in agricultural production systems, and the establishment of off-farm enterprises.

In 1992, USAID designed an alternative development project which was not implemented because of political reasons. The Selva Economic Revitalization (SER) Project design is basically the same design as the CSD Project but in a more reduced geographical area. The LAC Bureau Recommended Threshold Decision for the SER Project was a Positive Determination for those activities included in the Strategic Infrastructure, Private Sector Investment Support and Campesino Collaboration Community Development project components, with potential impacts on the environment. A Categorical Exclusion was requested for the Training, Institution Building, Technical Studies, and Technical Assistance components.

Since specific CSD Project activities have not yet been identified, USAID/Peru, based on the SER experience, has decided to proceed directly with an environmental analysis for the Project. Under this study, generic assessments will be developed for those types of Project activities which are likely to produce environmental impacts. The potential environmental impact of these activities will be examined and guidelines, recommendations and mitigation

will be provided for the design and implementation stages. Measures will also be defined to establish accountability and responsibility for ensuring that proper environmemntal procedures are implemented. Activities which have potentially significant impacts on the environment include construction, changes in agricultural production systems, reforestation, and most other field-oriented activities, as well as off-farm enterprises involving manufacturing, food processing, or other possible sources of significant pollution or other direct environmental impacts.

The "generic" assessments developed under this PEE will be followed during subsequent design of those structures such as bridges, classrooms, etc. Some activities, such as road repair or renovation, require assessments which deal with homogeneous terrain; an example is a series of similar class roads in an area of uniform soil and slope where the anticipated impacts will be similar. In those cases, it may be possible to prepare geographically restricted assessments for parts of the Project area, without new assessments needed for future road activities in the geographically restricted area. Assessments must comply with the following (and related) U.S. Laws and Regulations when preparing such generic assessments. For example, any road or livestock activities in national parks or other conservation units, or within "relatively undegraded forest lands", have specifically-mandated restrictions (see Section B below, Tropical Forests {Sec. 118, FAA}) which must be emphasized in this PEE.

Applicable A.I.D. Environmental Regulations and U.S. Laws

The Project region includes medium-altitude mountain passes and slopes, tropical rain forests, and valley bottoms in cultivation, in the Huallaga, Aguaytia, Alto Mayo, Apurimac and Pichis-Palcazu valleys and surrounding areas. These are areas of tropical montane, premontane, and moist lowland forests (sensu Holdridge) with high species diversity and limited capacity to support agriculture on the slopes along the valley sides, but with considerable agricultural production on the valley floors. Most of the forested areas with relatively fertile soils have been converted to agriculture in the last thirty years. The moderate to steep slopes, not generally suitable for agriculture, largely have been converted from forests to coca production fields in the last decade.

The Foreign Assistance Act (FAA) and A.I.D. Environmental Procedures (22 CFR Part 216) require that A.I.D. "*Ensure that the environmental consequences of A.I.D.-financed activities are identified and considered by A.I.D. and the host country prior to a final decision to proceed and that appropriate environmental safeguards are adopted.*"

The December, 1986 amendments of Sections 117, 118 and 119 of the FAA include congressional mandates to A.I.D. for protection of Environment and Natural Resources, Tropical Forests, and Biological Diversity, respectively. The team preparing this PEE must be cognizant of, and base their recommendations on, these and other applicable sections of the FAA, and on A.I.D. regulations and policy statements regarding the environment and the sustainable use of natural resources. Portions of the 1986 Amendments which will, or may, apply to A.I.D.-supported activities are cited below.

A. Environment and Natural Resources (Sec. 117, FAA)

"(a) The Congress finds that if current trends in the degradation of natural resources in developing countries continue, they will severely undermine the best efforts to meet basic human needs, to achieve sustained economic growth, and to prevent international tension and conflict... It is, therefore, in the economic and security interests of the United States to provide leadership both in thoroughly reassessing policies relating to natural resources and the environment, and in cooperating extensively with developing countries in order to achieve environmentally sound development."

B. Tropical Forests (Sec. 118, FAA)

Construction, rehabilitation or upgrading of roads, and other activities resulting in conversion of forest lands to pastures or other reduction of native forest species, colonization, or water management construction require EAs. A.I.D. must give these considerations high priority in developing and implementing programs in developing countries, and include them in all bilateral and multilateral assistance. The most relevant paragraphs are the following:

"(a) IMPORTANCE OF FORESTS AND TREE COVER.-- In enacting section 103(b)(3) of this Act the Congress recognized the importance of forests and tree cover to developing countries. The Congress is particularly concerned about the continuing and accelerating alteration, destruction, and loss of tropical forests in developing countries, which pose a serious threat to development and the environment. . . ."

"(b) PRIORITIES.-- The concerns expressed in subsection (a) and the recommendations of the United States Interagency Task Force on Tropical Forests shall be given high priority by the President--

(1) in formulating and carrying out programs and policies with respect to developing countries, including those relating to bilateral and multilateral assistance and those relating to private sector activities; and

(2) in seeking opportunities to coordinate public and private development and investment activities which affect forests in developing countries."

"(c) ASSISTANCE TO DEVELOPING COUNTRIES.-- In providing assistance to developing countries, the President shall do the following:

(1) Place a high priority on conservation and sustainable management of tropical forests. . . .

(5) To the fullest extent feasible, help end destructive slash-and-burn agriculture by supporting stable and productive farming practices in areas already cleared or degraded and on lands which inevitably will be settled, with special emphasis on demonstrating the feasibility of agroforestry and other techniques which use technologies and methods suited to the local environment and traditional ...

agricultural techniques and feature close consultation with and involvement of local people. . . .

(11) To the fullest extent feasible, engage in efforts to increase the awareness of United States Government agencies and other donors, both bilateral and multilateral, of the immediate and long-term value of tropical forests. . . .

(13) Require that any program or project under this chapter significantly affecting tropical forests (including projects involving the planting of exotic plant species)--

(A) *be based upon careful analysis of the alternatives available to achieve the best sustainable use of the land, and* (B) *take full account of the environmental impacts of the proposed activities on biological diversity, as provided for in the environmental procedures of the Agency for International Development.*

(14) Deny assistance under this chapter for-- . . .

(B) actions which significantly degrade national parks or similar protected areas which contain tropical forests or introduce exotic plants or animals into such areas.

(15) Deny assistance under this chapter for the following activities unless an environmental assessment indicates that the proposed activity will contribute significantly and directly to improving the livelihood of the rural poor and will be conducted in an environmentally sound manner which supports sustainable development:

(A) *Activities which would result in the conversion of forest lands to the rearing of livestock;*

(B) *The construction, upgrading or maintenance of roads (including temporary haul roads for logging or other extractive industries) which pass through relatively undegraded forest lands;*

(C) *The colonization of forest lands;*

(D) *The construction of dams or other water control substances* [sic, 'structures'] *which flood relatively undegraded forest lands."*

Proposed road completions and improvements may concern "15.B," and secondarily may include "15.A" and "15.C," since increased colonization and pasture formation may occur in some areas as a result of completion or improvements of roads. The above FAA amendments recognize these probable consequences and require rather extensive assessment, planning, review and approval before A.I.D. funds can be obligated or used.

Thus, any new road construction or upgrading and subsequent maintenance, including logging or other feeder roads, using Project funds or support, including use of Project vehicles or personnel, will require Environmental Review and Amended Environmental Assessment of the road design (including maintenance) and its
potential impact, requiring approval of the LAC Bureau Environmental Officer before funds or other Project support can be obligated.

Continuing maintenance activities on existing roads (e.g. grading, ditch cleaning, general repair, etc.) will be periodically reviewed by the Regional Environmental Advisor (REA/SA), the USAID/Peru Mission Environmental Officer, or other specialist(s) designated by the LAC Bureau Environmental Officer, to ensure environmentally sound procedures are being followed. Specific EAs of these maintenance activities will not be required, although this PEE should offer guidance for such maintenance activities where these could have significant impacts, or contribute to the longer-term degradation of other areas.

C. Endangered Species (Sec. 118, FAA)

"(b) In order to preserve biological diversity, the President is authorized to furnish assistance under this part to assist countries in protecting and maintaining wildlife habitats and in developing sound wildlife management and plant conservation programs. Special efforts should be made to establish and maintain wildlife sanctuaries, reserves, and parks; to enact and enforce anti-poaching measures; and to identify, study, and catalog animal and plant species, especially in tropical environments. . . ."

"(g) ACTIONS BY A.I.D.- The Administrator of the Agency for International Development shall-- . . ."

> *"(3) engage in dialogues and exchanges of information with recipient countries which stress the importance of conserving biological diversity for the long-term economic benefit of those countries and which identify and focus on policies of these countries which directly or indirectly contribute to loss of biological diversity; . . ."*
>
> *"(5) whenever possible, enter into long-term agreements in which the recipient country agrees to protect ecosystems or other wildlife habitats recommended for protection by relevant governmental or nongovernmental organizations or as a result of activities undertaken pursuant to paragraph (6), and the United States agrees to provide, subject to obtaining the necessary appropriations, additional assistance necessary for the establishment and maintenance of such protected areas;"*
>
> *"(6) support, as necessary and in cooperation with the appropriate governmental and nongovernmental organizations, efforts to identify and survey ecosystems in recipient countries worthy of protection . . . ."*

This scope of work is intended to serve as a general framework to guide assessment of Project activities, during (and as part of) design of these activities, but before implementation begins. Some of the information recommended to be included may not be available for the specific areas of future activities, but the inclusion or exclusion of categories of information will depend on the specific environmental conditions and the activities actually planned; details of the work required can be determined in each case by preliminary studies, in consultation with the REA and MEO, and other Mission personnel.

Recommendations, and concurrence with the PEE recommendations, can be given by the REA/SA and the USAID/MEO, but formal approval of EAs must be given specifically (as required in the FAA and A.I.D. Regulation 22 CFR Part 216) by the A.I.D./LAC Bureau Environmental Officer before activities which are not categorically exempted can begin.

IV. Scope of Work

Some of the proposed CSD Project activities will have the potential to cause adverse environmental impacts. The PEE Team will review proposed Project activities, identify the types of activities which are likely to cause environmental impacts, conduct field investigations of potential types of interventions in proposed Project areas, develop generic environmental assessments for those interventions, develop sets of generic guidelines or assessment tools focussing on the broad issues that may occur in proposed development regions, propose appropriate mitigation measures to eliminate or reduce possible impacts, assess capability of implementing agencies to conduct environmental assessment and monitoring and propose technical assistance and training programs to strenghten their capabilities. The generic guidelines developed by the PEE team will be used by the implementing agencies to conduct site-specific assessments during the Project implementation stage. Their use at the pre-feasibility stage is intended to reach a threshold determination to proceed with or to drop proposed Project actions.

Some of the key issues related to the Project activities which have the potential to cause adverse enviornmental impacts are listed below:

1. Major road construction, access and feeder roads (including bridges) and maintenance activities. The potential impacts of road-grading and bridge-building on erosion and water quality should be examined and measures to minimize those impacts included. The potential impact of borrow-pits and the procurement of any other local material for road surfacing, such as gravel, should be examined.

Road building projects in Peru generally lead to unsustainable extraction of valuable forest species (particularly caoba, *Swietenia* sp.), deforestation, reduction of biodiversity, and unplanned and uncontrolled colonization. The PEE team, in addition to developing mitigation measures for potential impacts of road-building on erosion, sedimentation of streams and waterways, blockage or modification of stream flows, and water quality, must place strong emphasis on the social and environmental impacts of the road building activities, and the influence these will have on biodiversity and forest conversion. The PEE must thoroughly examine the potential negative environmental and social effects of opening new roads or

reconditioning existing ones (e.g., uncontrolled colonization and deforestation) and it should propose a broad and innovative mitigation and monitoring plan to counter the potential for irreversible environmental damage. Among the topics that the PEE team must pay particular attention is on how to design an effective mitigation plan which does not result in lowering the transaction costs for illegal loggers and poachers, and make their criminal trade easier and more profitable.

No complete biological inventory of the Project areas exists, although biological inventories from Rio Abiseo National Park indicate that it is high in endemic mammalian species (M. Leo [APECO] 1992a, 1992b, and pers. comm.). Preliminary surveys by Dr. John O'Neill of Louisiana State University and others indicate that the Rio Biabo drainage and the Cordillera Sur are important areas for bird diversity and endemism. The PEE team will examine the impact of road building and renovation activities on the killing or capture of wildlife for trade or subsistence.

The PEE team shall develop mitigation guidelines for the implementation stage. These will take into account: 1) land-use capability; 2) effective protection of lands best suited to forest cover and/or important to the conservation of biodiversity; 3) preservation of uplands essential to watershed protection; and 4) possible colonization and titling of lands before actual road-building. Any areas which comprise critical habitat for endangered species should be designated as such, and workable and effective plans for their conservation should be included in mitigation measures.

2. Recovery of agriculture: The CSD Project will promote the production of traditional food crops (rice, corn, yucca, cotton, beans, bananas) and non-traditional crops, such as tropical fruits, palm oil, palm hearts, lemon grass, macadamia nuts, spices, medicinal plants, and mulberry trees for silk worm cultivation. Agricultural promotion, even if restricted to those areas formerly or currently under cultivation, could result in long-term loss of soil fertility due to compaction and contamination with agro-chemicals.

Non-traditional agricultural crops, particularly those introduced in tropical and subtropical areas often encounter new and unforeseen pest problems, which in turn lead to severe pest losses and increased reliance on pesticide use. Often, rates of pesticide applications escalate dramatically as target pests develop resistance and new pests emerge as their natural enemies (predators, parasitoids, and pathogens that normally keep pest organisms in check) are decimated. When appropriately applied, i.e. within the context of an integrated pest management approach, pesticides can be an effective pest management tool. However, if crop production becomes overly dependent on chemical control, the potential economic benefits derived from the prevention or reduction of pest damage (yield and/or quality loss) can be offset by pest control costs. Excessive pesticide dependency can render an unprofitable agro-industry within a few seasons.

The promotion of monocultures and the introduction of irrigation often aggravate pest and pesticide problems by providing a vast and continuous food supply in time and space to actual or potential agricultural pests. If irrigation is used to grow crops during the dry season, the natural discontinuity that limits pest population growth each year is eliminated. That is,

crops grown during the dry season can function as a corridor through time, providing a continuous food supply and a breeding medium for certain pest organisms throughout the year, with little disruption.

Less obvious, but nonetheless highly significant, are the hidden costs (externalities) associated with pesticide-related health problems and environmental contamination. Intense pesticide use (through drift, leaching, transport in runoff water, improper washing of application equipment in streams, inappropriate mixing and loading operations, improper disposal of pesticides and containers, illicit use of banned or severely restricted pesticides, mainly highly toxic or non-biodegradable products, and accidental pesticide spills) can lead to severe and lasting environmental contamination. The intoxication of nontarget organisms, including humans, is an expected consequence. Farmers, field workers, pesticide applicators and their families, and the general rural population are at greater risk of acute pesticide poisoning. Consumers of fresh or processed commodities having pesticide residue levels that exceed EPA or WHO/FAO established tolerances face the risk of developing chronic, long term intoxication effects.

The PEE team must also examine and recommend mitigations for the impact of indiscriminate disposal in streams and rivers of toxic chemicals associated with coca processing.

3. Recovery of livestock production: impact on native vegetation. One of the planned objectives of the project is to increase present cattle production in an attempt to recover some project areas historic levels. Considering the almost universally destructive effect cattle have had in tropical regions, the PEE team shall examine the impacts of historic cattle production levels and this proposed increase for recovery on the following: forest cover and conversion, carrying capacity of land (effects on vegetative cover, species composition, soil compaction, and erosion), and contamination of areas with fecal matter. Also, the relative efficiency of protein production with cattle as compared to other types of livestock, such as swine, poultry, or microlivestock, such as cuy (guinea pig), should be examined.

4. Introduction of exotic species, such as Tilapia fish, shrimp: potential impact on native fauna. Dr. Hernán Ortega, ichthyologist and head of the Museo de Historia Natural Javier Prado in Lima, states that in relation to the rest of the native fish fauna of the Amazon, *Tilapia* is a poor competitor. In the event of its accidental release or escape into Amazonian waterways, there are other highly piscivorous native species, e.g. *Hoplias malabaricus*, that will tend to keep it from becoming well-established. In addition, *Tilapia* requires still water in which to breed and raise its young, so it would tend not to become established in running water. Nonetheless, on the 10th of October, 1991, the Supreme Decree No. 0002-91 was issued which prohibits the seeding or cultivation of any of the various species of *Tilapia* in the entire drainage of the Amazon River. The PEE team must examine the impact of potential escape or accidental release of non-native fish or crustacean species on the native fauna and the broader implications for riverine ecosystems. It should be noted that both Venezuela and Brazil have done research into the cultivation in captivity of several commercial Amazonian fish species, and that it would be preferable to encourage aquaculture with these species rather than introduced species.

5. Improvement and extension of irrigation systems: long term effects on soil fertility and salinization, as well as disruption of natural water flows in streams and rivers. The PEE team will examine the anticipated effects of irrigation systems and water diversions on the natural hydrological flows of rivers and streams, and species which may be affected by a change in those regimes. They will also examine the long-term effects of irrigation on soil fertility and salinization of croplands, as well as potential increases in diseases affecting humans, such as malaria and schistosomiasis.

6. Ongoing and planned reforestation activities: program suitability and selection of tree species. There is a fairly extensive and growing body of knowledge evaluating the suitability of various native tree species for reforestation purposes. It is not possible at this time to evaluate potential positive or negative impacts of any particular species. The PEE team should develop guidelines for ensuring that any reforestation will not involve the elimination of primary forest or advanced second growth for the establishment of plantation forestry, and that the species selected represent an ecologically sound and economically rational choice.

7. Management of tropical forests: Despite the importance of forest resource and forest cover in this region, and the very serious problems occurring as a result of deforestation, this Project does not include a strong forestry component. It is estimated that only in the Department of San Martin, deforestation takes place at the rate of 200,000 ha/yr, as a result of the spread of coca cultivation and a high growth/migration rate, estimated at between 3.5 and 4.5 % annually. The PEE will include a strategy for the creation of a forestry support activity for incorporation to the CSD Project.

8. Small scale community level road bridge repair and maintenance, irrigation, nurseries, potable water and sanitation, and minor infrastructure repair and construction: Numerous such interventions will be identified and implemented during the life of the CSD Project. The PEE team must provide generic environmental review and mitigation guidelines for use by the Project's environmental staff when reviewing and approving proposals and plans for the implementation of such activities, on a case by case basis. The PEE team should ensure that the CSD Project has built-in capabilities for effectively addressing future environmental concerns associated with such activities.

9. Upper Huallaga Area Development (UHAD) Project: The primary environmental impact and mitigation issues associated with the UHAD Project are fairly similar to those identified for the CSD Project. The information, analysis, and recommendations provided by environmental reviews developed for the UHAD project, and the preparation of a report on the degree and success of adoption of mitigative actions recommended, will provide valuable and insightful information to the CSD Project PEE. The PEE team will rely heavily on the experience and lessons learned associated with 10 years of A.I.D.-supported activities in the Huallaga Valley.

This will require that, previous to preparing the CSD Project PEE, an evaluation and report be made of activities implemented under the UHAD Project which respond to mitigative recommendations provided by the respective environmental reviews.

V. Overall Team Composition and Expertise

The PEE team will consist of the U.S. Team Leader and a local team of four (4) Peruvian specialists, to be contracted separately. The Team Leader will have experience in the coordination, preparation and writing of Environmental Assessments for A.I.D. projects. The four Peruvian specialists will have combined expertise in the following areas: tropical ecology, environmental engineering/physical geography, rural sociology and planning, natural resources management and land use policy and planning,road/infrastructure construction, pest management, forestry, fauna and flora species. The Peruvian specialists will have a good working knowledge of the English language.

A. Individual qualifications and expertise:

Team Leader/General Ecologist: a) strong professional background (Ph.D. or equivalent) in one of the areas for which expertise is required, with a minimum of ten years of experience; b) in-depth familiarity with USAID Environmental Procedures (22 CFR Part 216) and pertinent sections of the Foreign Assistance Act (FAA) that address environmental issues; c) expertise in the coordination, preparation, and writing of Environmental Assessments for USAID projects.

Peruvian Professional Team

1. Agricultural Development Specialist: a) strong professional background (Ph.D. or equivalent) with a minimum of ten years of experience in the field; b) familiarity with environmental aspects of agricultural development; c) familiarity with agriculture and livestock production in the Project areas; d) experience on soil conservation; e) familiarity with pesticides and pesticides practices in Peru and with A.I.D.'s pesticides procedures; f) experience on the development of Environmental Assessments for A.I.D.

2. Road/Infrastructure Engineer: a) strong professional background (at least M.S. level) with a minimum of ten years of experience in the field and preferably a Peruvian national; b) familiarity with the physical geography and conditions in Peru; c) experience in hydrology and watershed management; d) familiarity with environmental implications of road construction and other infrastructure works; e) proved experience on development of environmental assessments for infrastructure construction projects.

3. Forestry and Tropical Ecology Specialist: a) strong professional background (at least M.S. level) with a minimum of eight years of experience in forestry and tropical ecology; b) familiarity with logging and forestry practices and commercial species in the Upper Amazon area; c) familiarity with fauna and flora of the Project areas, rare/threatened/endangered species found there, and economic uses of forest plants.

4. Rural Sociologist/Planning Specialist: a) strong professional background (at least M.S. level) in rural sociology with a minimum of eight years of experience in the field; b) expertise in natural resource management and land use policy/planning; c) familiarity with socio-economic features of the proposed Project areas.

B. Team tasks and responsibilities:

The Team Leader and the local team will:

1. Review and become familiar with the following documents:

Selva Economic Revitalization Project Paper.

Upper Huallaga Area Development Project Paper and its 1993 Amendment. C. Peñaherrera del Aguila. 1985.

Estudio Ambiental del Area del Proyecto Especial Alto Huallaga.

Environmental Assessment of the Upper Huallaga Area Development Project. J. C. Dickinson, Team Leader. 1981.

Environmental Assessment of the Coastal-Selva Road Rehabilitation Activity. USAID PDC 5517-1-00-0105-00. D.O. No. 6. C.E. Russell, Team Leader. 1991.

Problemática de los Bosques Montanos del Noreste: Pre-Diagnóstico (APECO, Feb. 1992).

This Scope of Work and attached IEEs.

Any other literature made available by the Mission.

Additional references which may prove useful:

Leo, Mariella. 1992a. Problemática del Parque Nacional Río Abiseo, Amazonía Peruana. Tomo XI, No. 21, p.109-144.

--- and Mónica Romo. 1992b. Distribución Altitudinal de Roedores Sigmodontinos (Cricetidae) en el Parque Nacional Río Abiseo, San Martín, Perú. Memorias del Museo de Historia Natural Javier Prado, UNMSM (Lima). 21:105-118.

2. Conduct a Programmatic Environmental Evaluation (PEE) of the CSD Project according to the guidelines provided in 22 CFR Part 216 and this scope of work, including assessing the potential consequences of the "no Project/activity" alternative, i.e. continued expansion of coca production and associated deforestation, indiscriminate dumping

of chemicals used in coca processing, and associated health risks, including violence, to local populations.

3. Conduct field investigations of potential types of interventions in proposed Project areas and develop generic environmental assessments for those interventions, as well as generic environmental guidelines and appropriate mitigation measures.

4. Assess the capability of Project implementing agencies to conduct environmental assessments and monitoring and develop a technical assistance and training program to strengthen their capabilities.

5. Address stated key issues and follow directions and tasks indicated in this scope of work which may not be restated under Individual Team Member Tasks and Responsibilities below.

6. Work in close collaboration with USAID's Local Government and Sustainable Development Division in the Office of Rural Development, the USAID Mission Environmental Officer, staff of the several INADE's Special Projects, and other entities suggested by Mission personnel.

C. Individual team member tasks and responsibilities:

1. The General Ecologist/Team Leader will:

a. Coordinate PEE activities and provide leadership, guidance and support to the PEE team members in all aspects of PEE development.

b. Draw upon A.I.D./W's library and other U.S. and international sources to search for generic guidelines that exist for use in other countries.

c. Serve as the PEE specialist in the area of his/her expertise and work closely with all team members in addressing tasks requiring his/her guidance and advise.

d. Be responsible for preparing the draft PEE document, in accordance with A.I.D. Environmental Procedures, and for presenting USAID/Peru a finalized PEE document upon completion of assignment.

e. Work closely with the USAID/Peru Mission Environmental Officer, USAID/ORD/LGSD staff and the leader of the team responsible for the preparation of the CSD's Project Paper, as

appropriate, and conduct a briefing and debriefing session at the initiation and termination of the assessment, respectively.

f. Be responsible for additional PEE assignments as proposed by the Mission Environmental Officer, and other Mission personnel.

2. The Agricultural Development Specialist will:

a. Assess the impact of coca cultivation and processing and cutivation of traditional crops (yuca, cotton, rice corn etc.) on soils, and agriculture and recommend actions for protection and rehabilitation.

b. Determine the impact of changes in crops and agricultural production systems.

c. Recommend soil conservation practices for each Project intervention.

d. Assess the long term effects of new or improved irrigation systems on soil fertility and salinization.

e. Assess the impact of increases of livestock production on native vegetation.

f. Assess pest problems and pest management practices (including pesticides used) and needs for potential crops targeted for support.

g. Assess CSD Project capabilities in pest and pesticide management, including personnel considerations and training needs.

h. Design a pest/pesticide management training strategy for the Project.

i. Be responsible for additional PEE assignments as proposed by the team leader, the Mission Environmental Officer, and other Mission personnel.

3. The Road/Infrastructure Engineer will:

a. Gather and summarize descriptive geographic information on the Project areas. Summarize
information on topography, soils and hydrology.

b. Gather information on the environmental impact of similar road construction/rehabilitation and other infrastructure works in the Project area.

c. Analyze the potential impact of the civil works planned under the Project in terms of erosion, sedimentation of streams and waterways, blockage and modification of stream flows, and water quality.

d. Develop a mitigation plan for the anticipated effects, including the development of generic assessments and site selection and design construction guidelines which must be followed at the time of implementation.

e. Be responsible for additional PEE assignments as proposed by the team leader, the Mission Environmental Officer, and other Mission personnel

4. The Forester/Tropical Ecologist Specialist will:

a. Gather information on current status of forest lands and lands suited for forestry in the Project area.

b. Assess impacts of proposed Project activities, particularly road building, maintenance, and rehabilitation, and the promotion of cattle raising, on forest cover.

c. Evaluate species to be used for reforestation for their potential suitability for 1) firewood production; 2) commercial timber production; 3) soil- and hillside stabilization and watershed improvement qualities; 4) suitability for wildlife habitat.

d. Develop an strategy for the creation of a forestry support activity for incorporation to the CSD Project.

e. Gather and summarize any existing information on native species found in the area of Project influence, including range and status information where available.

f. Identify Project impacts on native fauna and flora and on habitats, particularly in relation to endemic, rare, threatened or endangered species.

g. Gather and summarize existing information on forest plants having economic uses and the potential for contributing to sustainable development within the Project area.

h. Develop mitigation measures for anticipated effects.

5. The Rural Sociologist/Planning Specialist will:

a. Gather and summarize socio-economic information on the Project areas.

b. Examine the potential negative social effects of opening new roads or reconditioning existing ones, such as uncontrolled colonization and deforestation.

c. Recommend an effective mitigation plan to prevent that road building activities result in lowering the transaction costs for illegal loggers and poachers.

d. Analize the social effects of crop substitution.

e. Recommend land use policy/planning measures for the Project areas.

f. Recommend Project actions in support of improved natural resources management.

g. Be responsible for additional PEE assignments as proposed by the team leader, the Mission Environmental Officer, and other Mission personnel.

VI. Reporting Requirements

The PEE Report will be structured according to the guidelines specified in 22 CFR 216.6. It will include for each type of the proposed Project interventions:

a) A description of the activity and a discussion of the possible environmental impacts.

b) Generic assessments analyzing environmental impacts of the proposed intervention and mitigation measures for the design and implementation stages.

c) Environmental guidelines, including formats and checklists, for the use of the implementing agencies at the design and implementation stage and for environmental monitoring after the implementation of the activity.

d) An assessment of the implementing agencies institutional capabilities for conducting environmental assessments and monitoring.

e) A plan for the provision of technical assistance and training under the CSD Project, to strengthen the capabilities of implementing agencies and ensuring sound environmental management for the Project.

Upon completion of the assignment, the Team Leader will submit five copies of a draft PEE report in English to USAID/Peru for review 36 work days after initiating the PEE. USAID/Peru will transmit the PEE, with comments, to A.I.D./LAC/DR/E for review; A.I.D./LAC/DR/E will transmit the draft PEE, with comments, to the Team Leader for production of the final PEE. Comments and recommendations will be incorporated by the Team Leader in the PEEs final report, either as attachments to the PEE or as modifications to the text of the PEE, at the discretion of the PEE Team Leader. Ten (10) printed copies of the PEE final report in English, and five (5) copies in Spanish, and a copy on computer diskette in WordPerfect 5.1 format, shall be presented to USAID/Peru, by the Team Leader, not later than one week after the PEE final approval by A.I.D./LAC/DR/E.

VII. Relationships and Responsibilities

The team will work under the general guidance of the USAID/Peru Chief of the Office of Rural Development and the supervision and guidance of the Mission Environmental Officer and the Chief of ORD/LGSD. The team will be assisted and guided, whenever possible, by the USAID/Peru Mission Environmental Officer (MEO), the Regional Environmental Advisor (REA/SA) and personnel of the Bureau Environmental Office (AID/LAC/DR/E).

Appendix III. Peru Environmental and Natural Resources Management Code

CODIGO DEL MEDIO AMBIENTE Y LOS RECURSOS NATURALES (1)

TITULO PRELIMINAR

I. Toda persona tiene el derecho irrenunciable a gozar de un ambiente saludable, ecologicamente equilibrado y adecuado para el desarrollo de la vida, y asimismo, a la preservación del paisaje y la naturaleza. Todos tienen el deber de conservar dicho ambiente.

Es obligación del Estado mantener la calidad de vida de las personas a un nivel compatible con la dignidad humana. Le corresponde prevenir y controlar la contaminación ambiental y cualquier proceso de deterioro o depredación de los recursos naturales que pueda interferir en el normal desarrollo de toda forma de vida y de la sociedad. Las personas están obligadas a contribuir y colaborar inexcusablemente con estos propósitos.

II. El medio ambiente y los recursos naturales constituyen patrimonio comun de la Nacion. Su proteccion y conservacion son de interes social y pueden ser invocados como causa de necesidad y utilidad públicas.

III. Toda persona tiene derecho a exigir una accion rápida y efectiva ante la justicia en defensa del medio ambiente y de los recursos naturales y culturales.

Se puede interponer acciones, aún en los casos en que no se afecte el interés económico del demandante o denunciante. El interes moral autoriza la accion aun cuando no se refiera directamente al agente o a su familia.

IV. El territorio de la República comprende a su patrimonio ambiental.

V. Son actividades ilegales, violatorias de los derechos a la salud y a un medio ambiente saludable, los movimientos transfronterizos de residuos o desechos.

VI. Toda persona tiene el derecho de participar en la definición de la política y en la adopción de las medidas de carácter nacional, regional y local relativas al medio ambiente y a los recursos naturales. De igual modo, a ser informada de las medidas o actividades que puedan afectar directa o indirectamente la salud de las personas o de la integridad del ambiente y los recursos naturales.

Todos están obligados a proporcionar a las autoridades las informaciones que éstas requieran en el ejercicio de sus atribuciones para el control y vigilancia del medio ambiente.

VII. El ejercicio del derecho de propiedad, conforme al interés social, comprende el deber del titular de actuar en armonia con el medio ambiente.

VIII. Es deber del Estado formar conciencia acerca de la importancia del medio ambiente, promoviendo la transmisión de los conocimientos, el desarrollo de las habilidades y destrezas y la formación de valores, en torno de los procesos ecológicos esenciales, los sistemas vitales de la diversidad biológica y del uso sostenido de los recursos.

La educacion ambiental es parte integrante de los programas educativos en todos los niveles.

IX: Ninguna consideración o circunstancia pueden legitimar o excusar acciones que pudieran implicar el exterminio de especies o sub-especies vegetales o animales.

X: Las normas relativas a la protección y conservación del medio ambiente y sus recursos son de orden público.

XI: El mantenimiento de los procesos ecológicos esenciales, la preservación de la diversidad genética y la utilización sostenida de las especies, de los ecosistemas y de los recursos naturales renovables, en general, es de carácter obligatorio.

La utilización de los recursos naturales no renovables debe efectuarse en condiciones racionales y compatibles con la capacidad de depuración o recuperación del ambiente y de regeneración de dichos recursos.

XII: Este Código prevalece sobre cualquier otra norma legal contraria a la defensa del medio ambiente y los recursos naturales.

CAPITULO I
POLITICA AMBIENTAL

ARTICULO 1: La política ambiental tiene como objetivo la protección y conservación del medio ambiente y de los recursos naturales a fin de hacer posible el desarrollo integral de la persona humana a base de garantizar una adecuada calidad de vida. Su diseño, formulación y aplicacion están sujetos a los siguientes lineamientos:

1. La conservación del medio ambiente y de los recursos naturales para satisfacer las necesidades y aspiraciones de las presentes y futuras generaciones. El Estado promueve el equilibrio dinámico entre el desarrollo socioeconómico, la conservación y el uso sostenido del ambiente y los recursos naturales.

2. La orientación de la educación ambiental, a fin de alcanzar el desarrollo sostenido del país, entendido como el uso de la biósfera por el ser humano, de tal manera que produzca el mayor y sostenido beneficio para las generaciones actuales, manteniendo su potencialidad para satisfacer las necesidades y aspiraciones de las generaciones futuras.

3. El aprovecharniento de los recursos naturales y de los demás elementos ambientales de modo compatible con el equilibrio ecológico y el desarrollo en armonía con el interés social y de acuerdo con los principios establecidos en este Código.

4. El control y la prevención de la contaminación ambiental, la conservación de los ecosistemas, el mejoramiento del entorno natural en los asentamientos humanos, el mantenimiento de los procesos ecológicos esenciales, la preservación de la diversidad genética y el aprovechamiento sostenido de las espe-

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ces, como elementos fundamentales para garantizar y elevar la calidad de vida de la población

5. Observar fundamentalmente el principio de la prevención, entendiéndose que la protección ambiental no se limita a la restauración de daños existentes ni a la defensa contra peligros inminentes, sino a la eliminación de posibles daños ambientales.

6. Efectuar las acciones de control de la contaminación ambiental, debiendo ser realizadas, principalmente, en las fuentes emisoras.

Los costos de la prevención, vigilancia, recuperación y compensación del deterioro ambiental corren a cargo del causante del perjuicio.

7. La rehabilitación de las zonas que resulten perjudicadas como consecuencia de actividades humanas para ser destinadas al bienestar de las poblaciones afectadas.

8. Tomar en cuenta que el ambiente no sólo constituye un sector de la realidad nacional, sino un todo integral de los sectores y actividades humanas. En tal sentido, las cuestiones y problemas ambientales deben ser considerados y asumidos globalmente y al más alto nivel,como cuestiones y problemas de política general, no pudiendo ninguna autoridad eximirse de tomar en consideración o de prestar su concurso a la conservacion del medio ambiente y los recursos naturales.

9. Velar porque las actividades que se lleven a cabo dentro del territorio nacional y en aquellas zonas donde ejercer soberania y jurisdiccion no afecten el equilibrio ecológico de otros paises o de zonas de jurisdiccion internacional. Asimismo, la actividad del Estado debe estar dirigida a velar para que las actividades que se lleven a cabo en zonas donde no ejerce soberania ni jurisdicción no afecten el equilibrio ecológico del pais.

ARTICULO 2: El régimen tributario garantizará una efectiva conservación de los recursos naturales, su recuperación y la promocion del desarrollo sustentable.

CAPITULO II
DE LA PLANIFICACION AMBIENTAL

ARTICULO 3: Los preceptos de carácter general y los principios de politica ambiental contenidos en este código y en las normas que se dicten con posterioridad a su promulgación serán obligatoriamente tomadas en cuenta en los planes de desarrollo que los gobiernos nacional, regionales y locales formulen, de acuerdo con la Constitución.

ARTICULO 4: La planificación ambiental tiene por objeto crear las condiciones para el restablecimiento y mantenimiento del equilibrio entre la conservación del medio ambiente y de los recursos naturales para el desarrollo nacional con el fin de alcanzar una calidad de vida compatible con la dignidad humana.

ARTICULO 5: La planificación ambiental comprende el ordenamiento del territorio, de los asentamientos humanos y de los recursos para permitir una

utilización adecuada del medio ambiente a fin de promover el desarrollo económico sostenido.

ARTICULO 6: En los [illegible] de planificación participan la sociedad, los gobiernos nacional, regionales y locales.

ARTICULO 7: Para el ordenamiento ambiental, la autoridad competente considerará fundamentalmente los siguiente criterios:

1. La naturaleza y características de cada ecosistema.
2. La aptitud en cada zona en función de sus recursos naturales, la distribución de la población y las actividades económicas predominantes.
3. Los desequilibrios existentes en los ecosistemas por efecto de los asentamientos humanos, de las actividades económicas o de otras actividades humanas o fenómenos naturales.
4. El equilibrio indispensable de los asentamientos humanos y sus condiciones ambientales.
5. El impacto ambiental de nuevos asentamientos humanos, obras o actividades.
6. La capacidad asimilativa del área.
7. Los hábitos y costumbres de cada región.

CAPITULO III
DE LA PROTECCION DEL AMBIENTE

ARTICULO 8: Todo proyecto de obra o actividad, sea de carácter público o privado, que pueda provocar daños no tolerables al ambiente, requiere de un Estudio de Impacto Ambiental (EIA) sujeto a la aprobación de la autoridad competente.

En particular, debera elaborarse un EIA con respecto a las siguientes actividades:

a) Irrigaciones, represamientos, hidroeléctricas y otras obras hidráulicas.
b) Obras de infraestructura vial y de transporte.
c) Urbanizaciones.
d) Instalación de oleoductos, gaseoductos y similares.
e) Proyectos de desarrollo energético.
f) Actividades mineras, pesqueras y forestales.
g) Obras y actividades permitidas en áreas protegidas.
h) Industrias químicas, petroquímicas, metalúrgicas, siderúrgicas o cualquiera actividad que pueda generar emanaciones, ruidos o algún tipo de daño intolerable.
i) Construcciones y ampliaciones de zonas urbanas.
j) Empresas agrarias.

La autoridad competente queda facultada a exigir este requisito en proyectos que puedan generar daños no tolerables distintos a los señalados anteriormente.

El reglamento determinará las pautas de detalle de estos estudios según la obra o actividad a efectuarse.

ARTICULO 9: Los estudios de impacto ambiental contendrán una descripción de la actividad propuesta, y de los efectos directos o indirectos previsibles de dicha actividad en el medio ambiente físico y social, a corto y largo plazo, así como la evaluación técnica de los mismos. Deberán indicar igualmente, las medidas necesarias para evitar o reducir el daño a niveles tolerables, e incluirá un breve resumen del estudio para efectos de su publicidad.

La autoridad competente señalará los demás requisitos que deben contener los EIA.

ARTICULO 10: Los estudios de impacto ambiental sólo podrán ser elaborados por las instituciones públicas o privadas debidamente calificadas y registradas ante la autoridad competente. El costo de su elaboracion es de cargo del titular del proyecto o actividad.

ARTICULO 11: Los estudios de impacto ambiental se encuentran a disposición del público en general. Los interesados podrán solicitar se mantenga en reserva determinada información cuya publicidad pueda afectar sus derechos de propiedad industrial o comerciales de carácter reservado o seguridad personal.

ARTICULO 12: La autorizacion de la obra o actividad indicará las condiciones de cumplimiento obligatorio para la ejecucion del proyecto.

ARTICULO 13: A juicio de la autoridad competente, podran exigirse la elaboración de un estudio de impacto ambiental para cualquier actividad en curso que esté provocando impactos negativos en el medio ambiente, a efectos de requerir la adopcion de las medidas correctivas pertinentes.

CAPITULO IV
DE LAS MEDIDAS DE SEGURIDAD

ARTICULO 14: Es prohibida la descarga de sustancias contaminantes que provoquen degradacion de los ecosistemas o alteren la calidad del ambiente, sin adoptarse las precauciones para la depuración.

La autoridad competente se encargará de aplicar las medidas de control y muestreo para velar por el cumplimiento de esta disposición.

ARTICULO 15: Queda prohibido verter o emitir residuos sólidos, líquidos o gaseosos u otras formas de materia, o de energía que alteren las aguas en proporción capaz de hacer peligrosa su utilización. La autoridad competente efectuará muestreos periódicos de las aguas para velar por el cumplimiento de esta norma.

ARTICULO 16: Esta prohibido internar al territorio nacional residuos o desechos, cualquiera sea su origen o estado material.

ARTICULO 17: Está igualmente prohibida la importación de productos químicos que carezcan de autorización por la autoridad competente.

ARTICULO 18: En los casos de peligro inminente para el medio ambiente y según su gravedad, la autoridad ambiental, una vez evaluado el caso, debe

ordenar y disponer una o mas de las siguientes medidas:

a) Uso de las modalidades y procedimientos que disminuyan o hagan desaparecer el riesgo.
b) Limitación de las actividades que provocan riesgo ambiental.
c) Suspensión de las actividades que generen dicho riesgo.

En caso que el riesgo fuera capaz de causar un daño irreversible se podrán aplicar las siguientes medidas:

a) Clausura del local o establecimiento en el que se lleva a cabo las actividades riesgosas.
b) Decomiso de los objetos, instrumentos y artefactos tecnológicos empleados que provocan el riesgo ambiental detectado.
c) Cancelación de permisos o licencias.

ARTICULO 19: Las medidas de seguridad que sean dictadas podrán ser materia de impugnación, de acuerdo con lo establecido por el Reglamento de Normas Generales de Procedimientos Administrativos. La interposición del recurso impugnatorio no suspenderá la ejecución de la medida de seguridad dispuesta por la autoridad competente.

CAPITULO V
DE LA EVALUACION, VIGILANCIA Y CONTROL

ARTICULO 20: La evaluación técnica del ambiente, y de los recursos naturales corresponde a la autoridad competente. Esta debe preparar un informe anual que recoja la evaluacion técnica, la misma que constará de un diagnóstico de la calidad del ambiente y la evaluación de las medidas que fueron tomadas a fin de cumplir con los principios de política ambiental y los preceptos contenidos en este código. Dicho informe será remitido en la primera semana del segundo semestre del año al Presidente de la República, al Congreso y obligatoriamente publicado en el diario oficial.

ARTICULO 21: El Estado valoriza en términos económicos, sociales y ecológicos el patrimonio natural de la nación e informa de los incrementos y detrimentos que lo afecten. El Presidente de la República debe incluir obligatoriamente dentro de su mensaje anual a la nación, dicha información.

ARTICULO 22: La autoridad ambiental está investida de la facultad de inspeccionar los locales, establecimientos, o cualquier otro tipo de área, donde se lleve a cabo actividades que generen riesgo ambiental, así como exigir la información que le permita verificar el cumplimiento de las disposiciones legales.

La autoridad ambiental podrá solicitar la intervención de la fuerza publica para el cumplimiento de las medidas y sanciones que disponga.

ARTICULO 23: El control tiene por objeto hacer una evaluación y proyección de las actividades que generen riesgos de daño ambiental. El Estado proveerá a la autoridad ambiental los recursos necesarios para realizar control en aquellas actividades que presentan un potencial de riesgo contra el medio

ambiente

ARTICULO 24: La vigilancia y control de las actividades que generen riesgo contra el ambiente serán financiadas con los recursos que provea el Estado para tal fin y con los que recaude por aplicación de sanciones la autoridad competente al amparo de esta ley, a las personas naturales sometidas a dicha vigilancia y control.

CAPITULO VI
DE LA CIENCIA Y TECNOLOGIA

ARTICULO 25: Las investigaciones científicas están orientadas en forma prioritaria a la realización y actualización de los inventarios de recursos naturales y a la identificación de indicadores de calidad ambiental, así como a establecer criterios para el manejo eficiente e esos recursos.

ARTICULO 26: Corresponde a los poderes del Estado, en cumplimiento de su obligación constitucional, promover y fomentar la investigación científica y tecnológica que permita cuantificar, prevenir, controlar y revertir el deterioro ambiental, aportando alternativas de solución a los problemas vinculados a la protección del medio ambiente con tecnologías adecuadas.

Igualmente, el Estado debe promover y fomentar la investigación científica y tecnológica que permita desarrollar nuevos sistemas, métodos, equipos y dispositivos a fin de proteger al ambiente y conservar los recursos naturales.

ARTICULO 27: Los organismos competentes de ciencia y tecnología, están obligados a dar preferencia a la aplicación de recursos orientados a la formación de profesionales y técnicos para la realización de estudios científicos y tecnológicos en materia ambiental y el desarrollo de tecnologías apropiadas que permitan un adecuado control y conservación del ambiente.

ARTICULO 28: Las empresas públicas o privadas y en general toda persona que por el desarrollo de su actividad cause o pueda causar deterioro al medio ambiente, están obligadas a incorporar adelantos científicos y tecnológicos para reducir y eliminar el efecto contaminante o desestabilizador del mismo. La autoridad competente establecerá los plazos y procedimientos que se requieran para tal fin.

ARTICULO 29: El Estado a través de las entidades públicas competentes, brinda apoyo técnico a las comunidades campesinas y nativas en cuanto a la utilización, recuperación y conservación de los recursos naturales, para una mejor satisfacción de sus necesidades. Asimismo, impulsa el uso de las tecnologías tradicionales ecológicamente adecuadas.

CAPITULO VII
DE LA ACCION EDUCATIVA, LOS MEDIOS DE COMUNICACION Y LA PARTICIPACION CIUDADANA

ARTICULO 30: El Estado, a través del Ministerio de Educación, debe incluir en los planes y programas educativos, asignaturas y contenidos orientados a

la conservación y uso racional del medio ambiente y de los recursos naturales.

A través de los organismos competentes otorgará becas y créditos educativos teniendo en cuenta que es prioritaria la capacitación de profesionales y técnicos en el área de conservación del medio ambiente.

ARTICULO 31: La enseñanza sistemática del presente Código, de sus principios, objetivos, lineamientos y contenidos, es obligatoria en los centros de educación civiles y militares en todos sus niveles. Es deber del Estado lograr la difusión gratuita a nivel nacional de este Código.

Las Facultades de Derecho de las Universidades del país implementarán cursos regulares de Derecho Ambiental.

ARTICULO 32: Los medios de comunicación social del Estado y los privados; en aplicación de los principios contenidos en este Código, fomentarán y apoyarán las acciones tendientes a la defensa y preservación de la calidad ambiental y del adecuado uso de los recursos naturales.

ARTICULO 33: Los medios de comunicación social del Estado y los privados, incluirán obligatoriamente, dentro de los espacios culturales que están obligados a difundir por Ley, programas de difusión de los conocimientos sobre la necesidad de proteger el ambiente y los recursos naturales.

ARTICULO 34: La comunidad participa directa o indirectamente en la definición de la política ambiental y en la ejecución y aplicación de los instrumentos de dicha política.

ARTICULO 35: Cualquier persona podrá poner en conocimiento de la autoridad competente, los hechos que hicieran procedente la adopción de las medidas necesarias para la protección del ambiente.

CAPITULO VIII
DEL PATRIMONIO NATURAL

ARTICULO 36: El patrimonio natural de la Nación está constituido por la diversidad ecológica, biológica y genética que alberga su territorio. Los ecosistemas, los procesos naturales, las especies de flora y fauna, las variedades de las especies domésticas nativas, los paisajes y las interrelaciones entre estos elementos, son las manifestaciones principales del patrimonio natural.

ARTICULO 37: Es obligación perentoria del Estado y de las personas naturales y jurídicas velar por la conservación, defensa, recuperación, aprovechamiento sostenido y difusión del patrimonio natural de la Nación.

El Estado impulsa su investigación, evaluación, planificación, manejo, difusión y control.

CAPITULO IX
DE LA DIVERSIDAD GENETICA Y LOS ECOSISTEMAS

ARTICULO 38: La población de todas las especies se mantendrá a un nivel

por lo menos suficiente para garantizar su supervivencia. Asimismo, se salvaguardarán los ambientes necesarios para ese fin. El Estado vela por la conservación de dichas especies y el mantenimiento de su diversidad.

ARTICULO 39: El Estado concede protección especial a las especies de carácter singular y a los ejemplares representativos de los diferentes tipos de ecosistemas, así como al germoplasma de las especies domésticas nativas.

Aquellas especies cuya supervivencia se encuentre amenazada, en peligro o en vías de extinción, serán objeto de rigurosos mecanismos de control y protección que garanticen su conservación.

ARTICULO 40: La introducción de especies exóticas que puedan alterar la diversidad de especies de un ecosistema, debe ser previamente autorizada por la autoridad competente.

Aún en tales casos, los daños previsibles que tal acción ocasione será de responsabilidad de dicha autoridad.

No será autorizada la introducción de aquellas especies exóticas cuyo efecto pernicioso se encuentre debidamente comprobado.

ARTICULO 41: La introducción al país de especies animales o vegetales, sólo podrá efectuarse previa autorización de la autoridad competente.

Para conceder la autorización, se tendrán en cuenta, entre otros, los siguientes criterios:

a) Las reacciones de las nuevas especies en el medio en el que van a ser implantadas.
b) Las reacciones del medio receptor y de las especies nativas respecto de las que se pretende introducir.
c) El riesgo de razas o biotipos potencialmente peligrosos.

ARTICULO 42: Las especies de fauna silvestre cuya naturaleza lo permita, podrán ser reproducidas en zoocriaderos o áreas de manejo

El Reglamento establecerá las condiciones mínimas de carácter técnico, científico y biológico de observancia obligatoria para el establecimiento y conducción de zoocriaderos de especies amenazadas en peligro o en vías de extinción, aún cuando no hubieran sido declaradas en veda. En tales casos, los zoocriaderos estarán sujetos a la supervisión del Estado cuando sean particulares o personas jurídicas los encargados de su administración.

ARTICULO 43: Los zoocriaderos con fines comerciales, científicos y de difusión cultural de especies amenazadas, podrán ser establecidos y administrados por particulares, siempre que cumplan con las disposiciones de crianza y comercialización que establezca la autoridad competente para cada especie. El incumplimiento de esta disposición o de las normas reglamentarias que sean establecidas para su correcta aplicación dará lugar a la cancelación del permiso y el decomiso de los especímenes.

ARTICULO 44: La autoridad competente dicta las medidas necesarias para evitar la introducción o diseminación de enfermedades animales o vegetales.

El Estado establecerá sistemas de prevención y control epidemiológicos y fomentará el uso de sistemas de control biológico.

ARTICULO 45: Para la importación de cualquier especimen de flora o fauna deberá contarse con las certificaciones oficiales de haber cumplido con las normas del país de origen sobre sanidad vegetal o animal y de protección de las especies.

ARTICULO 46: Los recursos genéticos de las especies que habitan en el territorio nacional son conservadas y aprovechadas en beneficio de las generaciones presentes y futuras. El Estado prohíbe la exportación de recursos genéticos en los casos que lo crea conveniente.

ARTICULO 47: Es obligación del Estado promover el desarrollo y utilización en el lugar de origen de los recursos genéticos como medio para conservar su existencia en beneficio de la Nación.

El Estado fomenta y apoya la investigación de los recursos genéticos para determinar su potencial y posibilidades de uso sostenido.

ARTICULO 48: La conservación de los recursos genéticos en el lugar deberá desarrollarse mediante la organización de bancos genéticos, herbarios, jardines botánicos, zoológicos y otros medios adecuados.

Son, especialmente responsables de esta conservación las universidades, museos, entidades científicas y los organismos técnico-normativos vinculados con esta tarea.

ARTICULO 49: Es obligación del Estado proteger y conservar los ecosistemas que comprende su territorio, entendiéndose éstos, como las interrelaciones de los organismos vivos entre sí y con su ambiente físico. El aprovechamiento sostenido de los ecosistemas debe garantizar la permanencia de estos procesos naturales.

CAPITULO X
DE LAS AREAS NATURALES PROTEGIDAS

ARTICULO 50: Es obligación del Estado proteger muestras representativas de los diversos tipos de ecosistemas naturales existente en el territorio nacional a través de un sistema de áreas protegidas.

ARTICULO 51: Son áreas naturales protegidas las extensiones del territorio nacional que el Estado destina a fines de investigación, protección o manejo controlado de sus ecosistemas, recursos y demás riquezas naturales.

Las áreas naturales protegidas son de dominio público y constituyen muestras representativas del patrimonio natural de la Nación. Se establecen con carácter definitivo.

La comunidad tiene derecho a participar en la identificación, delimitación y resguardo de estas áreas y la obligación de colaborar en la consecución de sus fines.

ARTICULO 52: En la Carta Nacional y en todos los mapas del país que divulguen con fines científicos, técnicos, educativos, turísticos, comerciales o de cualquier otra índole, deben figurar las áreas naturales protegidas por el Estado

ARTICULO 53: El ejercicio de la propiedad y de los demás derechos adquiridos con anterioridad al establecimiento de las áreas naturales protegidas, debe hacerse en armonía con los objetivos y fines para los cuales éstas fueron creadas. El Estado evaluará, en cada caso, la necesidad de imponer otras limitaciones al ejercicio de dichos derechos.

Podrán expropiarse aquellos derechos cuyo ejercicio sea contrario a los fines y objetivos de las áreas naturales protegidas. Igualmente, pueden ser resueltos los contratos celebrados con el Estado cuya ejecución perjudique o ponga en peligro la protección o conservación de las áreas naturales protegidas. En este último supuesto, el Estado considerará una indemnización justipreciada que resarza las mejoras y otras inversiones que no puedan ser recuperadas por el afectado.

ARTICULO 54: El Estado reconoce el derecho de propiedad de las comunidades campesinas y nativas ancestrales sobre las tierras que poseen dentro de las áreas naturales protegidas y en sus zonas de influencia; promueve la participación de dichas comunidades para los fines y objetivos de las áreas naturales protegidas donde se encuentran

ARTICULO 55: Son objetivos generales de las áreas naturales protegidas los siguientes:

a) Proteger y mejorar la calidad del medio ambiente
b) Proteger y conservar muestras de la diversidad natural.
c) Mantener los procesos ecológicos esenciales y detener el deterioro de los mismos.
d) Conservar, incrementar, manejar y aprovechar sostenidamente los recursos naturales renovables.
e) Preservar, conservar, restaurar y mejorar la calidad del aire, de las aguas y de los sistemas hidrológicos naturales.
f) Conservar, restaurar y mejorar la capacidad productiva de los suelos.
g) Proteger y conservar muestras representativas de cada una de las especies de flora y fauna nativas y de su diversidad genética.
h) Proteger, conservar y restaurar paisajes singulares.
i) Conservar formaciones geológicas, geomorfológicas y fisiográficas.
j) Proteger, conservar y restaurar los escenarios naturales donde se encuentren muestras del patrimonio cultural de la Nación o se desarrollaron acontecimientos gloriosos de la historia nacional.

ARTICULO 56: Las áreas naturales protegidas por el Estado pueden ser nacionales, regionales y locales, según el gobierno que las crea. Las políticas de manejo las establece el Gobierno Nacional. Su administración corresponde al órgano del gobierno que las estableció.

Las áreas naturales protegidas de carácter regional o local pueden ser elevadas a la categoría de nacionales por el Gobierno Nacional. En tales casos, su

administración será de su responsabilidad.

ARTICULO 57: Las áreas naturales protegidas de carácter nacional son establecidas por Decreto Supremo refrendado por el Ministro de Agricultura.

Las áreas naturales protegidas de carácter regional son determinadas por Resolución Legislativa Regional.

Las áreas naturales protegidas de carácter local, son establecidas por acuerdo de Concejo.

ARTICULO 58: En la denominación de las áreas naturales protegidas se agregará la indica[illegible]

CAPITULO XI
DEL PATRIMONIO NATURAL CULTURAL

ARTICULO 59: El Estado reconoce como recurso natural cultural a toda obra de carácter arqueológico o histórico que al estar integrada al medio ambiente permite su aprovechamiento racional y sostenido.

ARTICULO 60: Los gobiernos regionales y locales conjuntamente con el Instituto Nacional de Cultura y sus entidades regionales, son responsables de la protección, restauración y aprovechamiento del patrimonio natural cultural.

El Estado autoriza su utilización en armonía con el carácter de intangible.

ARTICULO 61: Las áreas que contengan dichos recursos no son materia de denuncios agrícolas, minero, forestal, urbano o de otra índole.

Las áreas donde se ubicasen andenes, canales, acueductos o cualquier otra obra de carácter arqueológico o histórico serán excluidos de cualquier concesión.

CAPITULO XII
DE LOS RECURSOS MINEROS

ARTICULO 62: Las personas naturales o jurídicas dedicadas a actividades mineras, requieren de la aprobación de los proyectos de ubicación, diseño y funcionamie o de la autoridad competente para iniciar la construcción de las áreas o depósitos de desechos minero-metalúrgicos. Dicha aprobación está supeditada a especificaciones expresas de pautas y obligaciones inherentes a la defensa del medio ambiente y de los recursos naturales.

Está prohibido el otorgamiento de licencias provisionales cualquiera sea su denominación.

ARTICULO 63: Los desechos minero-metalúrgicos no podrán ser depositados en terrenos en los que exista riesgo de precipitación por fenómenos naturales. En ningún caso podrán ser ubicados a menos de 500 metros de los cuerpos de agua cuyas riberas sean estables. En los casos de riberas fluctuantes se requiere de estudios específicos previos.

Los desechos que fuesen arrojados al mar deberán encontrarse en condic[illegible]

nes técnicamente aceptables para no alterar la salud humana y las cualidades del ecosistema.

Considérase como condiciones técnicamente aceptables para estos efectos los estándares internacionales establecidos por las Naciones Unidas.

ARTICULO 64: En el diseño y construcción de las áreas o depósitos de relaves u otros desechos mineros, serán necesariamente consideradas las medidas apropiadas cuando tales instalaciones se las deje de utilizar, a fin de prevenir mayores daños al ambiente y permitir, dentro de lo posible, la recuperación de los recursos afectados.

ARTICULO 65: Las personas dedicadas a actividades minero-metalúrgicas están obligadas a incluir en sus instalaciones equipos de control de contaminantes adecuadamente mantenidos, así como llevar un registro del funcionamiento de los mismos y de su grado de eficiencia.

ARTICULO 66: La exploración y explotación de recursos minerales deberá ajustarse a las siguientes disposiciones:

a) Las aguas que sean utilizadas en el procesamiento y descarga de minerales, deben ser materia de un adecuado tratamiento, cuando ello resulte necesario de manera que se posibilite su utilización.
b) En las explotaciones mineras a cielo abierto, deberán adoptarse medidas que garanticen la estabilización del terreno y de ser el caso, la restauración del paisaje.
c) Toda explotación minera con uso de explosivos en las proximidades de centros poblados, deberá disminuir el impacto del ruido, del polvo y de las vibraciones a niveles tolerables para el medio ambiente, a la salud humana y la propiedad.

ARTICULO 67: Los residuos radioactivos evacuados de las instalaciones minero-metalúrgicas, no deberán superar los límites tolerables establecidos por los estándares internacionales que determine la autoridad ambiental. Los responsables de las instalaciones efectuarán periódicamente mediciones de las descargas e informarán a la autoridad ambiental de cualquier alteración detectada sin perjuicio de adoptar las medidas que resulten necesarias para prevenir o evitar daños al ambiente, a la salud humana o la propiedad.

ARTICULO 68: Las instalaciones donde se concentre, refine y enriquezcan minerales, dispondrán de normas de seguridad, tratamiento de desechos y sistemas de control de las descargas al ambiente.

ARTICULO 69: La autoridad competente efectuará permanentemente muestreos de los suelos, aguas y aires a fin de evaluar los efectos de la contaminación provocada por la actividad minero-metalúrgica y su evolución por períodos establecidos a fin de adoptar las medidas preventivas o correctivas que correspondan.

ARTICULO 70: Las concesiones mineras podrán ser expropiadas por causa de necesidad y utilidad pública o de interés social, previo pago de indemnización justipreciada. Sin embargo, revertirán al Estado sin derecho a pago alguno, aquellas que se conduzcan en contravención con las normas de

seguridad y prevención establecidas en el presente Código, en las leyes sobre la materia y en normas reglamentarias.

CAPITULO XIII
DE LOS RECURSOS ENERGETICOS

ARTICULO 71: Es prohibido desarrollar actividades para aprovechamiento energético o de recursos naturales no renovables en el ámbito de las áreas naturales protegidas.

ARTICULO 72: En caso de adoptarse la decisión de desarrollar aprovechamientos energéticos localizados en la región de la Selva que puedan afectar áreas naturales protegidas o derechos de comunidades nativas, el proyecto respectivo debe incluir los costos de reposición de las áreas afectadas.

ARTICULO 73: Los aprovechamientos energéticos, su infraestructura, así como el transporte, transformación, distribución, almacenamiento y utilización final de la energía, deben ser realizados sin ocasionar contaminación del suelo, agua o aire. Debe emplearse las mejores tecnologías para impedir que los daños ambientales sean irreparables.

ARTICULO 74: En el costo de construcción y operación de los aprovechamientos hidroenergéticos será considerado el costo de prevención y manejo de la cuenca colectora que lo abastece, en especial el establecimiento y manejo de bosques de protección y de programas de reforestación, según sea el caso.

ARTICULO 75: Todo aprovechamiento de energía de la biomasa forestal debe ser aprobado por la autoridad competente en asuntos forestales y conducido con su participación, siendo obligatoria la reposición del recurso explotado.

ARTICULO 76: Los trabajos de exploración y extracción petrolífera, así como aquellos de recuperación secundaria de yacimientos de hidrocarburos o gases naturales, deben ser cumplidas las condiciones y requisitos establecidos por la autoridad competente, con la finalidad de que los procesos de producción y transporte así como las aguas y otras sustancias utilizadas no originen riesgos o perjuicios ambientales.

ARTICULO 77: Durante la extracción y manipuleo de los fluidos de un yacimiento petrolífero se debe adoptar, bajo responsabilidad, el uso de técnicas y de los medios necesarios para evitar la pérdida o daño de recursos naturales. En todos los casos, las empresas deben contar con el equipo adecuado para detectar y evaluar los agentes ambientales nocivos que puedan presentarse.

CAPITULO XIV
DE LA POBLACION Y EL AMBIENTE

ARTICULO 78: El Estado promueve y fomenta la adecuada distribución de las poblaciones en el territorio nacional de acuerdo con la capacidad de

soporte de los ecosistemas que lo conforman.

ARTICULO 79: Es deber del Estado incentivar y difundir los programas nacionales que orienten y ordenen racionalizar el crecimiento demográfico de la población.

ARTICULO 80: Son elementos constitutivos de los asentamientos humanos, el suelo donde se emplazan, las aguas que le sirven, la atmósfera que los cobija, el paisaje que los rodea, los recursos naturales que sustentan su economía y la infraestructura económica y social que dan forma a la organización y acondicionamiento del espacio.

ARTICULO 81: Los planes o actividades que impliquen modificaciones en cualesquiera de los elementos constitutivos de los asentamientos humanos deben contar con la aprobación del gobierno local.

ARTICULO 82: Es de responsabilidad de los gobiernos locales controlar la adecuada utilización de los elementos que conforman los asentamientos humanos, de acuerdo con la legislación vigente.

ARTICULO 83: Los asentamientos humanos se localizarán preferentemente:

a) En zonas próximas a fuentes de agua, siempre que no estén destinadas a actividades agrícolas.
b) En suelos cuya estabilidad y resistencia garanticen la seguridad de las estructuras y edificaciones en general y cuya topografía favorezca un buen drenaje de aguas, evacuación de desagues y una fácil organización física del asentamiento.
c) En lugares protegidos no susceptibles de desastres naturales, tales como: huaycos, deslizamiento de tierras, fallas geológicas activas, desbordes de lagos, lagunas, glaciares y ríos, o cualquier otra causa que constituya peligro para la vida y las actividades humanas.
d) En áreas que se encuentren suficientemente alejadas de zonas de peligro de ambiente contaminado, tales como: lechos de ríos o avenidas y zonas de deyección; zonas expuestas a las variaciones marítimas; terrenos inundables, pantanosos y de rellenos; basurales, zonas de eliminación de desechos que produzcan emanaciones u otros peligros para la salud.

ARTICULO 84: No se permitirá en las zonas ocupadas por asentamientos humanos y en sus correspondientes áreas de influencia inmediata, la localización de industrias y otras actividades que produzcan o puedan originar efectos contaminantes en el suelo, subsuelo, aire o agua, o signifiquen algún grado de peligrosidad para la población.

ARTICULO 85: El acondicionamiento de todo asentamiento humano debe contar con el nivel básico de habitabilidad que apruebe el gobierno local de acuerdo con las normas establecidas por los organismos competentes.

ARTICULO 86: En la planificación y control del crecimiento de los asentamientos humanos se considerará en forma especial el imperio de las disposiciones sobre intangibilidad de áreas agrícolas, conservación de áreas declaradas como patrimonio cultural, mantenimiento o adaptación al paisaje circundante y conservación de áreas protegidas

ARTICULO 87: Las licencias de habilitación de asentamientos humanos que no se ajusten a los planes de ordenamiento urbano y zonificación, debidamente aprobados, son nulas de pleno derecho.

ARTICULO 88: La propiedad debe usarse de acuerdo con la zonificación estblecida. Todo cambio de uso debe ser autorizado por el gobierno local correspondiente.

ARTICULO 89: Constituyen áreas públicas inalienables e imprescriptibles, los espacios abiertos de uso público como vías, calles, plazas, alamedas, parques, playas, y otros espacios naturales o seminaturales, dentro del entorno urbano. Cualquier autoridad o funcionario que contravengan estas disposiciones, será sancionado conforme a ley.

ARTICULO 90: El uso de un área pública, para otros fines, obliga al ocupante a restituirla a su condición original y a indemnizar al Estado por un monto equivalente al usufructo comercial del bien, calculado de oficio a precio de mercado a la fecha de la restitución, por el tiempo que haya durado la ocupación.

CAPITULO XV
DE LA PREVENCION DE LOS DESASTRES NATURALES

ARTICULO 91: Todas las entidades nacionales, públicas y privadas, personas naturales o jurídicas, están obligadas a participar en la prevención y solución de los problemas producidos por los desastres naturales.

ARTICULO 92: Es responsabilidad del Estado a través del Sistema Nacional de Defensa Civil, coordinar con los sectores público y privado, la formulación, ejecución y actualización de los planes respectivos para afrontar desastres naturales o inducidos, que puedan producirse en cualquier área del país, así como la ejecución de acciones orientadas a la atención y rehabilitación de las áreas afectadas.

ARTICULO 93: Los medios de comunicación social del Estado y privados, programarán espacios gratuitos para la difusión de los mecanismos que orienten a la población en acciones de defensa civil.

ARTICULO 94: El Sector Educación incluirá dentro de los planes y programas educativos, contenidos teóricos y prácticos de defensa civil, en coordinación con el organismo competente encargado de la prevención de desastres del Sistema Nacional de Defensa Civil.

ARTICULO 95: Todo centro de trabajo y estudios debe permitir, facilitar y desarrollar los programas de capacitación y prácticas de evacuación que establezca el Sistema Nacional de Defensa Civil.

CAPITULO XVI
DE LA INFRAESTRUCTURA ECONOMICA Y DE SERVICIOS

ARTICULO 96: La habilitación y rehabilitación de la infraestructura económi-

ca y de servicios se planifica y se ejecuta observando los planes de ordenamiento y zonificación que sean aprobados previo estudio de la capacidad asimilativa del área.

ARTICULO 97: Sólo se permitirá la ubicación de cualquier tipo de infraestructura en zonas adyacentes a las áreas naturales protegidas, en los casos que se garantice las máximas medidas de protección para dichas áreas a fin de preservar sus condiciones naturales de los ámbitos geográficos declarados como áreas naturales protegidas.

La ubicación de cualquier tipo de infraestructura en un área adyacente, sólo será permitida en los casos en que se garanticen las máximas condiciones de protección para dichas áreas.

La autorización se otorgará previa opinión favorable de la autoridad competente.

ARTICULO 98: Para los casos a que se refiere el artículo precedente, la ubicación de la infraestructura, no obstaculizará en ningun sentido la accesibilidad a las áreas naturales protegidas.

ARTICULO 99: En la planificación urbana, se tendrá en cuenta las tendencias de expansion de las ciudades, la localización de aeropuertos y demas fuentes productoras de ruidos y emanaciones dificilmente controlables o nocivos a la salud humana y el respeto irrestricto a las sementeras o áreas de cultivo agrícola.

CAPITULO XVII
DE LA SALUBRIDAD PUBLICA

ARTICULO 100: El Ministerio de Salud es la autoridad competente para dictar las normas generales, en lo referente a salubridad publica y para evaluar y controlar su cumplimiento.

Compete a los gobiernos regionales y locales dictar las normas especificas en su jurisdicción y velar por su correcta aplicación.

CAPITULO XVIII

DE LA LIMPIEZA PUBLICA

ARTICULO 101: El mantenimiento de la limpieza pública es obligación de todos los habitantes de las ciudades y de todo asentamiento humano. A nadie le es permitido arrojar a la vía pública desperdicios, desechos domésticos, industriales o residuos.

ARTICULO 102: Es obligación del Estado a través de los gobiernos locales, controlar la limpieza pública en las ciudades y en todo tipo de asentamiento humano considerando necesariamente las etapas de recoleccion, transporte y disposición final de los desechos domésticos, asi como la educación de sus habitantes.

ARTICULO 103: La prestación del servicio de limpieza pública en cualquiera de sus etapas, ya sea a través de los gobiernos locales o empresas privadas, debe sujetarse a las normas sanitarias y exigencias técnicas que establezca la autoridad competente. Tratandose de empresas privadas se requerirá de la autorización respectiva.

ARTICULO 104: Los gobiernos locales adoptaran las medidas necesarias a fin de difundir en la comunidad los mecanismos apropiados para la clasificación y ubicación de los desechos domésticos en el propio lugar de origen, según su naturaleza.

ARTICULO 105: La disposición final de los desechos domésticos, se realizará únicamente en aquellos lugares previamente determinados por el gobierno local correspondiente y de acuerdo con las disposiciones sanitarias vigentes.

ARTICULO 106: El Estado fomenta y estimula el reciclaje de desechos domésticos para su industrialización y reutilización, mediante los procedimientos sanitarios que apruebe la autoridad competente.

CAPITULO XIX
DEL AGUA Y ALCANTARILLADO

ARTICULO 107: Es de responsabilidad del Ministerio de Salud garantizar la calidad del agua para consumo humano y en general, para las demás actividades en que su uso es neesario.

ARTICULO 108: El Estado debe fijar el destino de las aguas residuales, estableciendo zonas en las que quede prohibido descargar aguas residuales de fuentes industriales o domésticas, urbanas o rurales, en las aguas superficiales y subterráneas, interiores o marinas, sin tratamiento previo y en cantidades y concentraciones que sobrepasen los niveles admisibles.

ARTICULO 109: Para iniciar la construcción, ensanche o alteración de asentamientos humanos, se requerirá de planes de desague, cañerías, alcantarillado y métodos de tratamiento y disposición de aguas residuales, previamente aprobados.

ARTICULO 110: Las industrias grandes, medianas, pequeñas o artesanales, sólo podrán descargar sus efluentes en el sistema de alcantarillado público, previa aprobación de la autoridad competente.

ARTICULO 111: El Estado fomenta el tratamiento de aguas residuales con fines de reutilización, siempre y cuando ésta recuperen los niveles cualitativos que exige la autoridad competente y no se afecte la salubridad pública.

ARTICULO 112: Cuando las aguas residuales no puedan llevarse al sistema de alcantarillado, su tratamiento deberá hacerse de modo que no perjudique las fuentes receptoras, los suelos, la flora o la fauna. Las obras deben ser previamente aprobadas.

CAPITULO XX
DE LAS SANCIONES ADMINISTRATIVAS

ARTICULO 113: La violación de las normas que contiene este Código y las disposiciones que emanen de él, constituyen infracciones administrativas y serán sancionadas por la autoridad competente, con arreglo a lo dispuesto en este capítulo.

ARTICULO 114: Los infractores de las normas ambientales a que se refiere el artículo que antecede son sujetos pasibles de uno o más de las siguientes sanciones administrativas:

a) Multa no menor o media unidad impositiva tributaria y hasta 200 unidades impositivas tributarias vigentes a la fecha en que se cumpla el pago. En caso de internamiento de residuos tóxicos o peligrosos, la multa no será inferior al monto total de la transacción.
b) Prohibición o restricción de la actividad causante de la infracción.
c) Clausura parcial o total, temporal o definitiva, del local o establecimiento donde se lleva a cabo la actividad que ha generado la infracción.
d) Decomiso de los objetos, instrumentos o artefactos empleados para la comisión de la infracción.
e) Imposición de obligaciones compensatorias relacionadas con el desarrollo ambiental de la zona, teniendo en cuenta los planes nacionales, regionales y locales sobre la materia, a fin de dar cumplimiento a las normas de control ambiental que señale la autoridad competente.
f) Suspensión o cancelación de la licencia de funcionamiento, permiso, concesión o cualquier otra autorización según sea el caso.

ARTICULO 115: Las sanciones a que se refiere el presente capítulo serán aplicadas dentro del proceso administrativo correspondiente mediante resolución. La interposición de cualquier recurso, no suspenderá la ejecución de la resolución impugnada.

El plazo para impugnar judicialmente la resolución que agota la vía administrativa vence a los tres meses.

ARTICULO 116: Al calificar la infracción, la autoridad competente tomará en cuenta la gravedad de la misma, la condición socio-económica del infractor y su situación de reincidente, si fuera el caso.

ARTICULO 117: La responsabilidad administrativa establecida dentro del procedimiento correspondiente, es independiente de la responsabilidad civil o penal que pudiera derivarse de los mismos hechos.

ARTICULO 118: Para efectos de la aplicación de las normas de este capítulo, hay responsabilidad solidaria entre los titulares de las actividades causantes de la infracción y los profesionales que suscriban los estudios de impacto ambiental en los proyectos y obras que causaron el daño.

CAPITULO XXI

DE LOS DELITOS Y LAS PENAS

ARTICULOS 119: El que contraviniendo las leyes, reglamentos o disposiciones establecidas por la autoridad competente y con ocasión del funcionamiento de una industria o cualquier otra actividad, provoque o realice descargas, emanaciones, filtraciones o vertimientos contaminantes en la atmósfera, suelo, subsuelo o aguas que puedan causar perjuicios o alteraciones graves en la flora o fauna, los recursos hidrobiológicos o el ambiente en general, será reprimido con pena de prisión no mayor de tres años y multa de la renta de 500 a 750 días.

La pena será de prisión no menor de tres ni mayor de seis años y multa de la renta de 1,000 a 1,500 días:

a) Si la industria o la actividad funciona clandestinamente.
b) Si los estudios o informes técnicos concluyen que se produjo efectivamente un grave perjuicio en la flora o fauna, los recursos hidrobiológicos o el ambiente en general.
c) Si pone en grave peligro la salud pública.

En estos últimos casos, el Juez ordenará la clausura temporal o definitiva del establecimiento.

ARTICULO 120: Si se tratase de un funcionario o facultativo que informó favorablemente para el otorgamiento de la licencia a favor de la industria o actividad a que se refiere el artículo que antecede, en las condiciones causantes de la contaminación o del deterioro ambiental, cuando aquella sea manifiestamente contraria a las leyes, reglamentos o disposiciones establecidas por la autoridad competente, la pena será de prisión no menor de tres ni mayor de seis años e inhabilitación conforme al Artículo 27 inc. 1, 2 y 3 del Código Penal y multa de la renta de 500 a 1,500 días.

ARTICULO 121: El que internare en el territorio nacional residuos, desperdicios o cualquier otro material de desecho resultante de un proceso de producción, extracción, transformación, utilización o consumo, será reprimido con prisión no menor de uno ni mayor de cuatro años y multa de la renta de 500 a 750 días.

Las penas serán de prisión no menor de cuatro años ni mayor de seis, si los residuos o desechos internados tienen el carácter de tóxicos o peligrosos, conforme lo determine la autoridad competente.

ARTICULO 122: Si para el internamiento de residuos o desechos se valiera de documentos, certificados o declaraciones falsas referentes a la calidad, cantidad o destino de los mismos, el autor será reprimido con pena de prisión no menor de cuatro años ni mayor de ocho y multa de la renta de 1,000 a 1,500 días.

ARTICULO 123: Al funcionario o servidor público que participe en la comisión de los hechos declarados punibles en los dos artículos precedentes, se le impondrá, además, la pena de inhabilitación conforme al Artículo 27, inc. 1, 2 y 3 del Código Penal.

ARTICULO 124: El que deposita, comercializa o vierte desechos sólidos de origen urbano o industrial en lugares no autorizados o sin cumplir con las normas técnicas sanitarias respectivas, será reprimido con prisión no mayor de dos años y multa de la renta de 500 a 750 días.

La pena será de prisión no menor de dos años ni mayor de cinco y multa de la renta de 1,000 a 1,500 días, para el que contraviniendo las leyes, reglamentos o disposiciones establecidas, utilice los desechos sólidos para la alimentación de animales destinados al consumo humano.

ARTICULO 125: La caza, captura, pesca, o recolección de la fauna o flora silvestres sin la correspondiente autorización o efectuada fuera de la zona autorizada o en volúmenes superiores a los señalados en el contrato o permiso respectivo o utilizando medios prohibidos por la autoridad competente, así como la posesión, transporte, transformación, comercialización o exportación de sus productos, será reprimido con pena de prisión no mayor de tres años y multa de la renta de 500 a 750 días.

La pena será de prisión no menor de tres años y multa de la renta de 1,000 a 1,500 días, tratándose de especies amenazadas en vías de extinción.

ARTICULO 126: Aquel que contraviniendo las leyes, reglamentos o disposiciones establecidas por la autoridad competente altere, explote, queme, destruya, dañe o tale en todo o en parte bosques u otras formaciones vegetales, sean éstas naturales o cultivadas, dentro de un espacio o área natural protegida, será reprimido con prisión no mayor de dos años y multa de la renta de 500 a 750 días.

La pena sera de prision no menor de dos años y multa de la renta de 1,000 a 1,500 días, si se practica en áreas donde existen vertientes que provean de agua a algun centro poblado o a un sistema de irrigacion.

ARTICULO 127: Sera reprimido con pena de prision no mayor de tres años y multa de la renta de 500 a 1,000 días.

a) El que con fines de expansion urbana, construccion de viviendas u otros distintos a la actividad agropecuaria, utilice tierras ubicadas en areas agrícolas intangibles.
b) El que valiéndose de anuncios en el propio terreno o a través de medios de comunicación social u ofrezca en venta para fines urbanos u otro cualquiera, áreas agrícolas intangibles.

Cuando estos hechos fueran realizados por personas jurídicas, se impondrá la pena señalada, segun corresponda, a los representantes legales, directores, gerentes, administradores o encargados de la gestion empresarial que los hubieran autorizado y sin perjuicio de la responsabilidad civil que solidariamente corresponda a la persona jurídica infractora.

CAPITULO XXII
DEL SISTEMA NACIONAL DEL AMBIENTE

ARTICULO 128: El Sistema Nacional del Ambiente está integrado por todas

las instituciones estatales dedicadas a la investigación, evaluación, vigilancia y control de los recursos naturales y al medio ambiente y por los órganos y oficinas de los distintos ministerios y reparticiones publicas a nivel nacional, regional y local que desempeñen funciones similares. Por Decreto Supremo el Poder Ejecutivo determinara al ente coordinador del Sistema.

ARTICULO 129: El Sistema Nacional del Ambiente tiene por objeto coordinar la ejecución de la política nacional del ambiente y garantizar el cumplimiento de las funciones que la Ley asigna a cada una de las dependencias de los gobiernos nacionales, regionales y locales.

ARTICULO 130: Créase en la Contraloría General de la República una repartición especializada en la defensa del medio ambiente y de los recursos naturales, cuya función es velar por el estricto cumplimiento en todo el territorio nacional de las disposiciones referidas en el presente Código.

ARTICULO 131: Los funcionarios que ocupan cargos directivos, que se precisen en el reglamento, en las instituciones y órganos conformantes del Sistema Nacional del Ambiente sólo podrán ser removidos administrativamente de sus cargos con la anuencia de la Contraloría General de la República.

DISPOSICIONES ESPECIALES

ARTICULO 132: Declárase de interés social y nacional la preservación, conservación y uso sostenido de las tierras agrícolas de los valles circundantes de Lima Metropolitana y de las ciudades de más de doscientos mil habitantes del país, que han sido calificadas como intangibles en cumplimiento del D.S. 009-86-AG, que tiene fuerza de Ley.

Las Municipalidades están obligadas a respetar en sus planes de desarrollo, de acondicionamiento territorial y urbanos a las áreas agrícolas especiales, cuya intangibilidad deben cautelar.

La modificación del uso de las áreas agrícolas deberá ser declarada por ley nacional o regional para cada predio.

La instalación de los servicios de agua, luz, alcantarillado y otros en las zonas agrícolas especiales no implicarán cambio en su calificación ni estarán sujetos a los requisitos señalados por la legislación de la materia sobre terrenos urbanos.

ARTICULO 133: Se presumirá de pleno derecho, que se encuentran en estado de abandono las tierras en las áreas agrícolas, los predios o parte de éstos en los casos siguientes:

a) Cuando sean transferidos a cualquier título a favor de personas jurídicas cuyo objeto social y actividad principal no sea la actividad agropecuaria. Dichas transferencias son nulas de pleno derecho.
b) Cuando de dichos predios se extraiga tierra para fabricar ladrillos, adobes u otros productos no agrícolas.
c) Cuando se inicie obras de habilitación urbana, a través de hechos tales como el señalamiento de lotes, viviendas provisionales, anuncios, zanjas, depósito de materiales de construcción, u otros que impliquen obras de urbanización.

d) Cuando el uso del suelo se destine a fines distintos a la actividad agrícola. En tal caso, revertirá la parte que no se encuentre dedicada al cultivo.
e) Cuando las partes excedan el área permitida para las actividades complementarias.

El plazo para que no se produzca el abandono a que se refiere el primer acápite del Art. 8 del D.L. 17716 es de 6 meses consecutivos en las áreas agrícolas.

ARTICULO 134: Cuando la Municipalidad constatara de oficio o a pedido de cualquier persona, el inicio de habilitaciones urbanas para viviendas o actividades no agrícolas en las áreas agrícolas, ordenará mediante resolución municipal, la suspensión inmediata de las acciones, solicitará el embargo preventivo sobre los bienes que se encuentren en el terreno así como las demoliciones que resulten necesarias para preservar las áreas agrícolas intangibles. El Alcalde podrá solicitar el auxilio de la fuerza pública.

ARTICULO 135: Las solicitudes de autorización de urbanización de terrenos eriazos deberán ser resueltas dentro de los 30 días de presentadas, bajo responsabilidad del funcionario municipal correspondiente, siempre que la misma esté de acuerdo con el plan urbano y a las normas de habilitación vigentes.

ARTICULO 136: Modifícase los artículos 21º, 22º, 79º incisos 7) y 216 de la Ley General de Minería, Decreto Legislativo Nº 109 en el sentido que no podrá otorgarse derechos mineros de ninguna clase en las áreas agrícolas. Los derechos mineros concedidos incursos en las causales de abandono y caducidad serán declarados como tales, de oficio o a instancia de parte, por el simple mérito de la inspección ocular, careciendo de valor convalidatorio todo trabajo que se realice o haya realizado después de haberse constatado, invocado la causal. Asimismo, la autoridad competente declarará la nulidad del auto de amparo en todos los casos en que encontrándose los denuncios en áreas agrícolas intangibles según el D.L. Nº 21419, no se haya procedido de acuerdo con lo establecido en el Art. 8 de dicho Decreto Ley.

DISPOSICIONES FINALES

ARTICULO 137: Las acciones interpuestas en defensa del medio ambiente o cuya materia principal tiene dicho propósito, son ejercidas ante el juez del lugar donde se afectó el derecho o donde tiene su domicilio el accionante o el demandado.

ARTICULO 138. En los casos a que se refiere el artículo que antecede la excepción de incompetencia se resuelve con la sentencia. La contienda de competencia no puede ser planteada cuando se señala expresamente en la demanda que la acción interpuesta se ejerce en defensa del ambiente y los recursos naturales o cuya materia principal tiene tal propósito.

ARTICULO 139: Agréguese al artículo 31 de la Ley 23506, modificado por el artículo 1º de la Ley 25011, los siguientes párrafos:

"Artículo 31.– (...) "Si la solicitud está referida a actos que generan o pueden provocar daños al ambiente, sus ecosistemas, o sus componentes esenciales, la resolución que ordene la suspensión de los mismos sólo será apelable en efecto devolutivo.

En los casos a que se refiere el párrafo anterior, el juez podrá disponer la suspensión de los actos que se estén produciendo como consecuencia de la omisión de otros de cumplimiento obligatorio, aún cuando la demanda sólo se refiera a este último supuesto"

ARTICULO 140: Agréguese al artículo 26 de la Ley 23506 el siguiente párrafo:

"Artículo 26.– (...) "Cuando la acción se interponga por violación o amenaza de violación de derechos constitucionales de naturaleza ambiental, podrá ser ejercida por cualquier persona, aún cuando la violación o amenaza no lo afecte directamente. Igual atribución tienen las organizaciones no gubernamentales sin fines de lucro cuyo objeto es la defensa del medio ambiente"

ARTICULO 141: En las acciones de abuso del derecho que sean interpuestas al amparo del artículo II del Título Preliminar del Código Civil y se refieran a la tutela de derechos de naturaleza ambiental, las medidas preventivas dictadas para evitar o suprimir el abuso sólo podrán ser apelables en efecto devolutivo.

ARTICULO 142: Los Convenios de Conversión de Deuda Pública Externa en Donación regulados por el Decreto Supremo 80-89-EF, al que se reconoce fuerza de ley, destinados a proyectos de desarrollo agrario, conservación del medio ambiente y recursos naturales, educación ambiental e investigación y ciencia y tecnología relacionadas al medio ambiente, podrán ser celebrados por la entidad donante, la entidad beneficiaria, nacional y el Estado, cuando los títulos de deuda pública materia de la operación sean adquiridos por la entidad donante en el mercado secundario.

ARTICULO 143: A partir de la vigencia de este Código sus disposiciones serán aplicadas inclusive a las consecuencias de las relaciones y situaciones jurídicas existentes.

ARTICULO 144: Derógase el Art. 25º del Decreto Legislativo 495.

ARTICULO 145: Derógase el Decreto Ley Nº 21110 y la Ley Nº 24994.

DISPOSICIONES TRANSITORIAS

PRIMERA: Las personas naturales o jurídicas que resultaren comprendidas en los alcances de este Código, deben adecuarse a sus exigencias en un plazo no mayor de 180 días contados a partir del día de su publicación.

SEGUNDA: La Ley Forestal y de Fauna Silvestre, expedida mediante Decreto Ley Nº 21147 del 13 de mayo de 1975, será actualizada en concordancia con el presente Código en el plazo máximo de 60 días calendarios.

TERCERA: El Poder Ejecutivo reglamentará las disposiciones especiales de este Código en un plazo máximo de 60 días a partir del día de su publicación.

Appendix IV. Peru Pesticide Import and Registration Requirements

MINISTERIO DE AGRICULTURA
SERVICIO NACIONAL DE SANIDAD AGRARIA

(SENASA)

PERU

PLAGUICIDAS AGRICOLAS Y SUSTANCIAS AFINES REGISTRADAS EN EL MINISTERIO DE AGRICULTURA

Setiembre 1,993

Declaran de Libre Comercialización Interna y Externa de Plaguicidas Agrícolas y Sustancias Afines

DECRETO SUPREMO Nº 0027-91/AG

EL PRESIDENTE DE LA REPUBLICA

CONSIDERANDO :

Que por Decreto Supremo Nº 060-91-EF del 23 de Marzo de 1,991, se deja sin efecto todas las restricciones de carácter administrativo preservando los de orden sanitario, conservación y protección de la flora y fauna nacionales :

Que es objetivo del gobierno la simplificación de los trámites relativos al comercio exterior sin perjuicio de las acciones de control de la importación y registro de plaguicidas agrícolas y sustancias afines que ingresen al país;

En uso de la facultad conferida por el inciso 11) del artículo 211º de la Constitución Politicia del Perú;

DECRETA :

Artículo 1º.- Declárese la libre comercialización interna y externa de plaguicidas agrícolas y sustancias afines los mismos que estarán sujetos únicamente a lo dispuesto en el presente Decreto Supremo.

Artículo 2º.- Para la obtención del Registro de Plaguicidas y Sustancias Afines no será exigible por las autoridades y/o dependencias del Ministerio de Agricultura otros documentos, registros o trámites que los señalados a continuación:

Certificado de Análisis Físico Químico y de Toxicidad Biológica del Uso de Productos que estarán acordes con los rangos indicados en el Anexo 1, siguiendo la metodología establecida por ITINTEC, tratándose de productos nacionales.

Certificado Oficial de Libre Comercialización otorgado por el país de origen o Constancia Certificada del país de origen que acredite que el uso del producto está probado y autorizado para los fines que se recomienda; tratándose de productos importados.

Para la identificación del solicitante sólo será necesario el número correspondiente al Registro Unificado establecido por las normas de simplificación administrativa.

Dicho registro será exclusivamente para el producto no debiendo figurar en él, nombre de empresa o persona alguna, y tendrá una vigencia de 5 años, vencido el cual podrá ser renovado. Una vez inscrito el producto, este podrá ser importado por cualquier persona natural o jurídica.

De suspenderse la libre comercialización en el país de origen de un producto registrado, su vigencia caducará automáticamente. Para tal efecto, el Ministerio de Agricultura publicará periódicamente la relación de productos con registro vigente.

Artículo 3º.- Las solicitudes de Registro de Plaguicidas Agrícolas y Sustancias Afines se resolverán en un plazo no mayor de 15 días contados desde su presentación, vencido el cual se considerará registrado el producto en forma automática. El Ministerio de Agricultura publicará, mensualmente a través de la Dirección General correspondiente y bajo responsabilidad, los registros efectuados en el periodo.

Artículo 4º.- A fin de facilitar la labor de registro y control de calidad realizado por el Ministerio de agricultura, este organismo queda autorizado a cobrar una tarifa por Registro de Plaguicidas Agrícolas y Sustancias Afines que no podrá exceder del cinco por ciento (5%) de la Unidad Impositiva Tributaria (UIT) vigente en el mes anterior al de la solicitud del registro, por cada producto.

Las Plaguicidas Agrícolas y Sustancias Afines que cuente con Registro, deberán proceder a su reinscripción en el plazo máximo de treinta (30) días contados a partir de la vigencia del presente dispositivo.

Artículo 5º.- El Protocolo de Análisis del producto podrá ser realizado por la Estación Experimental La Molina o por otras estaciones experimentales, universidades, empresas especializadas, laboratorios, centros de investigación o profesionales especializados, interesados en la emisión de los mismos, debiendo el Ministerio de Agricultura en el plazo máximo de 7 días de presentada la solicitud correspondiente, calificarlos y aprobarlos, de ser el caso.

Artículo 6º.- La importación de Plaguicidas Agrícolas y/o Sustancias Afines, se sujetará únicamente a la presentación de la Declaración Jurada a que se refiere el anexo 2 del presente Decreto Supremo, la misma que deberá ser presentada a la Dirección General de Agricultura. Una copia de dicho documento se hará llegar a la Aduana de Despacho correspondiente.

Artículo 7º.- Los Plaguicidas Agrícolas y Sustancias Afines deberán presentar obligatoriamente para su comercialización interna, etiquetas o rótulos redactados en idioma español debidamente impresos, siguiendo las normas que se establecen en el Anexo 4 del presente Decreto Supremo.

Artículo 8º.- El Ministerio de Agricultura realizará pesquisas para determinar que los Plaguicidas Agrícolas y Sustancias Afines, nacionales e importados, se ajustan a las características especificadas en las etiquetas correspondientes, elaboradas de conformidad con el Anexo 3 del presente Decreto Supremo.

Artículo 9º.- Derógase el Decreto Supremo No. 164-82-AG, modificatorias y complementarias, así como todas las disposiciones que se opongan a lo dispuesto en el presente Decreto Supremo.

Artículo 10º.- El presente Decreto Supremo entrará en vigencia el día de su publicación y será refrendado por el Ministerio de Agricultura.

Dado en la Casa de Gobierno, en Lima, a los diecisiete días del mes de junio de mil novecientos noventa y uno.

ALBERTO FUJIMORI FUJIMORI
Presidente Constitucional de la República

ENRIQUE ROSSL LINK
Ministro de Agricultura

ANEXO 1

TOXICIDAD Y VARIACIONES PERMISIBLES EN EL CONTENIDO DEL PRINCIPIO ACTIVO

La clasificación toxicológica se determina según la dósis letal media (D.L./50) aguda oral y dérmica, expresada en mg/kg de peso vivo, del producto comercial.

Según el estado físico de las formulaciones comerciales, se asume la clasificación aprobada por el Acuerdo de Cartagena, en Colombia el 23/27 Agosto 1,982, agrupando los plaguicidas agrícolas y sustancias afines en los cuatro (4) grupos siguientes, según el D.L./50 (rtas mg/kg peso).

CLASES	TOXICOLOGIA ORAL		TOXICOLOGIA DERMAL	
	SOLIDOS	LIQUIDOS	SOLIDOS	LIQUIDOS
I. EXTREMADAMENTE TOXICO	5 ag/kg o menor cantidad	20 ag/kg o menor cantidad	10 ag/kg o menor cantidad	40 ag/kg o menor cantidad
II. ALTAMENTE TOXICO	Has de 5 ag/kg hasta 50 ag/kg	Más de 20 ag/kg hasta 200 ag/kg	Más de 10 ag/kg hasta 100 ag/kg	Más de 40 ag/kg hasta 400 ag/kg
III. MODERADAMENTE TOXICO	Más de 50 ag/kg hasta 500 ag/kg	Más de 200 ag/kg hasta 2.000 ag/kg	Más de 100 ag/kg hasta 1.000 ag/kg	Más de 100 ag/kg hasta 4.000 ag/kg
IV. LIGERAMENTE TOXICO	Más de 500 ag/kg	Más de 2.000 ag/kg.	Más de 1.000 ag/kg	Más de 4.000 ag/kg.

Contenido en Materia Activa:	Variación Permitida:
Del 50% o más	+/- 4%
Del 25% al 49.99%	+/- 5%
Del 10% al 24.99%	+/- 6%
Del 2.51% al 9.99%	+/- 10%
Del 0% al 2.5%	+/- 15%

ANEXO - 2

MODELO DE DECLARACION JURADA PARA LA IMPORTACION DE PLAGUICIDAS AGRICOLA Y SUSTANCIAS AFINES

DECLARACION JURADA - D.S. Nº .....

Yo, ..., con L.E Nº ....., en representación de la Empresa ....., con L.T Nº ....., Declaro bajo juramento ante la Dirección General de Agricultura, que la información que a continuación se detalla es verídica :

1. Nombre Comercial del Producto.....
2. Nombre común del ingrediente. .....
   Activo.....Grupo.....
3. Clase.....Formulación.....
4. DL 50 Oral.....DL 50 Dermal.....
5. País de origen del producto.....
6. Uso del producto : Cultivos.....
7. Peso Neto :.....
8. Peso Bruto :.....
9. Número de Registro Unificado de la Empresa Importadora :....
10. Número de Registro del Producto :.....
11. Valor FOB en moneda extranjera :.....
12. Valor CIF :.....
13. Medio de Transporte :.....
14. Puerto de embarque y/o puesto fronterizo.....
15. Puerto de desembarque y/o puesto fronterizo.....
16. Fecha de embarque.....
17. Fecha de arribo.....
18. Fecha de Producción.....
19. Fecha de Expiración.....

Asimismo, declaro que el producto se ajusta a las normas vigentes sobre plaguicidas agrícolas y sustancias afines; por tanto me someto a las consecuencias de orden jurídico-técnico-administrativo por el incumplimiento, o inexactitud o falsedad de lo enunciado.

Lugar y Fecha

.....
Nombre y Firma

ANEXO 3

REQUISITOS PARA EL ETIQUETADO DE PLAGUICIDAS AGRICOLAS Y SUSTANCIAS AFINES

Las etiquetas que llevarán los plaguicidas agricolas y sustancias afines, en cualquiera de las presentaciones de envases (estructura), conservarán las proporciones de alturas que aqui se indican y las caracteristicas de un diagramado simple, información clara, grabación de elementos gráficos de seguridad (pictogramas), logotipo caracteristico de la Marca de Fábrica banda de color según niveles de toxicidad. Todos estos ele-mentos necesarios para la mayor facilidad de identificación por los usuarios.

Los elementos esenciales de las etiquetas antes descritas son :

1. Marca de Fábrica o nombre comercial.
2. Nombre técnico del principio activo entre paréntesis, en tamaño inferior a un tercio del tamaño de la marca de fábrica.
3. Tipo de formulación del producto y clase de plaguicida.
4. Composición quimica de los compuestos, expresados para productos sólidos en porcentajes (%) de peso de cada ingrediente, y para productos liquidos en gramos por litro de cada ingrediente.
5. Nombre del fabricante y del pais de origen.
5. Nombre del importador y/o distribuidor con indicación de la dirección, teléfono, fax.
7. Nº de Registro del Producto
8. Contenido Neto
9. Nº de Lote
10. Fecha de Expiración.
11. Cuerpo de texto con contenidos sobre :
    Precauciones; Primeros Auxilios; Nota al Médico con precisión del Antidoto; indicación si es explosivo, inflamable, corrosivo.
12. Cuerpo de Texto Informativo con : Indicativos de uso; Sistemas de preparación y aplicación; Cuadro de Dosificaciones.
13. Banda de color variable, según los niveles de toxicidad, de un tamaño relativo al 15% de la misma etiqueta, circundando la parte inferior de la misma : COLOR ROJO con la gráfica del pictograma EXTREMADAMENTE TOXICO-VENENO y una calavera con dos tibias cruzadas y; COLOR AMARILLO FUERTE con la gráfica del pictograma ALTAMENTE TOXICO-VENENO y una calavera con dos tibias cruzadas y; COLOR AZUL con la gráfica del pictograma y MODERADAMENTE TOXICO-CUIDADO; y COLOR VERDE, con la gráfica del pectograma LIGERAMENTE TOXICO PRECAUCION.

En las etiquetas, no se aceptará la inscripción de frases publicitarias, fotografias o dibujos distintos a los aqui señalados, que pudieran significar motivos propagandisticos.

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Precisan que lo Dispuesto en el Articulo 1º del D.S. Nº027-91-AG, No Comprende a los Plaguicidas Organoclorados

DECRETO SUPREMO Nº 037-91-AG

EL PRESIDENTE DE LA REPUBLICA

CONSIDERANDO :

Que, por Decreto Supremo Nº 027-91-AG, se declara, libre comercialización interna y externa de los plaguicidas agricolas y sustancias afines, preservando las restricciones de orden sanitario, conservación y protección de la Flora y Fauna Nacional;

Que, la libre comercialización tiene como objetivo la simplificación en los trámites relativos al Comercio Exterior sin perjuicio de las acciones de Control de la importación y registro de Plaguicidas Agricolas y Sustancias Afines, que ingresan al pais por lo que es necesario precisar los alcances del citado Decreto Supremo;

De conformidad con lo dispuesto por el Articulo 21º, inciso 11) de la Consitución Politica del pais, y articulo 4º del Decreto Legislativo 565 - Ley de Organización y Funciones del Sector Agrario;

DECRETA :

Articulo 1º.- Precisase que lo dispuesto en el Articulo 1º del Decreto Supremo Nº 027-91-AG, no comprende a los Plaguicidas Organoclorados que a continuación se detallan, asi como sus derivados y compuestos que con ellos se puedan formular quedando prohibida su importación y registro en el pais :

- **ALDRIN**
  1, 2, 3, 4, 10, 10 - Hexacloro - 1, 4a, 5, 8, 8a - Hexahydro - 1, 4, 5, 8 - Dimetanonaftaleno.

- **ENDRIN**
  (1R, 4S, 5R, 8S) - 1, 2, 3, 4, 10, 10 Hexachloro - 1, 4, 4a, 5, 6, 7, 8, 8a - Octahydro - 6, 7 Epoxy - 1, 4, 5, 8 - Dimethanonaftaleno.

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DIELDRIN
(1R, 4S, 5R, 8S) - 1, 2, 3, 4, 10, 10 - Hexachloro - 1, 4, 4a,5, 6, 7, 8, 8a - Octahydro - 6, 7 - Epoxy - 1, 4: 5, 8 - Dimethanonaftaleno.

BHC/HCH
1, 2, 3, 4, 5, 6 - Hexaclorociclohexano y sus Isómeros Alfa, Beta y Delta.

CANFECLORO/TOXAFENO
Derivado de Octacloro de 1, 2 - Dimetileno.

HEPTACLORO
1, 4, 5, 6, 7, 8, 8 - Heptacloro - 3a, 4, 7, 7a - Tetrahydro - 4, 7 Methanoindene.

2, 4, 5 - T
2, 4, 5 - Acido Triclorofenoxiacético.

Artículo 2º.- El plazo para retirar del mercado los plaguicidas a que se refiere el Artículo 1º vence el 31 de Mayo de 1,992.

Artículo 3º.- Se cancelan los registros y se prohibe al DDT, diclorodifenitricloro etano, sus derivados y compuestos para todo uso agrícola.

Artículo 4º.- Los plaguicidas arsenicales serán utilizados para el control de plagas en el cultivo del algodonero, en tanto se aprueban los sustitutos correspondientes.

Artículo 5º.- En el caso de Hexaclorociclohexano (HCH), se exceptúa de esta prohibición el isómero gamma.

Artículo 6º.- Transcribir el presente Decreto Supremo, a la Superintendencia Nacional de Aduanas, para los fines pertinentes.

Artículo 7º.- El presente Decreto Supremo será refrendado por el Ministro de Agricultura.

Dado en la Casa de Gobierno, en Lima a los doce días del mes de Setiembre de Mil novecientos noventiuno.

ALBERTO FUJIMORI FUJIMORI
Presidente Constitucional de la República

ENRIQUE ROSSL LINK
Ministro de Agricultura

AGRICULTURA

Constituyen Comisión Nacional de Plaguicidas con Carácter Permanente

RESOLUCION MINISTERIAL Nº 0250-93-AG

Lima, 15 de Julio de 1,993

CONSIDERANDO :

Que, la Constitución Política del Perú en sus Artículos 15º y 17º, determina los derechos y deberes de participación ciudadana en defensa de su salud, así como faculta al Estado a reglamentar y supervisar la producción, calidad, uso y comercio, de los productos químicos, entre otros;

Que, el Código del Medio Ambiente y los Recursos Naturales, aprobado mediante Decreto Legislativo Nº 613, establece la obligación del Estado a proteger y conservar los ecosistemas y determina la prohibición implícita a la importación de productos químicos que no hayan sido previamente autorizados por la autoridad del Sector competente;

Que, por Decreto Supremo Nº 060-91-EF, se deja sin efecto todas las restricciones de carácter administrativo, preservando aquellas de orden sanitario, conservación y protección de la flora y fauna nacionales, las cuales de acuerdo a lo dispuesto por el Decreto Legislativo Nº 682, se rigen por sus propias Normas o dispositivos específicos;

Que, la libre comercialización interna y externa de los plaguicidas agrícolas y sustancias afines, dispuesta por el Decreto Supremo Nº 0027-91-AG, está ocasionando el comercio sustancias de dudosa fabricación e incluso adulteración y contrabando, en desmedro de la economía del agricultor y de la eficacia en el control fitosanitario de las plagas y enfermedades que atacan a los cultivos;

Que, una de las recomendaciones emanadas en el Seminario Taller "Aplicación del Código Internacional de Conducta para la distribución y utilización de plaguicidas en el Perú", organizado por el Ministerio de Agricultura y auspiciado por la Organización de las Naciones Unidas para la Agricultura y la Alimentación (FAO), fue la de conformar una Comisión Nacional de Plaguicidas de carácter perma-

tente, interdisciplinaria y multisectorial, recomendación que hace suya el Servicio Nacional de Sanidad Agraria;

De conformidad con lo dispuesto por el Decreto Ley Nº 25902 - Ley Orgánica del Ministerio de Agricultura;

SE RESUELVE:

Artículo 1°.-Constitúyase la **COMISION NACIONAL DE PLAGUICIDAS** con carácter permanente, orientada a revisar, analizar y proponer alternativas al registro, uso y manejo de los plaguicidas agrícolas en el país.

Artículo 2°.- La Comisión Nacional de Plaguicidas estará integrada por:

- Dos representantes del Servicio Nacional de Sanidad Agraria, uno de los cuales lo presidirá.
- Un representante del Instituto Nacional de Recursos Naturales
- Un representante de la Dirección General de Salud Ambiental
- Un representante de la Universidad Peruana
- Un representante de la Sociedad Entomológica del Perú
- Un representante del Comité de Plaguicidas (COPLACAN) de la Cámara de Comercio de Lima.

Artículo 3°.- La designación de los integrantes de la Comisión nacional de Plaguicidas se efectuará de Oficio para el Sector Estatal, por designación de la Asamblea de Rectores para el representante de la Universidad Peruana y por delegación acreditada, tanto para el representante de la Sociedad Entomológica del Perú, como para el representante del Comité de Plaguicidas.

Artículo 4°.- La Comisión deberá instalarse y aprobar su Reglamento Interno, en un plazo de 30 días contados a partir de la publicación de la presente Resolución.

Artículo 5°.- La Comisión Nacional de Plaguicidas, entre sus funciones, priorizará la elaboración de una nueva legislación que norma la importación, producción, comercialización, registro y control de plaguicidas agrícolas y sustancias afines adecuándola a la actual política agraria del país.

Artículo 6°.- Los Organismos Públicos y demás Instituciones involucradas con los fines de la Comisión Nacional de Plaguicidas, están obligados a prestar las facilidades del caso, para el cumplimiento de los objetivos propuestos. De ser necesario se conformarán equipos técnicos especializados que contribuyan a su eficiencia y óptimo nivel científico.

Regístrese y Comuníquese.

ABSALON VASQUEZ VILLANUEVA
Ministro de Agricultura

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