FINAL REPORT

## VOLUME III SUPPORTING REPORT

### L. INSTITUTION AND ORGANIZATION

### STUDY ON INTEGRATED WATER RESOURCES DEVELOPMENT IN THE CAÑETE RIVER BASIN IN THE REPUBLIC OF PERU

#### FINAL REPORT VOLUME III SUPPORTING REPORT

#### L: Institution and Organization

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#### Chapter 1 Institutional Aspects and Organizations

#### **1.1 Current Institutional Framework**

#### 1.1.1 Legislative and Regulatory Framework for Development and Management

The use of water in Peru is determined by the 1969 General Water Law. The 1969 General Water Law repealed a 1902 Law in which water rights are privately owned but given in conjunction with land rights. The current Law stipulates that all water resources belong to the State. The Water and Sanitation Service Law enacted in 1994 provides framework for water and sanitation service. The major provisions on water resources development and management are prescribed below.

#### (1) Priorities of Water Use

Water use is subject to social and economic development needs. Priorities of water use is prescribed in the following order:

- 1) For human consumption and basic necessities;
- 2) For animal breeding and exploitation;
- 3) For agriculture;
- 4) For energy, industry and mining sectors; and
- 5) For other uses
- (2) Water Right

Ministry of Agriculture is responsible for water resources allocation for both surface and groundwater. The allocation is made by granting 1) licenses for permanent uses, 2) permits for temporary use of excess water and in agriculture for annual crops, and 3) special authorization for the implementation of specific studies and works. Groundwater investments like construction of wells on private property do not require any permission from the State. Licenses and permits are revoked or declared null and void when: a) the use of water is transferred to other parties or differs from that originally prescribed, b) the water tariff has not been paid for two consecutive years, and c) water is not used according to the cropping and irrigation plans.

#### (3) Water Tariff

Ministry of Agriculture establishes the water tariff. There are two types of water tariffs, one for agricultural use, and the other for non-agricultural use. In agricultural use, the tariff has the three components:

• Water user association component (ingresos junta de usuarios) for O&M expenses and to finance the operation budget of the Technical Administrator (Administrator Tecnico);

- Water levy component (canon de agua) representing 10% of water user association component;
- Amortization component (obras de regulacion) to cover the cost of public investment in storage structures. It represents only 10% of water user association component except when otherwise determined by "special" project proposals.

Agricultural water tariffs are proposed by the Technical Administrator to the water user association (WUA). In addition, special water levies (*cuotas*) are collected by the WUA or Irrigation Commission from the water users for specific works or activities in the irrigation system or sub-system.

Tariff for non-agricultural water use consists of the two components:

- General Directorate of Water and Soil Component (*Ingresos Direccion General*) is collected for the activities of General Directorate of Water and Soils (DGAS) and National Program for River Basin Management and Soil Conservation (PRONAMACHS) of Ministry of Agriculture; and
- Water levy component (*Canon de Agua*) is paid to the Public Treasury as incomes of the Republic
- (4) Water and Sanitation Supply

The Constitution of 1993 stipulated that water and sanitation services are responsibility of local government. The Water and Sanitation Services Law defined for responsibilities for service provision. It also affirmed transparent, financially viable and social equity as basic principles for tariff setting. In case SEDAPAL wishes to increase their tariffs, the approval from SUNASS is required. The Water and Sanitation Services Law also established a framework for private sector participation for water supply and sanitation.

#### (5) Draft Water Resources Law

While the institutional framework affirmed in the General Water Law of 1969 seems to be rational, the Ministry of Agriculture has come to realize that some reforms are required due to the political and economic situation changes. Because of the tight fiscal policy, little public spending was made in the beginning of the 1990's. Water delivery became irregular and water quality deteriorated. Water conflicts among agricultural and the various users grew. The Peruvian Government requested the assistance from the World Bank and the Inter-American Development Bank (IDB) to understand other countries' experience with water resources management. The Peruvian Government was interested in the 1981 Chilean Water Law. The Ministry of Agriculture drafted this new water law several years ago. Some stakeholders oppose to this draft because of insufficient participation at design stage, lack of dissemination of draft at the early stage. The oppositions are mostly from those who oppose to the current administration's

market oriented reforms. Essential characteristics of the draft law are described below.

1) Scope of the law and water rights

The law deals of the use, preservation and conservation of water either surface or groundwater. While water is a national asset, the right to use it is properties right to hold or use it in an exclusive manner and designate it for any purposes, as stipulated by law. There are no priorities among water rights for different rights. The water rights are for consumptive use and for non-consumptive use, temporary or permanent use. Holders of consumptive rights do not need to have the water returned to the river system. Holders of non-consumptive rights must return the same quantity of water to the river system. Water rights are given by the Watershed Director. The water right is recorded in a special public registry (Public Registry of Water Rights). The water right is separate from the land right for both surface and groundwater.

2) Water sector administration

Water distribution under established water rights is to be made by the various types of Water Users Organizations (WUOs). WUOs include Water Users Association (*junta de usuarios*) with jurisdiction over a river basin, and canal commission with jurisdiction over canals and other hydraulic works. WUOs are required to perform hydrological measurements and protection of riverbanks and riverbeds.

The National Water Council (*Consejo Nacional de Aguas*) is to be established. The Council is a decentralized agency of the Ministry of Agriculture. The Council has technical, economic, budgetary and administrative autonomy. It is comprised of the representatives of the Ministries of Agriculture, the Presidency, Energy and Mines, Industry, Tourism, Integration and Trade, Health, and Economy and Finance.

3) Watershed bureaus

Five National Watershed Bureaus are created with jurisdictions over the following watersheds and hydrographic basins:

- Amazon River Basin Bureau (headquarters in Iquitos);
- Lake Titicaca Basin Bureau (headquarters in Puno);
- Sierra (highland) and Costa Norte (northern coastal) Basins Bureau located between the Zarumilla and Culebras Rivers (headquarters in Chiclayo);
- Sierra and Costa Central (central coastal) Basins Bureau located between the Huarmey and Ica Rivers (headquarters in Lima);
- Sierra and Costa Sur (southern coastal) Basins Bureau, located between the Grande and Caplina Rivers

The Watershed Director is responsible for 1) establishing the original water rights, 2) authorizing the transfer of water from one watershed to another, and 3) authorizing the construction or modification of intakes, dams or any other works in riverbeds.

4) Tradable water rights

After the water right is given to various water users – farmers, water supply and sanitation enterprises, industrial users and hydropower generation enterprises -, they can buy and sell the rights in the open market at a price determined by supply and demand. They can also lease the rights. In addition to the price of the rights, purchasers will have to pay the cost of any changes to infrastructure to effect the transfer as well as compensation to any injured parties. The sale price does not have to be the same as the water tariff to ensure operation and maintenance of the system. If farmers are able to sell their water rights at freely negotiated prices, some farmers will choose to generate extra income by selling any surplus rights. They can also switch to high value crops.

River administration envisaged in the draft Water Resources Law can be illustrated as Figure 1.1 River Administration envisaged in the draft Water Resources Law.

#### 1.1.2 Organizations for Water Resources Development and Management

There are several government agencies involved in water resources development and management in Peru. The tasks assigned to the organizations - both governmental and private - are summarized in Table 1.1 "Summary of tasks of the organizations related to water resources development and management". The Table shows various tasks related to water resources development and management. Functions of water resources development and management are categorized as follows:

- Dc : Data Collection
- Pl : Planning
- OM : Operation and Maintenance
- Mo : Monitoring
- Re : Regulatory
- Coo : Coordination
- I : Implementation

Functions of an organization change according to its work duty or task. Hence, organization functions as an implementing agency for a task while the same organization functions as a coordinating agency for other tasks. This Table was prepared after discussion with Ministry of Agriculture and SEDAPAL.

(1) Water Resources Development (Surface and Groundwater)

Ministry of Agriculture (MAG) has the primal responsibility for water sector planning and regulatory tasks. In MAG, General Directorate for Water and Soils (DGAS: *Direccion General de Aguas y Suelos*) is the principle agency responsible for water sector. Technical Administrator for Irrigation District (ATDR) under DGAS is responsible for planning and regulatory tasks at local level.

National Institute of Development (INADE) has been in charge of planning and implementation of the large hydraulic projects. There are 10 on-going projects in Coastal area (Costa).

Domestic water and industrial water supply development are implemented by water and sanitation service companies.

Electricity companies implement hydropower generation project. Some industries and commercial enterprises often use their own groundwater resources. In all cases, water right shall be obtained from the Ministry of Agriculture.

(2) Water Resources Management (Water Allocation and Balance)

Water resources management has been the responsibility of the General Directorate of Water and Soils (DGAS), National Institute of Natural Resources (INRENA) at national level.

National Service for Meteorology and Hydrology (SENAMHI) is the agency designated by the Regulation issued for the General Water Law, to collect hydrological data - Data collection - throughout the country.

The 1991 Agricultural Investment and Promotion Law established regional inter-agency basin entities. Autonomous Hydrographic Basin Authorities (*Autoridad Autonoma de la Cuenca Hidrografica*; AACH) were established in the following five river basins: Jequetepeque, Chancay-Lambayeque, Chira-Pinra, Chillon-Rimac-Lurin, Santa-Lacramarca.

AACH is established in river basins where intensive and multi-sector use of water exists. It is supposed to act as the decision making instrument on the use and conservation of water.

AACH is responsible for formulating master plans for the management of natural resources and implementing irrigation and conservation activities in the basin. AACH consists of Technical Administrator, the representatives of the local governments, the Ministry of Energy and Mines, the Ministry of Transport and Communication, National Institute of Development (INADE) and five representatives of producer groups. AACH has been established in the bigger river basins with multiple water users.

At local level, responsibility for irrigation and other water uses rests with a Technical Administrator (ATDR) appointed by the Ministry of Agriculture. The Technical Administrator has the following functions:

- ensure the rational and efficient use of water resources;
- approve cropping and irrigation plans and supervise their implementation;
- authorize and approve the studies and infrastructure construction associated with requests for licenses and permits for water;
- issue water licenses and permits;
- approve and keep water use registers up to date;
- establish, modify or cancel water rights;
- impose restrictions on water use for conservation purposes;
- resolve conflicts among water users;
- support and approve the creation of water user associations;
- propose and set water tariff levels; and
- approve plans for the O&M of the irrigation systems.

#### (3) Agricultural Water Supply

The Technical Administrator oversees irrigation districts (*distrito de riego*) and Water User Association (*Junta de Usuaridos or Organizacion de Usuarios de Agua*; WUA). There are 64 irrigation districts in Peru. Water User Association is comprised of agricultural water users. Only one WUA exists in each irrigation district. In addition to the WUA, there are commissions and committees organized in the irrigation districts.

#### (4) Domestic and Industrial Water Supply

National Service for Domestic Water and Sanitation (SENAPA, *Servicio Nacional de Agua Potable y Alcantarillado*) provided water supply and sanitation services in rural areas until 1989. The Ministry of Health provided the services in rural areas. Domestic water supply and sanitation services were decentralized in 1989. Responsibilities for provision of the services were transferred to local governments. SENAPA was then abolished in 1992. The Ministry of Presidency assumed the role of supervision of the services. Currently there are 45 water supply and sanitation service companies including SEDAPAL - for Lima and Callao - in Peru. In areas where no water supply and sanitation company exists, the services are provided directly under provincial government. National Superintendence of Sanitary Service (*SUNASS: Superintendencia Nacional de Servicios de Saneamiento*) was established in 1994 for supervision of water and sanitation sector. SUNASS has regulatory function and it is financed from 2% of water and sanitation service companies' revenues.

Most water supply and sanitation companies other than SEDAPAL – those operated under the provincial governments – have not generated net income. There is a

draft law, which proposes several management improvement plans for 44 loss-making water supply and sanitation. The draft is under discussion as of November 1999.

Organization chart of SEDAPAL is shown in Figure 1.2. SEDAPAL has the following departments: Human Resources, Finance, Logistics and Service, Development and Study, Projects and Works, Production and three regional management service: North Services including Callao, Central Service, and South Service. There are approximately 1,600 personnel in SEDAPAL. SEDAPAL has taken several restructuring measures in the past few years. Such measures included increase in water tariff, rehabilitation of its service system, and reduction of employees. SEDAPAL's performance has improved in the several years due to such measures. As of December 1997, SEDAPAL has 1.87 workers per 1,000 connections. In case of Japan, this ratio is around 1.7 per 1,000 connections.

As regards industrial and commercial water use, their water rate is higher than the one for social and domestic water users. Thus, the water rate subsidizes social and domestic water uses. This cross-subsidies do not contribute to efficient resource allocation. Industrial and commercial enterprises often use their own groundwater resources to avoid paying high rates. For example in SEDAPAL's rate, while industrial rate and commercial rate are 2.60 Soles/m<sup>3</sup> (0.8US\$<sup>1</sup>), domestic rate is 0.935 Soles/m<sup>3</sup> (0.3US\$) and social rate is 0.72 Soles/m<sup>3</sup> (0.2US\$).

#### (5) Hydro Power Generation

General Directorate of Electricity of Ministry of Energy and Mining (MEM) is responsible for hydropower generation sector in Peru.

After 1990, the role of the state for electricity was redefined. Before 1990, the state was responsible for promotion, investment, administration, regulation, and control for electricity service. Currently the Ministry of Energy and Mining (MEM) promotes the policy to have private sector to be in charge of power generation, transmission, and generation. Electricity is one of the leading sectors in privatization of state-owned enterprises. Law for Electricity Concession was promulgated in 1992. There are some projects already operated by private sector. However, the Ministry of Energy and Mining suspended the process of electricity concession application since September 1998. It is not clear when this process will resume.

#### (6) Flood Control

National Institute for Civil Defense (INDECI:*Instituto Nacional de Defensa Civil*) is the agency responsible disaster management operation. In Peru as well as disaster management operation is described in the disaster management cycle:

<sup>&</sup>lt;sup>1</sup> The exchange rate of 1US = 3.3 Soles is applied.

disaster prevention, preparation, emergency operation, rehabilitation, and reconstruction. INDECI is responsible for before disaster stage until the emergency operation and to some extent to rehabilitation. INDECI had implemented some river protection works in the past. Their current attention is mostly drawn to earthquake. They are now developing warning system for earthquake. Their tasks are mostly on emergency rescue and awareness raising on disaster.

National Institute for Development (INADE: *Instituto Nacional de Desarrolo*) has made some studies on flood forecasting system for some river basins. INADE has implemented some river protection works in the following basins: Tumbes, Chira-Piura, Olmos-Tinajones, Jequetepeque-Zana, Chavimochic, Chinecas, Majes-Siguas, Pasto Grande and Tacna. Such INADE projects are called "special projects".

#### (7) Watershed Management

National Program for River Basin Management and Soil Conservation (PRONAMACHS: *Proyecto Nacional de Manejo de Cuencas Hidrograficas y Conservacion de Suelos*) of Ministry of Agriculture has been active in provision of support for farmers in upstream area of the Cañete River Basin. PRONAMACHS assists farmers in forestry business and soil conservation. PRONAMACHS is given higher priority within the programs of the Ministry of Agriculture because it follows the strategy of poverty alleviation.

Severe soil erosion (*huayco*) is observed in the upstream area of the Cañete River Basin. However these areas are not densely inhabited, a little attention has been paid.

National Fund for Compensation and Social Development (FONCODES:*Fondo Nacional de Compensacion y Desarrollo Social*) which is the organization under the Ministry of Presidency provides the poor communities with grants to allow them to carry out small-scale infrastructure construction. FONCODES is active both in Cañete and in Yayuyos Provinces. There are many projects implemented in the poor communities on domestic water and drainage, and canal construction.

#### (8) Water Quality

General Directorate of environmental and health (DIGESA: *Directon General de Salud Ambiental*) of Ministry of Health has supervisory function for drinking water quality and sanitation service.

#### (9) Tourism

Ministry of Industry, Tourism, Integration, and International Trade (MITINCI) is the ministry responsible for tourism sector. The Ministry issued a Ministerial Resolution to designate the upstream area of the Cañete River Basin as the Tourist Reserve Area. Ecotourism is promoted in the reserved area. Any activity that may pollute the ecosystem is prohibited.

In addition to the upstream tourism area, river rafting is popular in rainy season in the lower stream of the Cañete River. For those who wish to use river water for tourism business, have to obtain water right from the Ministry of Agriculture.

#### (10) River Environment

There are several units concerned for environment issues in the line ministries. These environmental units include: General Directorate for Environmental Affairs (*Dirreccion General de Asuntos Ambientales* : DGAA) in the Ministry of Energy and Mining mainly for mining discharge, Sub-Directorate for Supervision and Evaluation of Environmental Affairs (*Sub Direccion de Fiscalizacion y Evaluacion Ambiental*) in the Ministry of Industry, Tourism, Integration and International Trade (MITINCI) for industrial sector, and General Directorate for Environmental Health (*Direcion General de Salud Ambiental* : DGSA) in Ministry for Health for domestic water and sanitation. National Institute of Natural Resources (INRENA) of the Ministry of Agriculture must be the principle agency responsible for river environment conservation.

#### **1.2** Institutional Improvement Plan for Cañete River Basin

The following three issues are identified as the areas for institutional strengthening for Cañate River Basin.

#### 1.2.1 Water Use Management

In view of the expected intensive water use in the Cañete River Basin, the following three options are considered as institutional strengthening measures.

#### (1) Establishment of AACH

The 1993 Constitution states that all natural resources belong to the State (Nation). Water sector has been managed by the various organizations under the leadership of Ministry of Agriculture. As development of water resources has become intensive and water uses have become complex, coordination among the related government organizations and water users are required. Thus Agricultural Investment and Promotion Law of 1991 stipulated the establishment of regional inter-sectoral water management entities: Autonomous Hydrological Basin Authorities -AACH-.

However AACH has yet to be established in the Cañete River Basin in spite of the fact that water usage has come to intense - agricultural, drinking water, industrial, hydropower generation and tourism -. Currently Technical Administrator in the Cañete Basin (Mala-Omas - Cañete district) operates with limited resources.

Hence, water resources seem to be poorly managed, for example, out-of-date water users registers do not correspond to the actual use of water. New licenses and permits are issued without due regard for the available water resources, possibly resulting in severe shortage during period of drought.

In addition, water users other than agricultural water users have little participation in Water Users Organizations. It may lead to a situation of water resources management decisions with little coordination. Though Water User Association is supposed be responsible for development and O&M of the facilities, their activities are limited now.

(2) Institutional arrangement included in the draft water resources law

The draft Law envisions the establishment of three mechanisms: Public Registry of Water Rights, National Water Council, Watershed Bureaus and Tradable Water Rights as described above (1.1 (5) Draft Water Resources Law and Figure 1.1 River Administration envisaged in the draft Water Resources Law).

(3) Water Resources Development Public Corporation – Japan's case

Rivers considered particularly important for national safety and economy are classified as Grade A river. The Minister of Construction acts as a river administrator for Grade A rivers. Grade B rivers, which are considered important to the public interest, are managed by the prefecture governor. River administrators have responsibility and the power for installation of facilities required for river management.

Seven river systems have been designated as important river systems for water resources development in Japan. The Basic Plan for Water Resources Development is established for each river system. It presents water demand forecast, sets targets of water supply and construction of necessary facilities.

The seven river systems cover areas of major economic and social activities. While it accounts for only 15% of the national land, it covers approximately 50% of the total population and 48% of industrial shipments.

1) Water Resources Development Public Corporation (WARDEC)

Water resources development projects require a long period for their completion. The projects must be based on long-term planning and implementation. This called for an organization which implement water resources development projects comprehensively and raising and distributing large funds, and for providing experts and engineers.

The government established Water Resources Development Public Corporation (WARDEC)<sup>2</sup>, a non profit, public corporation with the

<sup>&</sup>lt;sup>2</sup> "Outline of the Corporation" Japan, Water Resources Development Public Corporation

objectives of improving water utilization and flood control in 1962. WARDEC implements projects on the river systems for the development and utilization of water resources that are urgently needed for industrial development and increasing urban population.

It constructs large-scale dams, estuary barrages, water level controlling facilities for lakes and marshes, and water channels for various purposes.

- 2) Activities of WARDEC
  - Construction and reconstruction of facilities under the Basic plans;
  - Maintenance of facilities after completion;
  - Study, research and design related to the development of utilization of water resources as well construction and maintenance of power generation commissioned to the Corporation;
  - Water utilization projects: projects to supply raw water for domestic, industrial and agricultural purposes;
  - Flood control projects: projects for flood control and maintenance of normal river functions.
- 3) Financial Resources

Projects of Water Resources Development Public Corporation are financed by the following sources:

- Government grants (Ko-fu kin): flood control and storm surge protection works, and maintenance and improvement of river ways;
- Subsidies (Hojokin): subsidy for agricultural, industrial and domestic water supply works
- Beneficiary contribution: costs received from beneficiaries during construction and installment expenses for industrial and agricultural water works
- Loan capital (including issue of Water Resources Development Bonds):
- Other revenue: Income from study and research, on construction of related facilities including hydropower facilities and roads.
- (4) Summary of the options

Options	Descriptions (strengths & weaknesses)						
ААСН	There are already 5 examples. Easy to implement with some improvements in finance through improvement of water right registry and water tariff collection						
New Water Resources Law	Effective for efficient allocation of water, but strong opposition for the draft.						
Water Resources Development Corporation	Effective for applying beneficiary to pay principle and management of multi-purpose facilities						

As seen above, the three options are all supposed to contribute to water use management. In terms of short-term implementation, establishment of AACH is recommended. The establishment of AACH does not contradict with the provisions of new Water Resources Law. The establishment of new entity like WARDEC may require further discussion among related government agencies. Water use management strengthening through AACH is therefore explained at this stage. The detailed examination of AACH operation in Cañete River Basin will be made in the next phase of the Study.

Establishment of AACH with various water users' participation in the Cañete River Basin would contribute to water resource management. The AACH shall be financed with the water tariff. Therefore, it has to improve its ability to set and collect adequate water tariff. Thus viscous cycle of "perception of the government as water provider - low water tariff collection - poor O&M uncertainty over the availability of water - low water tariff collection" will be cut.

Figure 1.3 shows the present and proposed organizational setting for river administration in the Cañete River Basin. However, the composition of AACH needs further study and discussion.

#### **1.2.2** Environment and Development

High fluxes of pollution from mining industry are observed in the Cañete River Basin. Severe erosion (*Huayco*) phenomenon occurred in the upstream area of the Cañete River. These are two observations from the Study Team's environmental study.

National Environmental Council (Consejo Nacional del Ambiente - CONAM) has functions of policy formulation and coordination. There are several units concerned for environment issues in the line ministries. In spite of the fact that there are many environmental units in the various Ministries, the objective of achieving sustainable development and environmental conservation does not seem to be achieved. The environmental units in the line ministries alone can not integrate environmental conservation with development activities. It is because the line ministries act as the promoter of the respective industries including mining, and industry. It would be more appropriate if CONAM had active linkage with Vice ministers (both for Infrastructure and for Regional Development) of the Ministry of Presidency. In addition to CONAM, National Institute for Natural Resources (INRENA) shall assume important roles in view of the right use of the Capacity building of CONAM and INRENA will be natural resources. recommended, as shown on Figure 1.4.

In addition to CONAM institutional strengthening, there are other areas of improvement. Some of the issues to be considered urgently may include the following:

- (1) Strict enforcement of prohibiting waster water discharge together with establishment of monitoring system; and
- (2) Provision of technical and financial support for industrial enterprises for conversion to cleaner technology.

#### **1.2.3 Hydrology Data Collection**

National Service for Meteorology and Hydrology (SENAMHI: *Servicio Nacional de Meterologia e Hidrologia*) is the agency responsible for rainfall gauging. There are approximately 1,700 gauging stations in Peru however only 700 of them are now in operation. There is only one runoff gauging station (Socsi) operated by SENAMHI at present within the Cañete River. In addition to SENAMHI's gauging station, there are other gauging station established and operated by Electroperu. The policy for hydrological data collection should be defined. There are two options: 1) strengthening organizational capacity of SENAMHI by allocating more budget and human resources, or 2) transfer the data collection duty to other organization.

# TABLES

#### Table 1.1 Summary of Tasks of Organizations related to Water Resources Development and Management

Dc : Data Collection Pl : Planning OM : Operation/Maintenance Mo: Monitoring

Re : Regulatory Coo : Coordination I: Implementation

N.B. 1. Contractors are not counted. 2. "Planning" role is to be assumed by the Government.

3. Though AACH does not exist in the Canete River Basin, included in the Table for reference.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	N	AIPRI	E	CON D MINIS	SEJO E STROS	JO MAG ROS			MEM MITINCI		INCI	MEF MS M		MD	LOCAL GOVERN- MENT		PRIVATE SECTOR						
Organizations	SEDAPAL	INADE	FONCODES	CONAM	INDECI	ATDR	INRENA	PRONAMACHS	PSI	ААСН	DGE	DGAA	MITINCI	SDFEA	SUNASS	DIGESA	SENAHMI	LOCAL GOVERNMENT	EMAPA CANETE S.A.	OUA	ELECTROPERU	INDUSTRIAL ENTERPRISES	CEMENTOS LIMA
TASKS	rasks																						
I. Water Resources Development																							
1. Surface Water	Ι	DC,I				Pl, Re	Pl, Re	Pl, Re	Ι	Pl, Re	Coo	Coo	Coo	Coo			Dc				Dc		
2. Groundwater	Ι					Pl, Re	Pl, Re	Pl, Re		Pl, Re												Ι	
<ol><li>Forest management</li></ol>							Pl, Re	Pl, Re															
4. Sediment Control					Pl, I	Ι	Ι			Ι										Ι	Mo, I		Mo, I
5. Debris control				Coo	Pl, I											Mo		Ι					
. Water Resources Management																							
1. Water balance	Mo					Dc, Pl	Pl			Pl, Re							Mo			Dc, Pl			
2. Water allocation	Mo					Re	Pl, Re	Pl, Re		Pl, Re													
3. Water supply								,													•••••		
3.1 Agricultural water		Pl, I	Ι			Pl,Re	Re	Ι	Ι	Pl, Pe										ОМ	OM	Ι	
3.2 Domestic water	Ι		Ι			Re	Re			Pl, Pe					Mo, Re	Re			Ι				
3.3 Industrial water	Ι					Re	Re			Pl, Pe		†							Ι			Ι	[
3.4 River maintenance flow						Coo	Coo			Coo		†											
3.5 Hydro power generation						Re	Re			Re	Pl, Re	Coo									Ι		Ι
4. Flood control			•	L	•	4		•	•	·		÷	· · · · · · · · · · · · · · · · · · ·	•	L		L			L	•		
4.1 Flood and disaster control		Pl			Pl, I		Coo,I			Coo			[ 					Dc, OM					
4.2 Flood forecasting		Pl			Pl, I					†								Dc, OM					
5. Water quality				Pl			Re		Ι			İ											
5.1 River water	Mo			Co				Re	Ι	Re						Mo	Mo						1
5.2 Waste water discharge	Mo			Co								Ī		Re				Mo					
River environment and Tourism																							
6.1 River and surrounding areas		[		Co	[			Re		Re			Pl										
6.2 Recreation around river areas				Co				Re		Re		1	Pl			[							
6.3 Biota in the river area				Co				Re		Re		İ				[							

#### Abbreviations :

AACH : Autoridad Autonoma de la Cuenca Hidrografica ATDR : Administracion Tecnica de District de Riego CONAM : Consejo Nacional del Ambiente DGAA : Direccion General Asuntos Ambientales DIGESA : Direccion General de Salud Ambiental DGE : Direccion General de Electricidad DGM : Direccion General de Minas ELECTROPERU : Empresa de Electricidad del Peru FONCODES : Fondo Nacional de Compensacion y Desarrollo INADE : Instituto Nacional de Desarrolo INDECI : Instituto Nacional de Defensa Civil INRENA : Instituto Nacional de Recursos Naturales MAG : Ministerio de Agricultura MD : Ministerio de Defensa MEM : Ministerio de Energia y Minas MIPRE : Ministerio de la Presidencia MITINCI : Ministerio de Industria, Turismo, Integracion y Negociaciones Comerciales Internacionales MS : Ministerio de Salud OUA : Organizaciones de Usuarios de Aguas PRONAMACHS : Proyecto Nacional de Manejo de Cuencas Hidrograficas y Conservacion de Suelos PSI : Provecto Subsectoral de Irrigación SDFEA : Sub Dirección de Fiscalización y Evaluación Ambiental

SEDAPAL : Servicio de Agua Potable y Alcantarillado de Lima

SUNASS : Superintendecia Nacional deServicios de Saneamiento

SENAMHI : Servicio Nacional de Meteorogia e Hidrologia

Autonomous Hydrographic Basin Authority Technical Administration for Irrigation District National Environment Council Directorate General for Environmental Affairs Directorate General for Environmental Health Directorate General for Electricity Directorate General for Mining Peru Electricity Enterprise National Fund for Compensation and Social Development National Institute of Development National Institute of Civil Defense National Institute of Natural Resources Ministry of Agriculture Ministry of Defense Ministry of Energy and Mining Ministry of Presidency Ministry of Industry, Tourism, Integration and International Trade Ministry of Health Water Users' Association National Program for River Basin Management and Soil Conservation Irrigation Subsector Project

Sub-Directorate for Supervision and Evaluation of Environmental Affairs Potable Water and Sewage Service of Lima National Service for Meteorology and Hydrology National Superintendence of Sanitary Service

## FIGURES





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(Proposed)



STUDY ON INTEGRATED WATER RESOURCES DEVELOPMENT		
IN	Figure 1.4	Proposed CONAM Institutional
THE CAÑETE RIVER BASIN IN THE REPUBLIC OF PERU		Strengthening
JAPAN INTERNATIONAL COOPERATION AGENCY		