

SECTOR J

***STRENGTHENING OF INSTITUTIONAL SETUP
AND CAPACITY BUILDING FOR FLOOD MITIGATION
AND RIVER MANAGEMENT***

VOLUME 3: SUPPORTING REPORT

SECTOR J: STRENGTHENING OF INSTITUTIONAL SETUP AND CAPACITY BUILDING FOR FLOOD MITIGATION AND RIVER MANAGEMENT

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SECTOR J. STRENGTHENING OF INSTITUTIONAL SETUP AND CAPACITY BUILDING FOR FLOOD MITIGATION AND RIVER MANAGEMENT

1. PRESENT INSTITUTIONAL SETUP

1.1 Outline

In general, the following agencies are concerned in the flood mitigation for so-called major rivers such as Indus, Jhelum, Chenab, Ravi and Sutlej: PIDAs/PIDs, WAPDA, Provincial relief Organization, Pakistan Army, PCIW, Emergency Relief Cell, FFC and NFFD (National Flood Forecasting Division).

In the case of Lai Nullah, the organizations directly responsible for the flood mitigation from its catchment areas to its end point are, CDA, RDA, TMA, RCB and Small Dam Organization. As the coordination agency for the flood issues, FFC plays an important role under the umbrella of Ministry of Water and Power. These agencies are involved in the different activities like implementation, management, operation and maintenance and so on. Brief description of present institutional setup of these organizations is as follows:

1.2 Organizations related to Management of Lai Nullah

The organizations currently related to the management of Lai Nullah are as enumerated hereinafter:

1.2.1 Ministry Water And Power (MWP)

Present Institutional setup of the Ministry of Water and Power (MWP) is summarized below:

1) General Functions

Besides all Policy matters related to the subjects of Water and Power, MWP has the following main functions (refer to Fig. J.1).

- (a) Preparation of the Five-Year Master plan, the Annual Development Plan, and the Five-Year Financial plan for various projects.
- (b) General Monitoring activities in the fields of irrigation, drainage, water logging, reservoirs, floods, Power generations, transmission and distribution.
- (c) Coordination among various Federal Agencies such as WAPDA, KESC, and Provincial Irrigation Departments (PID) for the development and operation of all projects in both the water and the power sectors.
- (d) Coordination in matters relating to import/export of electricity between WAPDA and KESC during critical periods.

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- (e) Overall supervision of performance of WAPDA, KESC, NPCC, NTCC and NESPAK etc.
- (f) Monitoring of operation of the “Indus Water Treaty of 1960” between Pakistan and India.
- (g) Policy matters pertaining to national engineering bodies including Pakistan Engineering Council, Institute of Engineers, and Chamber of Engineers.
- (h) Liaison with international engineering bodies in water and power sectors. These bodies include, but are not limited to, International Commission on Irrigation and Drainage (ICID), the International Commission on Large Dams (ICOLD) and the International Commission on Large Power System (CIGRE).

2) Role of MW P in Lai Nullah Management,

With regard to Lai Nullah development projects, MWP always plays a very important and key role. All mega projects related to Lai Nullah are cleared under MWP. On 30th day of May, 1984 ECNEC in its meeting decided to setup a Technical Committee under the Chairmanship of Secretary MWP to discuss Lai Nullah related Issues and since then MPW has been involved fully in activities concerning Lai Nullah.

1.2.2 Federal Flood Commission (FFC)

The present institutional setup of FFC is as briefed hereinafter:

1) General Function

Up to the end of 1976, Provincial Irrigation and Power Departments were responsible for the planning and execution of flood protection works. In view of the disastrous flood faced by the country in the year 1973 and 1976, which caused heavy loss of life and infrastructure, indicate that flood protection facilities have been inadequate. This prompted the creation of the Federal Flood Commission (FFC) in January 1977. The major responsibilities and duties assigned to FFC are:

- (a) Preparation of National Flood Protection Plan (NFPP);
- (b) Approval of provincial flood control schemes;
- (c) Reviews of plans for restoration and reconstruction works;
- (d) Review of measures for improvements in the flood forecasting and warning system;
- (e) Evaluation and monitoring of the progress of implementation of National Flood Protection Plan, and;

- (f) Preparation of research program for flood mitigation and other flood management measures.

Since its creation, FFC has coordinated the implementation of flood works amounting to over Rs. 10 billion under a number of programs (i.e. Normal ADP, FPSP-I, 1988 FDRP, FPSP-II, etc.) financed by Government of Pakistan and various donor agencies.

The organization chart of FFC is shown in Fig. J.2.

2) Role of FFC in Lai Nullah Management

With regard to Lai Nullah development projects, ECNEC in its meeting held on 30th day of May, 1984 decided to set up a Technical Committee under the Chairmanship of the Secretary of MWP and additionally consisting of the Chairman of WAPDA, the Chairman of CDA, the representative of Punjab Irrigation and Power Department and the Chief Water, Planning Commission to go into the technical issues raised and come up with an agreed plan on flood control measures for Lain Nullah.

Later on, the Technical Committee held several meetings regarding the issues. In the Technical Committee meeting held on the 20th day of August 1985, a sub committee chaired by CEA/CFFC was designated to supervise the feasibility study for the Pacca Canalization of Lai Nullah. Furthermore, it was decided that Federal Flood Commission may act as lead agency for the project by National Economic Council.

In view of the above recommendations and the flood passed in July 2001, FFC felt very seriously necessity of strengthening coordination between the responsible agencies like CDA, RDA, and RCB regarding Lai Nullah management. As a part of institutional strengthening, the Chairman of FFC has decided to constitute a steering committee to supervise the future development and management works of Lai Nullah. After getting the approval from Ministry of Water and Power, the Steering Committee has been constituted for the stakeholders of Lai Nullah vide office No. FC-I(5)34-2001-XIX dated October 10, 2001 with the following setup.

<u>Agencies Concerned/Person in Charge</u>	<u>Role of Steering Committee</u>
CEA/CFFC	Chairman
Chief Engineer (DSC) / Floods	Member / Secretary
Member of Eng. Directorate, GHQ, Rawalpindi	Member
Representative of 10 Corps	Member
Representative from CDA, RDA, TMA & PID	Member

1.2.3 Capital Development Authority (CDA)

The present institutional setup of CDA is summarized below::

1) General Function

The Capital Development Authority (CDA) was constituted on the 14th of June 1960 under a CDA act, as a corporate body for the purpose of planning development and constructing the Federal Capital of Pakistan. The Authority shall prepare a master plan and the phased master program for the development of the Capital sites and may prepare a similar plan and program for the rest of the specified areas. All such plans and programs shall be submitted to the Central Government for approval.

The authority may, pursuant to the master plan and master program, call upon any local body or agency operating in the specified areas to prepare, in consultation with the Authority a scheme or schemes in respect of matters ordinarily dealt with by such local body or agency and there upon the local body or agency shall be responsible for the preparation of the scheme or schemes with a reasonable time.

Such Schemes may relate to, land use, zoning and land reservation, public buildings, industry, transportation, communications, highways, roads, streets, railways, aerodromes and Tele-communications. The organization chart showing the major staffing setup is shown in Fig. J.3.

2) Role of CDA in Lai Nullah Management

It has been pointed out by CDA officials that until 2001 the CDA has never had any flood fighting plan for Lai Nullah tributaries and never allocated any budget for this purpose. This is because, according to the CDA staff, rainwater coming from upper catchment areas of Lai Nullah at Margalla hills, always passes through CDA territory safely and outfall into the main Lai Nullah channel near Kattarian Bridge.

Unfortunately, in July 2001, an exceptionally intense rainfall took place and due to the very heavy storm the Lai Nullah channel overflowed and inundated in the I – 9 Sector of Islamabad along the I.J principle road. After the severe damages in July 2001, CDA was forced to realize the importance of an operational plan to fight against the expected rainwater storm in the future. For this purpose, a meeting was held on July 1st, 2002 by the chairman of CDA and the operational plan was discussed in detail that how to face the expected flood in future. After the meeting a notification to others concerned was issued for this purpose, vide No. CDA/DS-2(2)/2002/38 dated July 9, 2002. The Chairman informed in the meeting that the un-precedent rain in last year and the above average rain predicted

for the coming monsoon in 2002 necessitates preemptive measures to assure protection against damage to life and infrastructures. The meeting also discussed the last year's experience and the actions that could be taken to avoid repetition of the situation. The Chairman also designated the Director for Sanitation as the key person/co-coordinator on behalf of CDA for the arrangements to pass the storm water safely from the capital city.

It was informed that CDA has realized the importance of countermeasures for storm water. However, according to the office of the Director for Sanitation, no additional budget was allocated for this purpose. The Director for Sanitation had made all the arrangements utilizing his existing staff and his normal budget.

1.2.4 Punjab Irrigation and Power Development (PID)/Small Dam Organization (SDO)

The present institutional setup of PID and SDO is as briefed hereinafter:

1) General Function

The Small Dam Organization (SDO) is the office under the Punjab Irrigation and Power Department in Lahore, which is presently responsible for the operation and maintenance of Rawal Dam. After the dissolution of West Pakistan Agricultural Development Corporation in January 1972, SDO was established by the Central Government but finally it was decided to entrust its functions to the respective provinces from February 1, 1973. This office has a vast experience on flood mitigation projects for rivers and hill torrents and construction of small dams throughout the Punjab Province and especially in Potohar Plateau around Islamabad. About 31 small dams have already been constructed by the organization in the Pothohar area during the last thirty years and operation and maintenance of all those dams is also being done by SDO office very successfully. The organization chart showing the existing organizational setup is at Fig. J.4.

2) Role of SDO for the Management of Lai Nullah

After the exceptionally high flood that occurred in Lai Nullah in July 2001, the Secretary of the Government of Punjab, Irrigation and Power Department in Lahore (PID) was asked by the Army Head Quarter in Rawalpindi to give the technical opinion on the management of Lai Nullah to avoid future damages. The secretary has given a briefing at the Corp Commander's office at Rawalpindi on the 2nd of August 2001. The secretary explained that PID through its subordinate office located at Islamabad (SDO), had conducted so many studies regarding the flood management of Lai since 1973. He also added the following recommendations based on the previous studies on behalf of the Punjab Irrigation and Power Department.

- (a) Diversion of Saidpur, Kanitawali and Tenawali Kas to reduce the flood peak

discharge through the main Lai Nullah channel.

- (b) Construction of check / detention dams in the upper catchment areas of Lai Nullah.
- (c) Knocking down the natural fall near the Fauji Foundation to a desired level.
- (d) Removal of encroachments along Lai Nullah to provide a clear waterway.
- (e) Notification of the flood plain to curb the tendency of future encroachments.
- (f) Pacca Canalization of Lai Nullah.

1.2.5 Rawalpindi Development Authority (RDA)

The present institutional setup of RDA is as briefed hereinafter:

1) General Function

The Rawalpindi Development Authority (RDA) was established in 1989 (total area of jurisdiction is 311 sq. km), under the Punjab Development of Cities ACT-1976. Its existing organizational setup is shown in Fig. J.5. The major responsibilities of RDA are to plan, guide, control and implement major and long term development works, as follows:

- (a) Building control in its controlled areas.
- (b) To launch housing schemes and other similar projects and to control private housing schemes.
- (c) Land development and estate management.
- (d) Preservation of environment.
- (e) To evolve policies and plans including their implementation.
- (f) Provision and maintenance of water supply and sewerage services in the city.
- (g) Improvement, beautification, operation and maintenance of parks.
- (h) Construction of major roads and advertisement boards etc.

As a part of institutional strengthening, the Water and Sanitation Agency (WASA) was established in 1992 as an agency of RDA to deal with the water supply and sewerage services for the areas under the control of RDA. It became partially operational after taking over the Rawal Lake Filtration Plant from the Public Health Engineering Department in 1996 and further became fully operational in 1998 after taking over the responsibility for water supply and sewerage services from Rawalpindi Municipal Corporation (RMC).

2) Role of RDA in Lai Nullah Management

According to the responsibilities mentioned above, it seems that RDA plays a role to deal with surface drainage or flood mitigation projects relating to Lai Nullah in the context of

water supply, sewerage, land development and management within the city. A network of sewers covers the central city area bounded by Lai Nullah, Kassi Nullah and Asghar Mall Road. Most of the system discharges untreated sewage to Kassi Nullah, which ultimately flows into Lai Nullah. In addition to the above, Lai Nullah is prone to occasional short periods of flooding during the summer / rainy season every year and due to the tight sections, the channel overflowed and caused severe inundation during these flood events and damages to people living close to the banks of Lai Nullah, particularly those in Kachi Abadies.

In view of the foregoing, RDA started implementing the sub-project named “Lai Nullah Improvement works” under ADB finance. The project is still in progress but expected to be completed in July 2003. It is expected that after the completion of this project, the channel section will be improved and the possibility of overflow and inundation of the areas around the Lai Nullah will also be reduced up to some extent. The Project Management Unit (PMU) established in 1994 under the Rawalpindi Development Authority (RDA) is responsible for execution of the Project.

1.2.6 TEHSIL Municipal Administration (TMA) in Rawalpindi

The present institutional setup of TMA is as briefed hereinafter:

1) General Function

In line with the present institutional strengthening, the Punjab Government issued an act in 2001 to devolve the political power and decentralize administrative and financial authority by setting up the Tehsil District and Union Administration (refer to Fig. J.6).

As a result of the above Gazette Notification issued by the Government of Punjab, Rawalpindi Tehsil Municipal Administration (TMA) was also established. According to the notification, TMA is a corporate body and consist of a Tehsil Nazim, Tehsil Municipal Officer, Tehsil Officer, Chief Officer and other officials of the local council services, as shown in Fig. J.7. The major duties assigned to TMA Rawalpindi under the new act are,

- (a) To prepare spatial plans for the Tehsil in collaboration with the union councils, including plans for land use and zoning.
- (b) To seek approval of the Tehsil Council on the spatial plans prepared by it after due process of dissemination and public enquiry, incorporating modifications on the basis of such enquiry.
- (c) To execute and manage development plans.
- (d) To exercise control over land-use, land-subdivision, land development and zoning by public and private sectors for any purpose including agriculture, industry,

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commerce, market, shopping and other employment centers, residential, recreation, park entertainment, passenger and other transport freight and transit stations.

- (e) To enforce all municipal laws, rules and by-laws governing its functioning.
- (f) To prevent encroachment.
- (g) To regulate affixing of signboards and advertisements.
- (h) To provide, manage, operate, maintain and improve the municipal infrastructure and services,
- (i) To compile information provided by the union and village councils of prioritized projects in the Tehsils.
- (j) To prepare budget, long term and annual municipal development programs in collaboration with the union councils under the direction of Tehsil Nazim.
- (k) To maintain with the assistance of District Governments, Union and village Councils, a comprehensive data base and information system for Tehsil Municipal Administration and provide public access to it on nominal charges.
- (l) To propose and notify taxes, user fee, rates, rents, tolls, charges, levies, fines, and penalties after approval of Tehsil Council.
- (m) Collect approved taxes, user fee, rental rates, tolls, charges, fines and penalties.
- (n) To organize sports cultural and recreational events, fair and shows.
- (o) To coordinate and support municipal functions among unions and villages.

2) Role of TMA in Lai Nullah Management

As mentioned earlier, TMA is fully responsible for the sewage and sewage treatment as well as disposal, and storm water drainage. TMA needs arrangements for the safe passage of storm water from the upper catchments and outfall safely to the Sawan River without causing any damage to the infrastructures.

After the severe damage during the flood 2001 monsoon, TMA has formulated a comprehensive flood fighting plan to protect valuable lives and the infrastructure of Rawalpindi City. Based on the plan, TMA has made the following emergency arrangements.

- (a) Establishment of flood control rooms.
- (b) Water drainage arrangements, machinery/equipment movement facility with in the city during flood days.
- (c) Set-up of flood relief camps.
- (d) Establishment of flood warning system.

- (e) Arrangement of sanitary personnel and Lai Nullah special gangs.
- (f) Spray of germicide, vaccination and first aid.
- (g) Establishment of the Public Relations Department to appraise/inform the general public about emergency situations in the area through telephone line services and the media like radio, TV and the newspapers.

1.2.7 Rawalpindi Cantonment Board (RCB)

The present institutional setup of RCB is as briefed hereinafter:

1) General Function

Rawalpindi City had the population of about 1,234,880 in 1992, of which approximately 45% reside in cantonment areas under the jurisdiction of the Military Engineering Services (MES) and the Rawalpindi Cantonment Board (RCB), while the remaining 55% lived in the jurisdiction of RDA. The organizational set up is shown in Fig. J.8 and the major responsibilities of the Cantonment Board are as follows:

- (a) Municipal Administration
- (b) Provision of Civic Amenities i.e., water supply, sanitation, roads/streets/lanes, street lights and surface drainage
- (c) Fire Fighting
- (d) Taxation
- (e) Building Control
- (f) Land Management
- (g) Horticulture
- (h) Primary Education
- (i) Acquisition and maintenance of Cantonment Property
- (j) Registration of Births and Deaths
- (k) Maintenance of Public Markets/Slaughter houses/Public toilets
- (l) Regulation of trade and professions
- (m) Enforcement of pure foods act
- (n) Enforcement of Muslim Family Laws

2) Role of Cantonment Board in Lai Nullah Management

Through a discussion and interview with a staff of the cantonment board, it was gathered that the cantonment board does not have any kind of precautionary measure against the

floodwaters flowing through Lai Nullah in the jurisdiction of the Rawalpindi Cantonment Board. In addition, it was also pointed out that there is no project proposed at the present and there has never been any kind of funds allocated and spent for flood mitigation measures in Lai Nullah, because the Lai Nullah channel passing within the jurisdiction of the cantonment board is almost safe and there were very few complaints about the inundation of an area. Besides, no serious damage has ever been recorded during the flood season. After the exceptionally high flood in 2001, the Board was forced to think about flood mitigation measures for the future.

1.3 Legal Framework on Water Issues

This section presents the legal framework on water issues in the field of water resources development, flood mitigation, water quality control as well as watershed management.

1.3.1 Water Resource Management

Water resources management in Pakistan may fall under any of the following legislations:

- (1) Indus Water Treaty in 1960
- (2) Indus River Water Apportionment Accord in 1991
- (3) Canal and Drainage Act in 1873
- (4) Provincial Irrigation and Drainage Authority Act in 1997
- (5) Punjab Minor Canals Act, 1905
- (6) Soil Reclamation Act in 1952 and Land and Water Development (Control over Underground Waters) Rules, 1965

1) Indus Water Treaty in 1960

The major rivers in the Indus River System lie across the border in India-held Kashmir. In the Indus Water Treaty in 1960, basic agreements on water issues such as exchange of flood information and water allocation between both countries are stipulated.

2) Indus River Water Apportionment Accord in 1991

The water flowing in the Indus River System is allocated in principle among provinces. The Indus River Water Apportionment Accord in 1991 stipulates the basic rule for the water allocation among provinces.

3) Canal and Drainage Act in 1873

Water allocated for each province under the Indus River Water Apportionment Accord will be managed by the Provincial Irrigation and Drainage Authority under the Canal and Drainage Act.

It is stipulated in the preamble of the Canal and Drainage Act, that “throughout the territories to which this Act extends, the Provincial Government is entitled to use and control for public purpose the water of all rivers and streams flowing in natural channels, and of all lakes, sub-soil water and other natural collection of still water.”

Then, in the preamble of Punjab Irrigation and Drainage Authority Act in 1997, the following statements are made for establishment of the Authority:

- (a) To implement the strategy of the Government of Punjab for streamlining the Irrigation and Drainage System;
- (b) To replace the existing administrative set-up and procedures with more responsive, efficient and transparent arrangements;
- (c) To achieve economical and effective operation and maintenance of the irrigation, drainage and flood control system in the Province;
- (d) To make the irrigation and drainage network sustainable on a long-term basis and introduce participation of beneficiaries in the operation and management.

Further, water users will utilize the water under the guideline and management of On-Farm Water Management and Water Users Associations Act in 1981.

4) Punjab Minor Canals Act, 1905

The Punjab Minor Canals Act was provided to make better provision for the control and management of minor canals in certain areas of West Pakistan. It extends to the Divisions of Rawalpindi, Sargodah, Lahore, Multan, Quetta and Kalat except the Tibal areas. In the Act, the following statement can be found regarding the prohibition of construction of canals without permission: “ When the Provincial Government has notified in this behalf any natural canal, lake or other collection of water, no person shall without permission previously obtained construct a canal intended to be fed from any such channel, lake or other collection of water.”

5) Soil Reclamation Act, 1952 and Land and Water Development Board Rules, 1965

As for the control over ground water, the following statements are provided in the Act:

- (a) The use of underground waters in that area except the water used for domestic purposes or for watering livestock shall come under the control of the Board (West

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Pakistan Land and Water Development Board).

- (b) Any owner or occupier of land in the area, who desires to put up a new tube-well, or other appliance, worked by electricity, steam, oil or wind-power for using underground waters for purposes other than domestic or for watering livestock shall apply to the Project Director for a license. (Project Director means an officer appointed by the West Pakistan Land and Water Development Board who is overall in charge of operation under the scheme.)

1.3.2 Flood Mitigation

As mentioned above, the responsibility for river management on flood mitigation, in principle, is on the Provincial Irrigation and Drainage Development Authority in the territory as stipulated in Punjab Irrigation and Drainage Authority Act in 1997. To further strengthen the function for flood mitigation basin-widely, the Federal Flood Commission (FFC) was established by Cabinet Resolution “No. W-II-3(23)/76-FFC” in January 1977.

FFC has provided the National Flood Protection Plan (NFFP-I; 1977-‘87, and NFFP-II; 1988-‘98) to show the policy for flood management covering the whole country. (NFFP-III is under progress.)

To streamline the flood preparedness and review the flood fighting arrangements, a high level meeting chaired by the Secretary, Ministry of Water and Power, was held with the participation of PIDAs, PMD/NFFD, WAPDA, and PCIW, as well as FFC. In the meeting the following items were discussed:

- (1) Status of strengthening of Flood Protection Network by the Provinces and Identification of areas of weaknesses
- (2) Flood fighting plan for the Year 2001-flood season and preparedness of Provincial Irrigation Departments
- (3) Progress of on-going improvements in flood forecasting and warning system including performance of the System during the monsoon season of 2000
- (4) Arrangements made by PCIW for procurement of river flow data from India
- (5) Any other items

1.3.3 Water Quality

According to the Report “Environmental Legislation in Pakistan (Islamabad, 1993)”, the following legislations are provided for water quality management:

- (1) The Pakistan Penal Code, 1860;
- (2) The Canal and Drainage Act, 1983;

- (3) On-farm Water Management & Water Users' Associations Act, 1981;
- (4) The Punjab Local Government Act, 1979; and,
- (5) The Pakistan Environmental Protection Act, 1983

The major points prescribed in these laws are as follows:

1) The Pakistan Penal Code, 1860

In the Code, the following statement is provided as punishment for the action of fouling water of public spring or reservoir; "Whoever voluntarily corrupts or fouls the water of any public spring or reservoir, so as to render it less fit for the purpose for which it is ordinarily used, shall be punished with imprisonment of either description for a term which may extend to three months, or with fine which may extend to five hundred rupees, or with both."

2) The Canal and Drainage Act, 1983

In the Act, the following statements are mainly specified:

- (a) Definition of terms such as canal and water course;
- (b) Liability when water taking from canal or watercourse is unauthorized;
- (c) Power to prohibit obstructions or order their removal;
- (d) Offences under act; and
- (e) Others.

Among these, as the offenses under the Act the following statement is specified relating to the water quality: "Whoever, without proper authority does any of the following acts, that is to say; corrupts or fouls the water of any canal so as to render it less fit for the purpose for which it is ordinarily used,----- shall be liable on conviction before a Magistrate of such class as the Provincial Government directs in this behalf, to a fine not exceeding two hundred rupees or to imprisonment not exceeding three months or both."

3) On-Farm Water Management & Water Users' Associations Act, 1981

In the act, the following statements are found for water management including water quality management on farm land: " Where the irrigators of a watercourse are jointly responsible with others for the construction, maintenance or improvement of a watercourse or jointly making use of a watercourse with others, have formed themselves into an Association and the same is registered with the Field Officer under the provisions of the Act, he shall, before undertaking the reconstruction, maintenance of improvement of the watercourse, provide an opportunity to the Association to carry out the job of

reconstruction, maintenance or improvement of the watercourse.” (Herein, the meaning of improvement includes that of water quality.)

4) Punjab Local Government Act, 1979

In this act, the following statements are provided for water quality management:

- (a) An urban local council may, by notice, require the owner or any person having control of any private source of water supply used for drinking purposes: to keep the same in flood order and to clean it from time to time of silt, refuse and decaying matter and to protect the same from contamination in such manner as the urban local council directs.
- (b) An urban local council may through a notice require the owners, tenants and occupiers of commercial and industrial concerns in any area or areas within its local area to have at their own cost prepared a scheme for the adequate and safe drainage and disposal of their wastes and effluent of the quality permitted under the rules or the bye-council within the time specified in the notice.
- (c) The drainage, sewerage and disposal scheme as approved by an urban local council with modification, if any, shall be executed and implemented by the owners, tenants or occupiers of the commercial or industrial units at their expense in such manner and within such time as may be specified by an urban local council.

5) The Pakistan Environmental Act, 1983

In the Act, the following statements are observed:

- (a) The Federal Government shall, by notification in the official Gazette, establish a Council to be known as the Pakistan Environmental Protection Council, which holds the functions such as establishment of comprehensive national environmental policy and enforcement of the National Environment Quality Standards.
- (b) The Federal Government shall, by notification in the official Gazette, establish an Agency to be called the Pakistan Environmental Protection Agency, which has the functions such as preparation of national environmental policy for approval of the Council and establishment of National Quality Standards with the approval of the Council.

In accordance with the functions stipulated in the act, the Pakistan Environmental Protection Agency established the National Environmental Quality Standards including water quality relating to municipal and liquid industrial effluents in “the Gazette of Pakistan on August 29, 1993”.

1.3.4 Watershed Management

It may be difficult to identify the legal framework in connection with watershed management. Herein, this issue is examined from two legal aspects; forest conservation and land use.

1) Forest Conservation

The following acts are concerned in forest conservation;

- (a) The Forest Act, 1927
- (b) The West Pakistan Firewood and Charcoal (Restriction) Act
- (c) The Cutting of Trees (Prohibition) Act, 1975
- (d) The Punjab Local Government Act, 1979

The major points prescribed in these laws are as follows:

a) The Forest Act, 1927

As the power to reserve the forest, the following statements are made in the act: “The Provincial Government may constitute any forest-land or waste-land which is the property of Government, or over which the Government has proprietary rights, or to the whole or any part of the forest-produce of which the Government is entitled, a reserved forest in the manner hereinafter provided.”

Further, the Act prohibits the following activities; “Any person who makes any fresh clearing prohibited by Section 5, or sets fire to a reserved forest, or, in contravention of any rules made by the Provincial Government in this behalf, kindles any fire, or leaves any fire burning, in such ----- shall be punishable with imprisonment for a term which may extend to -----.

Besides, it stipulates power to make rules for protected forests as follows: “The Provincial Government may make rules to regulate the following matters, namely, the cutting, sawing, conversion and removal of trees and timber, and the collection and removal of forest-produce, from protected forests, the granting of licenses, the examination of forest-produce passing out of such forests, and so on.”

b) Pakistan Firewood and Charcoal Restriction Act

In the Act, the following statements are made: “It shall be unlawful to burn firewood of charcoal in any factory, brick-kiln, lime-kiln or such other fire places or class of fire places as may be specified by Government by notification. Any person who contravenes the provisions or such of the rules made under this Act, as may be

specified, shall be liable to simple imprisonment for a term which may extend to thirty days or with fine up to five hundred rupees or with both.”

c) The Punjab Plantation and Maintenance of Trees Act, 1974

In the Act, the following statements are made: “ There shall be planted and maintained three trees per acre by the occupier thereof in such manner as may be prescribed. In case the occupier fails to comply with the requirements, the required number of trees shall be caused to be planted in his land by the Department without any let or hindrance by him. The occupier shall be responsible for the maintenance of the trees so planted. Any person who contravenes the provision shall be liable to pay the penalty----“

d) The Cutting of Trees (Prohibition) Act, 1975

In the Act, the following statements are made; “Notwithstanding anything contained in any other law for the time being in force, no person shall, without the prior written approval of the local formation commander or an officer authorized by him in this behalf, cut, fell or damage or cause to be cut, felled or damaged any tree growing within the five miles belt along the external frontiers of Pakistan. Whoever contravenes the provisions of this Act or the rules made there-under shall be punishable with imprisonment for a term which may extend to three years, or with fine, or both.”

2) Land Use

The following acts are concerned with land use in terms of environment preservation;

- (a) The Punjab Development of Damaged Areas Act, 1952
- (b) The Punjab Soil Reclamation Act, 1952
- (c) The Islamabad (Preservation of Landscape) Act, 1966

The major points prescribed in these laws are as follows:

a) The Punjab Development of Damaged Areas Act, 1952

The following statements are made in the Act: “The Government may, by notification, declare any local area or any part of any local area to be a damaged area. An improvement trust may frame a scheme or schemes for the development of a damaged area, -----.”

b) The Punjab Soil Reclamation Act, 1952

The following statements are made in the Act: “The Board (set up by the Provincial Government) may on its own motion or on the application of any owner or any person interested in land within a local area frame or require a department to frame, a scheme for reclamation of the local area or part thereof or for prevention of the spread of thur or sem likely in the opinion of the Board to threaten the local area in the near future providing for all or any of the following matters---. The breaking up, cultivation, afforestation or plantation of lands and the raising, lowering or reclamation of any land for the production of food grains, fruit,-----.“

c) The Islamabad (Preservation of Landscape) Act, 1966

The following statements are made in the Act; “ No person shall remove, destroy, damage or alter anything, or commit any other act if such removal, destruction, damage, alteration or act affects or likely to affect a landscape injuriously. Whoever contravenes any provision of this act or any rules made there-under, or abets such contravention, shall be punishable with imprisonment for a term which may extend to six months, or with fine which may extend to five thousand rupees, or with both.

2. ISSUES OF PRESENT INSTITUTIONAL SETUP FOR FLOOD MITIGATION AND RIVER MANAGEMENT

2.1 Organization

As discussed in the previous chapter, there are several agencies concerned in flood mitigation and river management. The major functions of these agencies are summarized in Table J.1. As identified in the table, there is no agency designated to exclusively manage the whole Lai Nullah basin for flood mitigation. Most of these agencies are concerned in the works related to the flood management in their own territories or control areas, except FFC. From the situation, the following issues are presumed:

- (1) Flood mitigation plans may be formulated independently in each territory or control area by each agency with different scale and measures.
- (2) In such plans, there may be some discrepancy or gap in the strategy of river management among territories or control areas, especially between upstream and down stream.
- (3) As a result, flood mitigation plans can be hardly promoted, especially in case the coordination among agencies concerned is required.

The above situation can be presumed from the fact that flood mitigation projects could not be implemented for a long time in Lai Nullah basin, even though many projects had been proposed since the 1960's by several agencies concerned.

2.2 Legal Arrangement

As for the flood mitigation and river management including water resources development, water quality and watershed management, there are several laws, acts and acts provided as discussed in Section 1.3. The list of legal arrangements relating to flood mitigation and river management is shown in Table J.2. As noticed from the legal arrangements, most of the issues relating to flood mitigation and river management are in principle settled. However, the following issues are pointed out concerning the legal arrangement at present:

- (1) Several agencies are involved in their jurisdiction areas, and management is undertaken with their own interest or benefits in mind. As a result, it may be difficult to have a consistent basin-wide river management from upstream to down stream.
- (2) There are many laws, acts and acts related to flood mitigation and river management, and this causes difficulty in fully understanding the whole of the relevant legal arrangement.
- (3) The statements in the above laws, acts and acts are relatively brief, and it may be difficult to cope with detailed issues on river management based on such statements.

For the consistency of basin-wide river management and to facilitate understanding of the necessary statements, it is preferable to integrate the relevant laws, acts and acts into an exclusive "River Management Law or Water Law" and make the stipulations more elaborate.

2.2.1 Major Issues after Formulation of Comprehensive Flood Mitigation and Environmental Improvement Plan

So far several issues on institutional arrangement have been pointed out relating to the river management of Lai Nullah. With regard to these issues, after the formulation of a comprehensive flood mitigation and environmental improvement plan, the following consequence can be expected:

- (1) The plan holding the basin-wide consistency of flood mitigation from upstream to downstream is to be formulated with the mutual understanding and agreement among the agencies concerned under the strict coordination of FFC, although it may require further modification in accordance with the promotion of the project.
- (2) In this connection, most of the issues in the planning stage will, in principle, be settled, although some minor issues may remain unsolved.

Eventually, the major issues after formulation of the master plan will evolve during the implementation stage, and the following are presumed:

- (1) Strengthening of existing organization or establishment of new organization as well as securing of budget for implementation.
- (2) Provision of all legal support for the smooth implementation and for better river management.

3. BASIC STRATEGY FOR STRENGTHENING OF INSTITUTIONAL SETUP FOR FLOOD MITIGATION

As discussed in the previous sections, there are several issues to be solved for better flood mitigation and river management. The strengthening of institutional setup would be undertaken in the strategy discussed in the following sections:

3.1 Strengthening of Organization

As for the strengthening of organization for implementation of the master plan, the following two cases are examined; (1) Strengthening of existing organization, especially FFC; and, (2) Establishment of new organization. Besides, to support activities of such organizations, the arrangement of a new committee in the Ministry of Water and Power is considered.

3.2 Legal Arrangement

In case of legal arrangement to support the implementation of the master plan, it seems to be necessary to enact the “River Management Law” or the “Waters Law” which shall cover mainly the following items:

- (1) Clarification of purpose and principles of river administration
- (2) Definition of river administrator
- (3) Designation of river conservation zone and projected river zone
- (4) Regulation and restriction for river and river use
- (5) Financial responsibility for river administration
- (6) Penalty against the rule
- (7) Others

However, it will take a long time to provide such “River Management Law” or “water law.” In this study, only an outline of the River Law in Japan is introduced (refer to Annex).

4. STRENGTHENING OF ORGANIZATION

4.1 Conceivable Cases for Establishment of Organization for Project Implementation

As mentioned earlier, the following two cases are examined for the establishment of an organization for project implementation:

- (1) Establishment of new organization for project implementation
- (2) Strengthening of existing organization

For the former idea, the establishment of a new authority for the implementation and management of Lai Nullah is conceived as an example. However, the idea is not recommendable for the following reasons:

- (1) There are several existing agencies concerned in project implementation, such as CDA and RDA. The establishment of a new organization would result in the existence of three authorities in Lai Nullah basin, which may cause the conflict of functions and responsibilities among these organizations.
- (2) In principle, the function of the new authority will be limited to only the management of Lai Nullah basin. After implementation of the master plan, the work volume will be too minor to justify the maintenance of the new organization.

Judging from the above conditions, it is considered to strengthen the existing organization for implementation of the Master Plan. For the matter, the following considerations are made:

- (1) Although it is necessary to confirm the measures to be applied to the Master Plan as well as the responsible agencies, those mainly involved in the implementation will be CDA, RDA, TMA, RCB, FFC and the Ministry of Water and Power.
- (2) Among these agencies, the major functions for project implementation will be as follows, judging from the present practice:

Table R J. 1 Major Functions for Project Implementation

Agencies Concerned	Major Functions
FFC	Coordination for financing, planning, design, supervision, O&M and others (land acquisition, logistics, etc)
CDA, RDA, TMA, RCB	Implementation of planning, design, supervision, O&M and others in their territory or control area
Ministry of Water and Power	Financing of the project and support to pertinent organizations for implementation of the master plan.

- (3) Most of the agencies concerned already have the functions and experiences to implement such kind of projects, so that only minor changes will be necessary for strengthening the present organization; namely increase of staff in accordance with the

increase from the present work volume.

- (4) In case of FFC, however, it is expected that the work volume will increase so much as the coordination agency for project implementation, so that the scale of strengthening of present organization may be quite large.
- (5) As for the Ministry, there is no committee to exclusively support the implementation of the master plan.

Herein, the Study for strengthening of present organization will concentrate on that for FFC and the Ministry of Water and Power as discussed later.

4.2 Establishment of Task Force for Lai Nullah

4.2.1 Necessity of Task Force

As mentioned earlier, FFC will shoulder a heavy burden in the implementation of the Master Plan in Lai Nullah, while it has also a huge responsibility in the management and coordination of other major rivers in Pakistan as routine works. In this connection, to cope with the additional works for implementation of the master plan in Lai Nullah without disturbing the present routine works, it is necessary to set up a task force (or a project unit), which will exclusively handle the work of coordination for implementation of the master plan of Lai Nullah basin.

4.2.2 Outline of the Task Force

The outline of the Task Force will be as follows:

1) Basic Function

The basic functions of the Task Force will include the following works:

- (a) To review and modify the Master Plan of flood mitigation and environmental improvement of Lai Nullah including the implementation schedule.
- (b) To explain the Master Plan to the agencies concerned and the public.
- (c) To formulate the Financial arrangements for implementation of the Master Plan
- (d) To implement the Feasibility Study (F/S) on the project components included in the Master Plan if necessary.
- (e) To allocate and issue instructions regarding the project components to each responsible agency including land acquisition and house evacuation.
- (f) To supervise and coordinate the works.
- (g) To exercise overall management and issue instructions regarding operation and maintenance work to the agencies concerned

2) Necessary Personnel and Staff of the Task Force

To cover the above functions, it is considered that the personnel and staff shown in the table below are required for the effective operation of the Task Force (refer to Fig. J.9):

Table R J. 2 Necessary Personnel for Task Force

Personnel	Functions
Chief Engineer and Secretary	Responsible for all the works related to management of Lai Nullah
Financial and Legal Officer	Responsible for all financial and legal aspects.
Plan and Design Engineers with support staff	Responsible for all planning and design works and their coordination among agencies concerned
S/V and O&M Engineers with support staff	Responsible for all supervision and operation and maintenance works and their coordination among agencies concerned
Logistics personnel with support staff	Responsible for all logistical support including public relations and coordination

4.3 Formulation of Management Committee within the Ministry of Water and Power

4.3.1 Necessity of Formulation of Management Committee

As already discussed in Chapter 1, the ECNEC had constituted a technical committee in 1984, under the Chairmanship of the Secretary of MWP, for the smooth implementation of development projects in Lai Nullah. Based on the plan, the Chairman of WAPDA, the Chairman of CDA, the Representative of IPD Punjab and the Chief of Waters, Planning Commission have been asked to go into the technical issues raised and come up with an agreed plan on the flood mitigation measures for Lai Nullah. Later on, the technical committee held meetings from time to time for this purpose. Ultimately, during the meeting held on August 20, 1985 another sub-committee was constituted under the Chairmanship of CEA / CFFC and also decided that FFC may act as lead agency for the Lai Nullah Project.

4.3.2 Member of the Committee

In view of the above situation, there is dire need of reactivation of the Technical Committee in the Ministry with the setup shown in the Table R.J.3 below. The committee may have monthly meetings and may discuss the issues regarding Lai Nullah every month in the presence of representatives of all stakeholders; namely, FFC, CDA, RDA, TMA and the Rawalpindi Cantonment Board.

Table R J. 3 Organizational Setup of Management Committee

Name of Organization	Role
Ministry Water And Power (MWP)	Chairman
Federal Flood Commission (FFC)	Member
Capital Development Authority (CDA)	Member
Rawalpindi Development Authority (RDA)	Member
Tehsil Municipal Administration (TMA)	Member
Rawalpindi Cantonment Board (RCB)	Member
Small Dam Organization of IPD (SDO)	Member

4.3.3 Basic Functions of the Management Committee

In principle, the basic functions of the Management Committee will be as follows:

- (1) Support to financial arrangement of implementation of the master plan.
- (2) General monitoring of progress of the master plan.
- (3) Coordination on issues beyond control of FFC's Task Force between Federal and Provincial agencies, i.e., FFC, CDA, RDA, TMA, RCB and SDO.

5. CAPACITY BUILDING

The measures applied in this Study are, in principle, conventional ones; therefore, it may not be necessary to prepare a special program to introduce new technology and thus, the project implementation will be promoted based on the knowledge previously obtained through experience. However, it is considered that FFC will need to recruit and educate new personnel to successfully perform the additional works for project implementation.

In this connection, it is recommended that a capacity building assistance program shall be prepared with the following components:

- (1) Development of key management capability
- (2) Financial and legal management capability
- (3) Planning and design management capability including environmental knowledge
- (4) S/V, O&M and contract management capability
- (5) Logistical support including public relations and coordination capability

In principle, it is believed that the capability of personnel for the above components could be enhanced through the following opportunities:

- (1) On-the-job-training through participation in a similar project under the implementation stage;
- (2) Participation in training programs consisting of seminars and workshops and/or lectures

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from experts; and,

- (3) Others.

These opportunities will be found or arranged as follows:

- (1) The first opportunity for on-the-job-training could be found in the course of activities of related agencies inside of Ministry of Water and Power.
- (2) The second and third opportunities could be arranged by foreign experts or consultants specializing in institutional matters.

The period for on-the-job-training will be, in principle, one (1) year before the start of implementation of the Master Plan and then, the other capacity building programs will be continued in parallel with the progress of project implementation.

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TABLES

Table J.1 Role of Agencies concerned in Flood Mitigation and River Management

Agencies Concerned	Role for Flood Mitigation and River Management in Lai Nullah Basin				Covering Area
	Planning	Implementation	Operation & Maintenance	Coordination	
Federal Flood Commission(FFC)	△	-	-	○	Whole Lai Nullah Basin
Capital Development Authority (CDA)	○	○	○	-	Islamabad Capital Territory
Small Dam Organization (SDO)	○	○	-	-	Upstream of Lai Nullah Basin
Rawalpindi Development Authority (RDA)	○	○	-	△*	RDA Control Area (Part of Rawalpindi Tehsil)
Tehsil Municipal Administration (TMA) in Rawalpindi	-	-	○	△*	Rawalpindi Tehsil
Rawalpindi Cantonment Board (RCB)	○	○	○	△*	Rawalpindi Cantonment

*: Coordination among RDA, TMA and RCB each other

Table J.2 Legal Arrangement

Category	Name of Law, Act and Ordinance	Key Stipulation related to Category
Water Resources Development	Indus Water Treaty in 1960	Basic agreements on water issues between both countries of Indus Water
	Indus River Water Apportionment Accord in 1991	Rule of allocation of Indus water among provinces
	Canal and Drainage Act in 1873	Entitle of Provincial Gov. to use and control water of all rivers and streams in the territory
	Provincial Irrigation and Drainage Authority Act in 1997	Establishment of Authority and the role of authority
	Punjab Minor Canals Act, 1905	Control and management of minor canals in certain areas of West Pakistan
	Soil Reclamation Act in 1952 and Land and Water Development (Control over Underground Waters) Rules, 1965	Use of underground waters
Flood Mitigation	Punjab Irrigation and Drainage Authority Act in 1997	Responsibility of Provincial Irrigation and Drainage Development Authority for river management on flood mitigation
	Cabinet Resolution “No. W-II-3(23)/76-FFC” in January 1977	Establishment of Federal Flood Commission (FFC)
Water Quality	The Pakistan Penal Code, 1860	Punishment for the action of fouling water of public spring or reservoir
	The Canal and Drainage Act, 1983	Liability for corrupts or fouls of the water of any canal
	On-farm Water Management & Water Users’ Associations Ordinance, 1981	Water management including water quality management on farm land
	The Punjab Local Government Ordinance, 1979	Requirement for the owner having control of any private souce of water supply used for drinking purpose
	The Pakistan Environmental Protection Ordinance,1983	Establishment of Pakistan Environmental Protection Council and establishment of National Environmental Quality Standard including Water Quality
Forest Reservation	The Forest Act, 1927	Responsibility of Provincial Government to reserve the forest
	The West Pakistan Firewood and Charcoal (Restriction) Act	Restriction for burning of firewood or charcoal in any factory, brick-kilm and so on
	The Cutting of Trees (Prohibition) Act, 1975	Restriction of cutting trees growing within the five miles belt along the external frontiers
Land Use	The Punjab Development of Damaged Areas Act, 1952	Declaration and development of damaged area
	The Punjab Soil Reclamation Act, 1952	The role of Bord for breaking up, cultivation, afforestation and so on of any land for the production of food grains, fruite, etc.
	The Islamabad (Preservation of Landscape) Ordinance, 1966	Restriction of activities to likely affect a landscape injuriously

SECTOR J

FIGURES

ORGANIZATION CHART of MINISTRY of WATER & POWER

Current



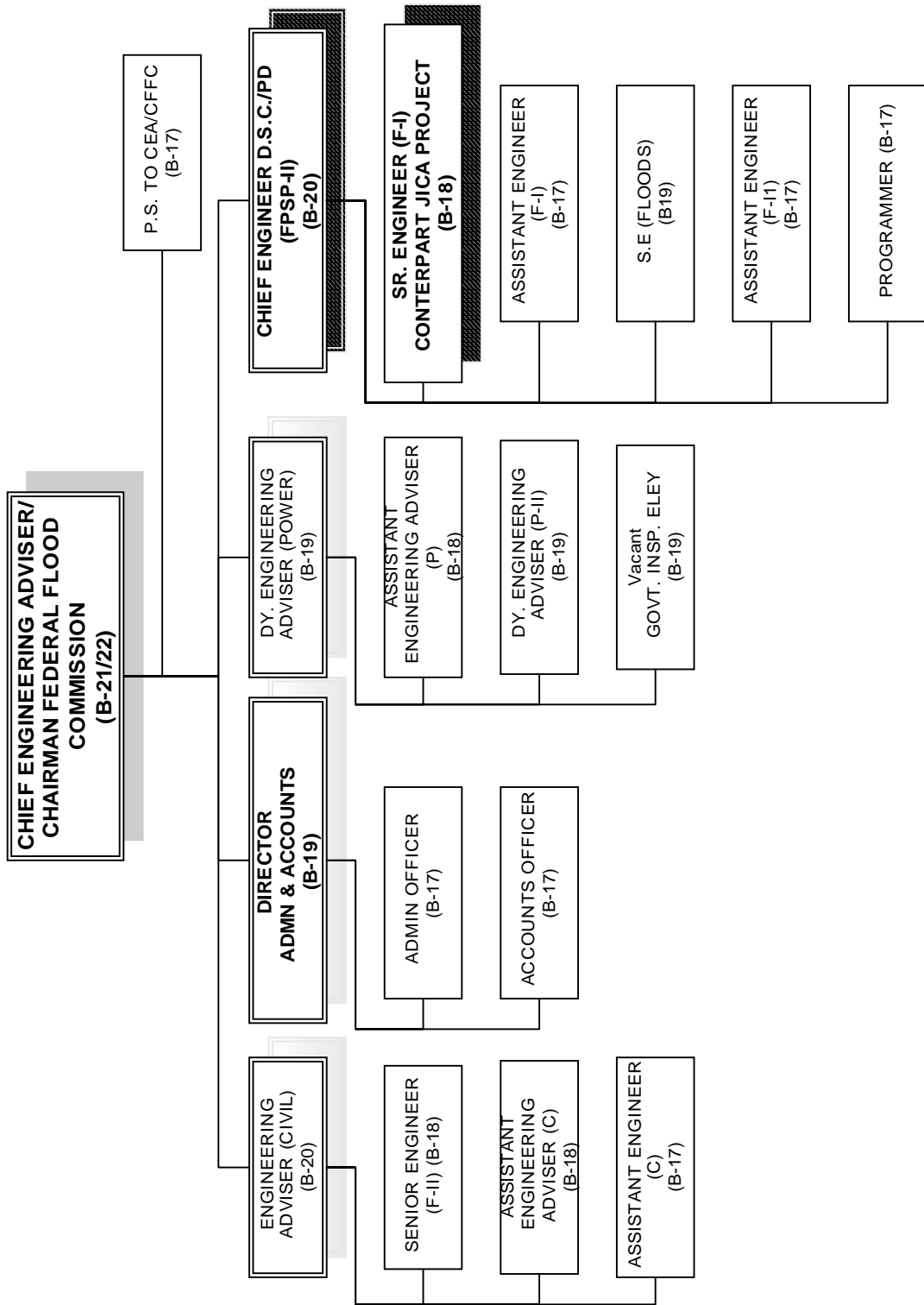
THE STUDY ON COMPREHENSIVE FLOOD MITIGATION
AND ENVIRONMENTAL IMPROVEMENT PLAN
OF LAI NULLAH BASIN
IN THE ISLAMIC REPUBLIC OF PAKISTAN

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig.J.1

Organization Chart of Ministry of Water and Power

Organization Chart of Office of the CEA / CFFC Ministry of Water and Power



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Fig. J.2

Organization Chart of Office of the Chief
Engineering Adviser/Chairman Federal Flood
Commission Ministry of Water and Power

Organization Chart of Capital Development Authority(CDA)

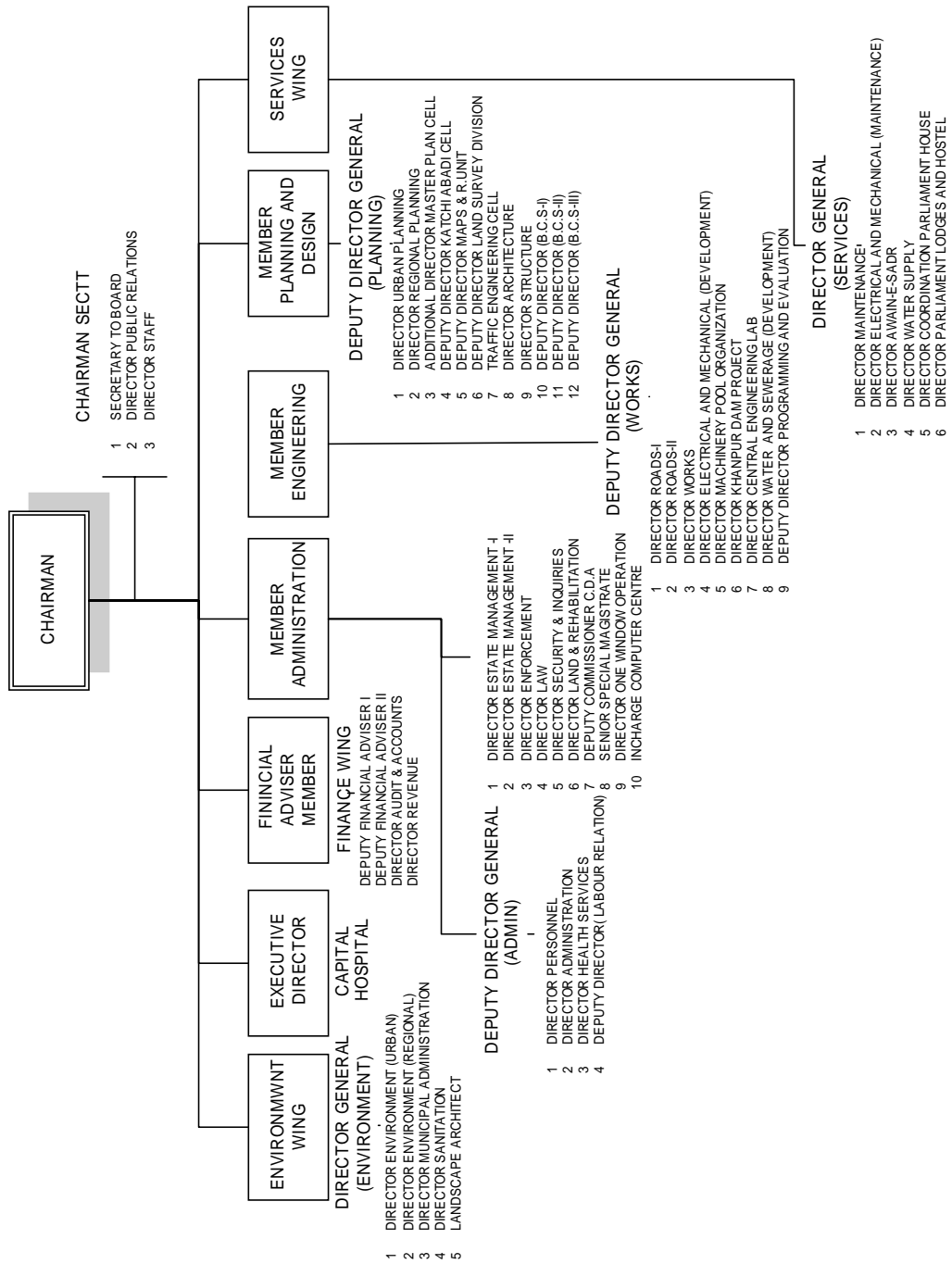
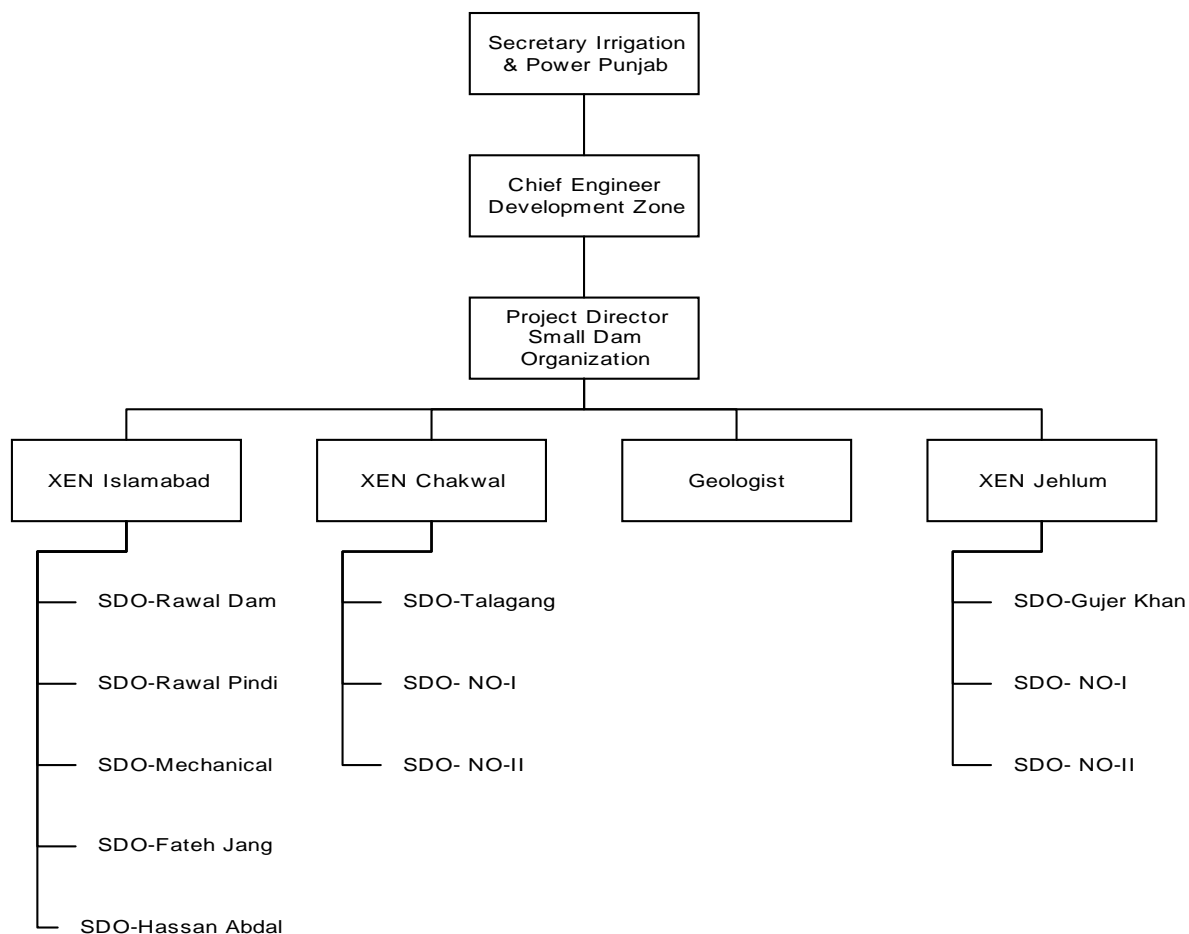


Fig. J.3
 Organization Chart of Capital Development Authority (CDA)

Organization Chart of Small Dams Organization (SDO)



Organization Chart of Rawalpindi Development Authority (RDA) Urban Development Wing

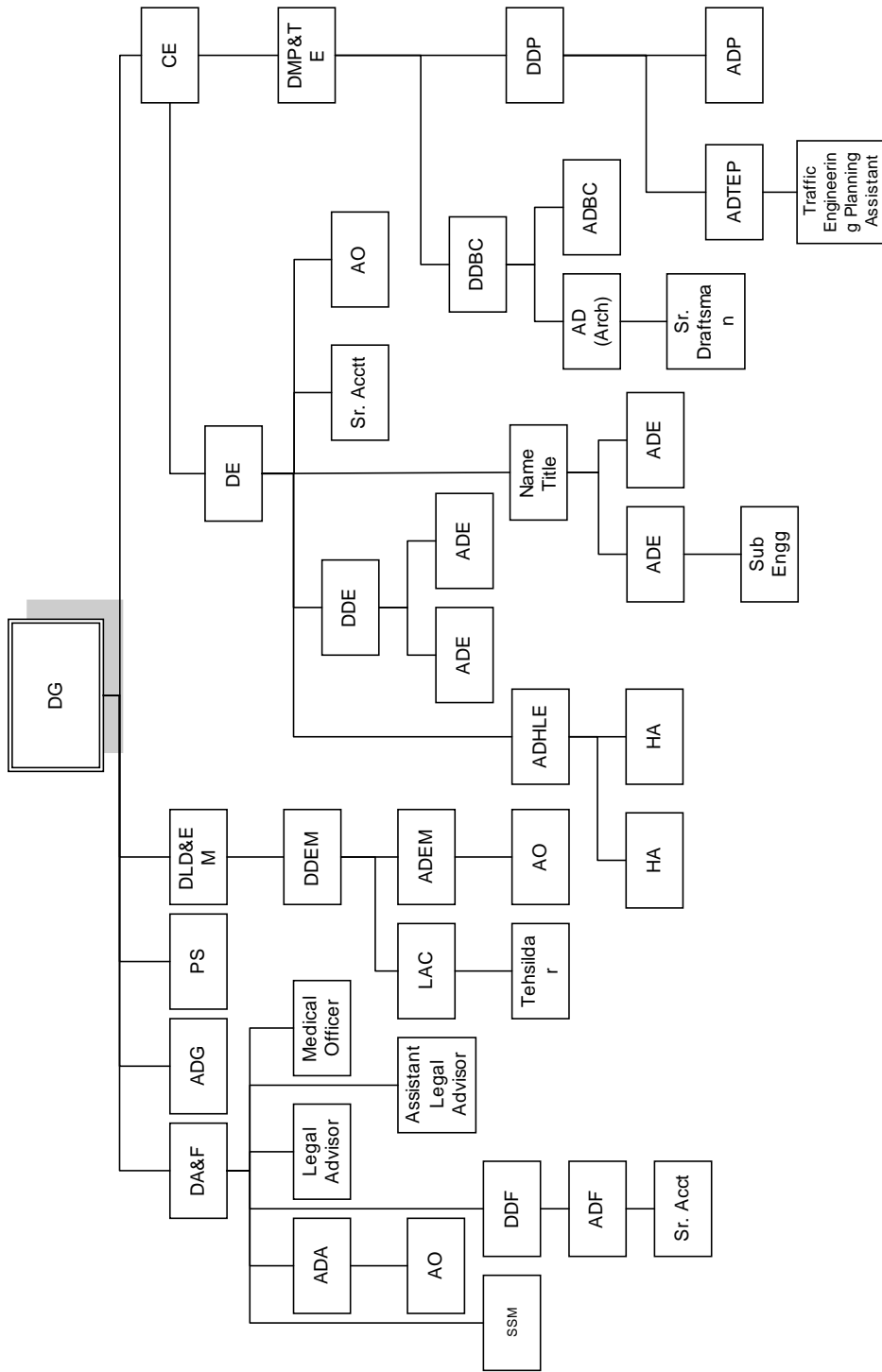
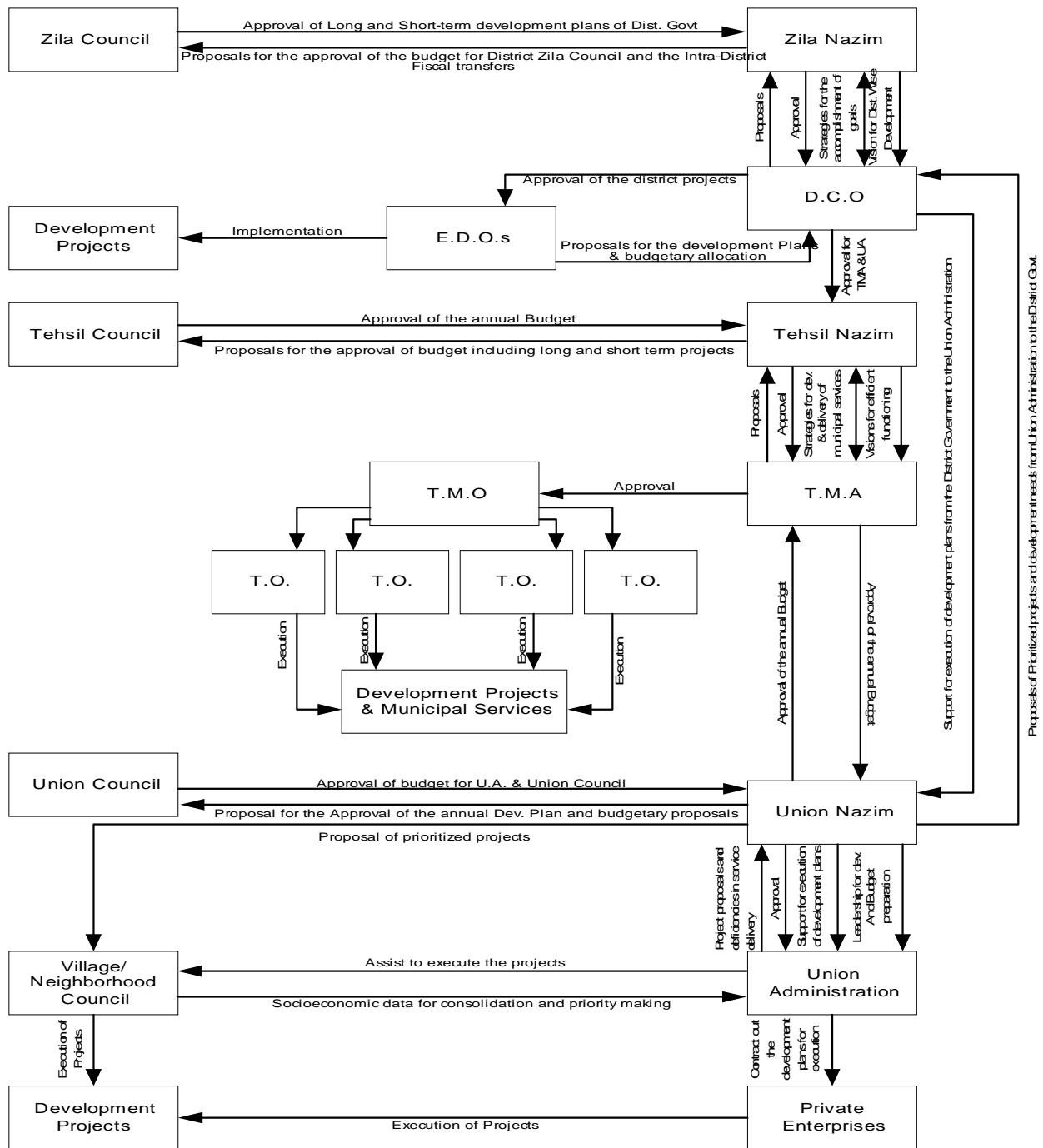


Fig. J.5
Organization Chart of Rawalpindi Development Authority (RDA) Urban Development Wing

Organization Chart of District Tehsil and Union Administration

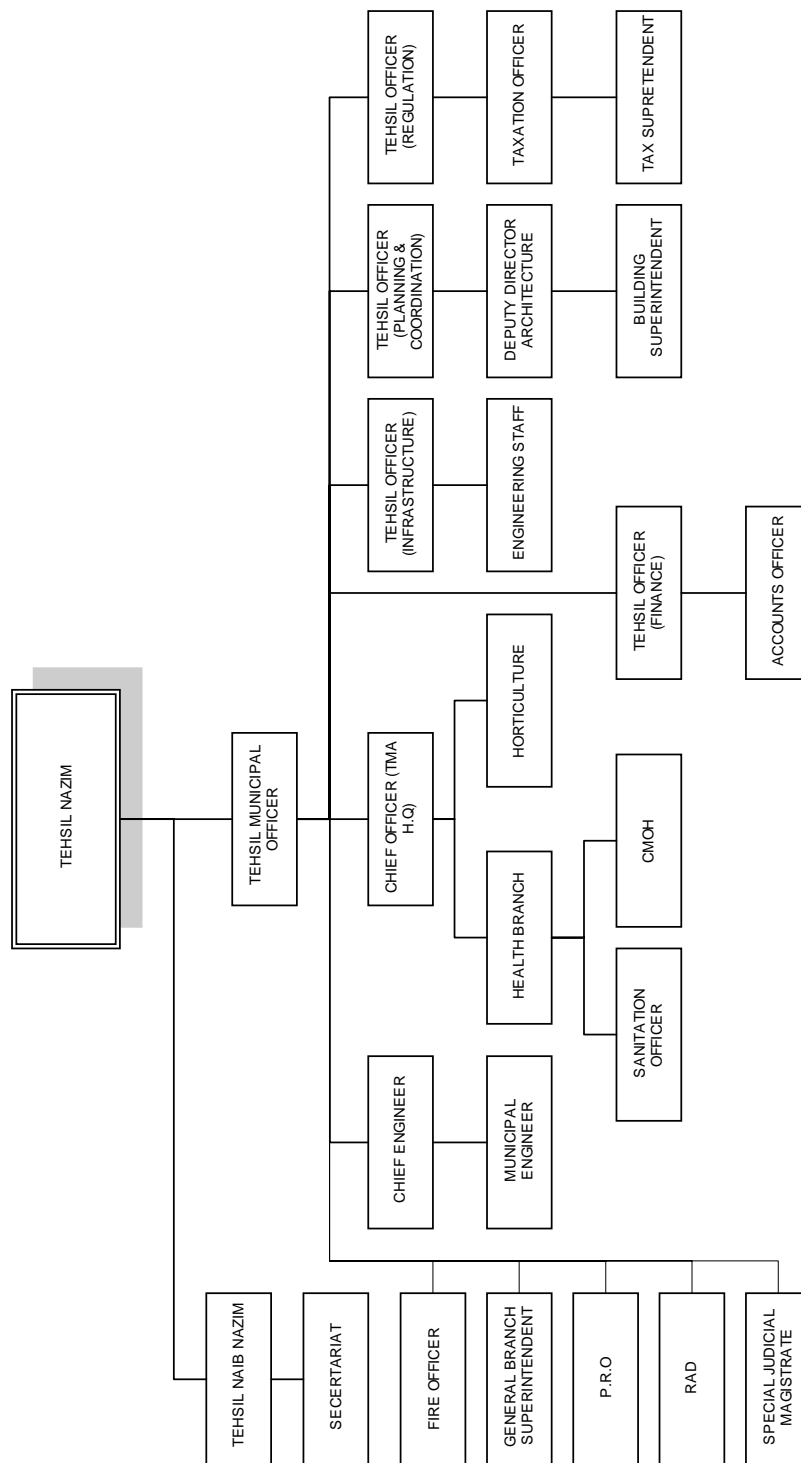


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Fig.J.6

Organization Chart of District Tehsil and Union Administration

Organization Chart of Tehsil Municipal Administration Rawalpindi



Organization Chart of Rawalpindi Cantonment Board

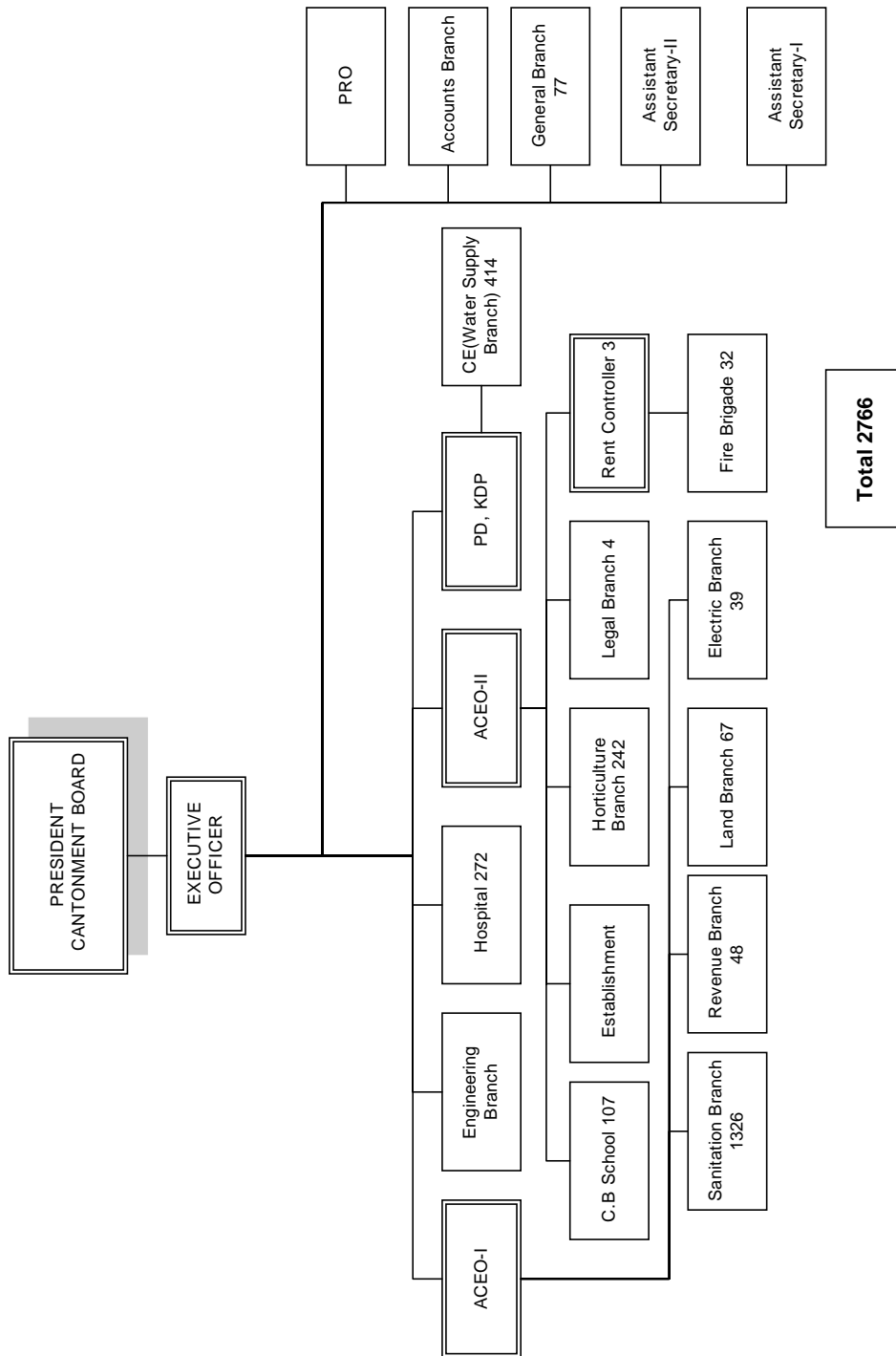


Fig. J.8
 Organization Chart of Rawalpindi Cantonment Board

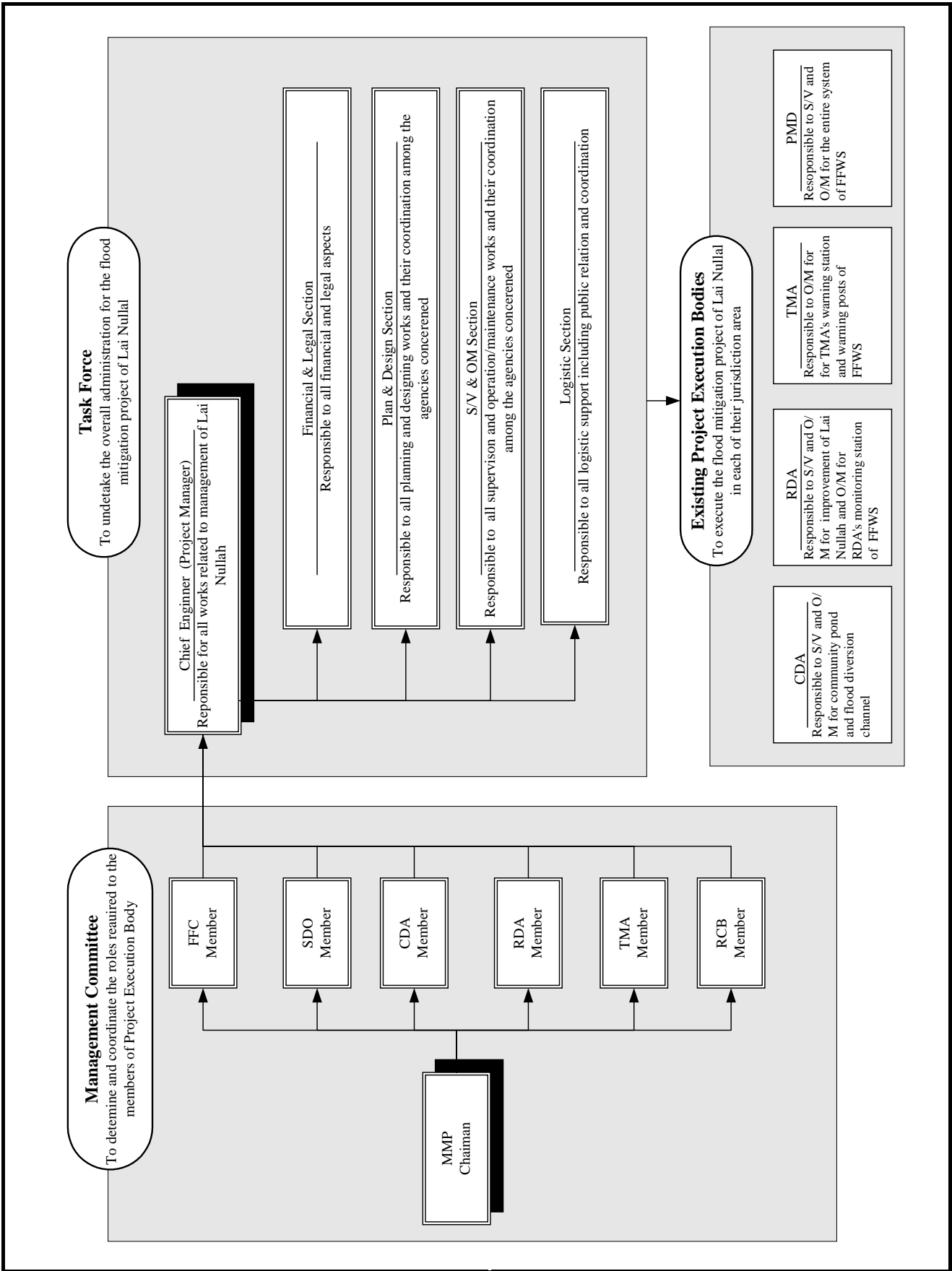


Fig. J.9
Flow Diagram of Duties of Task Force and other Relevant Organizations for Implementation of Flood Mitigation Project of Lai Nullah