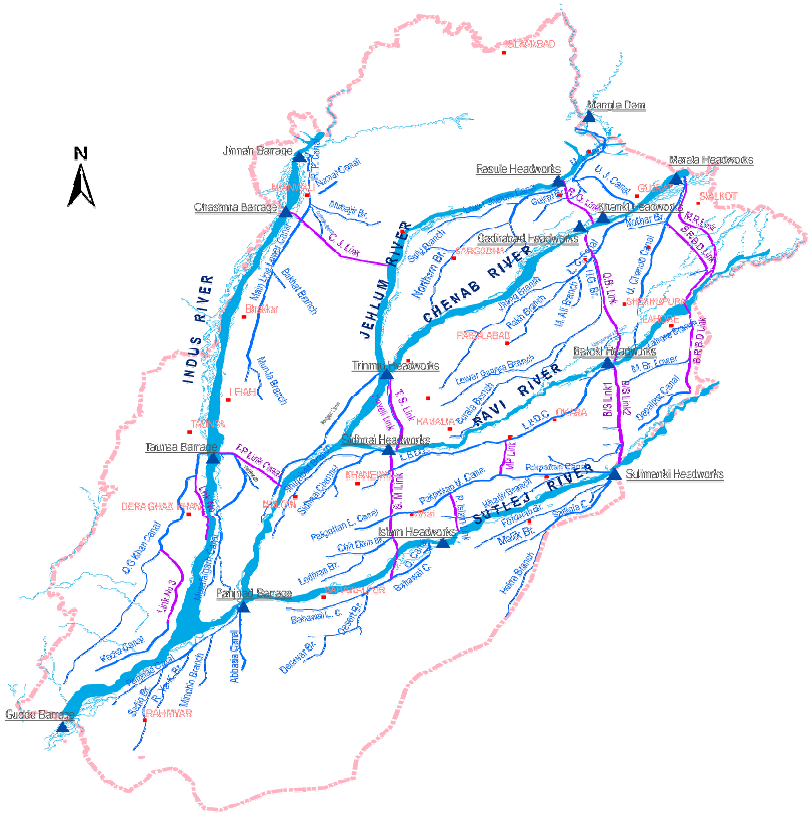
GOVERNMENT OF THE PUNJAB
PLANNING AND DEVELOPMENT DEPARTMENT
PUNJAB RESOURCE MANAGEMENT PROGRAM



DRAFT FINAL REPORT ON
MTBF RELATED SECTOR REVIEW
OF IRRIGATION AND POWER DEPARTMENT

(TA–2386 (PAK): Fiscal and Financial Management Reforms)

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ABBREVIATIONS

ADB	Asian Development Bank
ADP	Annual Development Program
AWB	Area Water Board
BCC	Budget Ceiling Committee
BCC	Budget Call Circular
C&W	Communication & Works
CE	Chief Engineer
CCA	Cultureable Command Area
CS	Cusecs
CMS	Complaint Management System
DDO	Drawing and Disbursing Officer
FD	Finance Department
FO	Farmers Organization
GW	Groundwater
I&P	Irrigation & Power
IRSA	Indus River System Authority
ISRP	Irrigation System Rehabilitation Program
KP	Khal Panchayats
KPI	Key Performance Indicator
M&R	Maintenance and Repair
MC	Management Committee
MTBF	Medium Term Budgetary Framework
MTDF	Medium Term Development Framework
MW	Mega Watt
NEPRA	National Electric Power Regulatory Authority
O&B	Operation & Budget
O&M	Operation & Maintenance
OFWM	On Farm Water Management
PADs	Provincial Agriculture Departments
P&D	Planning & Development Department
PGEIP	Punjab Government Efficiency Improvement Program
PIDs	Provincial Irrigation Departments
PIDA	Punjab Irrigation & Drainage Authority
PMIU	Program Monitoring and Implementation Unit
PMO	Project Management Office
PMU	Project Management Unit
PRMP	Punjab Resources Management Program
PSDP	Public Sector Development Program
R&U	Rehabilitation and Up-gradation
SC	Steering Committee
SCARP	Salinity Control and Reclamation Project
SDO	Sub Divisional Officer
SE	Superintending Engineer
SPRU	Strategic Planning / Reform Unit
TOR	Terms of References
WAPDA	Water and Power Development Authority
XEN	Executive Engineer

APPENDICES

Appendix-1 Key Inputs and Outputs – Current Budget

Appendix-2 Annual Development Program 2006-07 to 2008-09

Appendix-3 PSDP Allocations

Appendix-4 Budget Allocation and Utilization of M&R Works 2007-08 & 2008-09

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EXECUTIVE SUMMARY

Government of Punjab is implementing a Medium Term Budgetary Framework (MTBF) in Irrigation and Power Department under Punjab Resources Management Program with the assistant of Asian Development Bank (ADB) to improve fiscal and financial management, institutional development and private sector participation. Medium Term Budgetary Framework and Medium Term Development Framework mode of budgeting is being implemented to improve the planning and budgeting processes in Punjab. Medium Term Budgeting was initiated in 2009-10 in Irrigation and Power Department. The Department has prepared budgets for FY 2009-12 under MTBF mode and is in the second year of MTBF implementation.

The Sector Review is an integral part of budgeting process under MTBF as it provides a strategic focus to decision making process and provides link between the Department policy objectives and budgets & expenditures. Sector review of Irrigation & Power Department has been undertaken in the context of MTBF preparation as part of annual budget cycle. Irrigation Department policy objectives have been highlighted. The Department performance in meeting these objectives has been brought out. The assessment is made keeping in view the budget trends, sub-sector allocations and implementation issues.

Sector review of irrigation department reveals some good initiatives undertaken by the Department such as preparation of ten years asset management plan and zone specific yardsticks, strategic setting of prioritized investment needs, identification of financing windows, introduction of institutional reforms and participatory irrigation management regime, performance evaluation of irrigation service delivery by I&P Department Program Monitoring and Implementation Unit, performance evaluation and engineering audit of M&R Works by Third Party Consultants and recent appointment of Consultants for supervision of ADP Schemes . However, some gaps have also been analyzed and recommendations have been made to improve performance for achieving the departmental objectives.

The way forward recommendations based on the sector review analysis include:

- Need for Irrigation and water management system modernization
- Careful review of Development portfolio for its rationalization and efficient implementation
- Phased increases in abiana rates for financial sustainability
- Strategic review of institutional reforms process for making it more effective and efficient
- Improvements in irrigation service delivery
- Strengthening the performance evaluation and monitoring framework and TA support for linking it to the infrastructure investments
- Improvements in planning and execution of development schemes / projects and M&R works
- Continuity of the Third Party Engineering Audit system
- Introducing human resources management reforms for better career planning, capacity building and training of the staff
- Setting up dedicated and adequately staffed MTBF Cell in I&P Department
- Better planning of Foreign Aided / Mega Projects to avoid start-up delays

The Department has a Rs 10 billion ADP portfolio for FY 2009-10. In addition Rs 5 billion has been allocated under PSDP. However, the PSDP releases are far short of the requirements. As a result, the on-going projects are not timely funded, the completion of work is delayed, cost over-runs are being experienced, and the project benefits are not being realized. There is a need to take up the matter with

the Federal Government for expediting release of the needed funds to implement and complete the PSDP projects as planned.

Barrages rehabilitation and up-gradation is the priority need of deteriorated irrigation system. For implementation of mega projects capacity of the project management units in I&P Department need to be enhanced with particular focus on preparation of project planning and design, monitoring mechanism, procurement and financial management, safeguard policies and international donors policy guidelines.

In addition to the above, the need to develop a comprehensive performance assessment framework and linking it to the inputs of the current and development budget can not be over-emphasized. This is a challenging task and may require a phased approach for implementation. The existing performance monitoring system can be a good starting point in this regard and the Department needs to build on this. For this purpose, input of technical assistance training and capacity building would be required, which may be provided by PRMP.

1. MEDIUM TERM BUDGETARY FRAMEWORK

1.1 Background

Government of Punjab is implementing a Medium Terms Budgetary Framework (MTBF) which has been successfully pilot implemented in Irrigation and Power Department from FY 2009-10 covering budget years 2009-10, 2010-11 & 2011-12. MTBF, as the term itself implies, involves increasing the length of the budgetary cycle to more than one year, normally three years but can be four to six years. The multiyear budget horizon provides departments the space and flexibility they need to formulate, plan and implement policies that focus on service delivery or "outputs". Further more, public policy decisions generally take more than one year to implement therefore, it is important to adopt multiyear budgeting framework while determining resource determination and distribution function.

In multiyear budgeting, there is much greater emphasis on strategic planning. Strategy development includes a "top down" process since most policy decisions should be taken with involvement of top levels to determine organizational objectives. And at the same time plans should be developed to achieve those objectives. MTBF as such adds a "top down" dimension to the more traditional "bottom up" dimension of budgeting, for achieving a result orientation or output / outcome focus by involving the entire organization in the planning and budgeting process.

Punjab Resource Management Program (PRMP) was launched by Government of the Punjab with the assistance of Asian Development Bank (ADB) to improve financial management, institutional development and private sector participation. Medium Terms Budgetary Framework (MTBF) and Medium Term Development Framework (MTDF) mode of budgeting is being implemented in 5 line departments of Government of the Punjab, to improve the planning and budgeting in Punjab. Medium Term Budgeting was initiated in 2009-10 (as the first year) in Irrigation & Power Department. Irrigation & Power Department has prepared budgets for FY 2009-12 under MTBF mode and is in the second year of MTBF implementation.

Preparation of Department Sector Review (DSR) is an integral part of budgeting process under MTBF. It has been set out in the MTBF Budget Call Circular issued to MTBF Departments. The purpose of a Rapid Sector Review is to provide a strategic focus to decision making process and to provide link between the Department's policy objectives and its budgets and expenditures. The Sector Review involves an assessment of how policy objectives are defined and monitored with clear indicators of improved performance.

The objective of DSR is to review the link between Department's policy objectives and its budgets and expenditures. DSR is undertaken in the context of MTBF preparation as part of the annual budget cycle and involves as assessment of how policy objectives are defined, implemented and monitored with clear indicators of improved performance. The core of DSR is an assessment of whether the department's programs / projects and expenditures are supporting achievements of its policies. It covers both recurrent and development expenditures, looking at the composition of each and assessing the relationships between them.

Data analysis has been carried out for recent performance assessment of the department regarding progress in achieving departmental targets by indicators. The assessment is made to the extent to which required service levels are being met including the quality of the service delivery. Budget implementation constraints has been analyzed by assessing the budgets, releases and expenditures processes and feed-back received from Third Party Consultants for M&R works. Performance evaluation in the context of budget allocation and utilization, no. of contracts planned, awarded and completed during FY 2007-08 & 2008-09 has been reflected. Similarly, identified gaps and recommendations have also been highlighted in the report.

1.2 Objectives of the Study

The objective of DSR is to review the link between department's policy objectives and its budgets and expenditures. DSR is undertaken in the context of MTBF preparation as part of the annual budget cycle and involves an assessment of how policy objectives are defined, implemented and monitored with clear indicators of improved performance.

The core of DSR is an assessment of whether the department's programs / projects and expenditures are supporting achievements of its policies. It covers both recurrent and development expenditures, looking at the composition of each and assessing the relationships between them. The process provides strategic direction to the overall budget allocation process in the department. On completion it should be used by the department to form basis for sector allocations of resources in the medium term.

1.3 TORs of the Study

The TORS of the study are as under:

i) Description of sector objectives (provincial) e.g. policies and objectives, mission statement;

ii) Overview of key issues and challenges being faced by the sector (including projects / programs) in the medium and long term;

iii) Overview of the departmental priority programs and activities;

iv) Description and analysis of present functions and budgets within the provincial sector policy. Assess appropriateness of the activities of the provincial department in the sector;

v) Monitoring: description of responsibilities for setting and monitoring output indicators and the mechanisms that exist or are being developed for reporting this information; and

vi) Summarize provincial budgets and expenditures for FYs 2006-07 to 2009-10, disaggregated according to: current and development; and within major program, functional and economic classifications.

vii) Policy objective: a description of the policy area to be addressed and the specific policy objectives that are intended to be achieved over the MTBF period;

viii) Outcomes / outputs: a description of how progress is monitored against policy objectives. Assessment of monitoring indicators where they exist; and suggestion, time permitting, of indicators based on international experience where they do not.

ix) Described current performance: summarize the current provision of services in the policy area including:

- Recent and present output levels (progress in achieving targets by indicators); and
- Assessment of the extent to which required service levels are being met including the quality of service delivery.

x) Past expenditures: analysis of expenditure trends for 2005-06 to 2008-09 including comparisons of current to development expenditures, wages and salaries to non wage and salaries, the relation of expenditures to outputs (to the extend possible);

xi) Analysis of budget implementation constraints by assessing the budget, release, expenditure process;

xii) If possible as part of the pilot, projection of future trends of recurrent and development budgets based on existing policies, i.e. already approved projects, the transfer of recurrent costs of projects on completion to the recurrent budget.

xiii) Based on the analysis, comment on the strategic orientation (and re-alignment) of expenditures and their fit with policy objectives; and

xiv) Propose as an input to strategic budget discussions, options for high level reallocations / readjustments which would be expected to increase the allocative efficiency of expenditure and align expenditures more closely with policies over the period 2010-11 to 2011-12 and 2012-13.

1.4 Methodology of the Study

The methodology adopted for addressing the TORs is described as under:

i) **Review of Existing Studies / Financial Reports**

A review of existing studies/ reports was carried out for identification of Irrigation and Power Department sector objectives, vision and mission statement, functions of the department, financials and budgets and key water sector challenges.

ii) **Data collection**

The relevant data related to the study was collected from I&P Department, Operational Chief Engineers Offices and from other Departments / Consultants. The data so collected comprises of yearly current and development budgets, expenditures and throw forwards.

Data has also been collected on performance indicators for service delivery, monitoring and evaluation checks on expenditure and data regarding monthly and quarterly financial reviews. The information regarding future requirements of development and current budget and their basis of formulation and also sanctioned yardsticks of O&M and their basis have been reviewed. The information regarding revenue receipt of the department for the period 2005-2009 has been collected.

iii) **Analysis of Data**

Data has been analyzed to carry out recent performance assessment of the department regarding progress in achieving departmental targets by indicators. The assessment has been made to the extent to which required service levels are being met including the quality of the service delivery. The analysis has also been made for expenditure trends of 2006-07 to 2009-10 including comparisons of current to development expenditures, wages and salaries to non-wage and salaries and the relation of expenditure to outputs.

The implementation of development projects and the expenditures in mega project i.e., emergency rehabilitation and up-gradation of Taunsa Barrage, and the lessons learnt during implementation have been reviewed and attached in the form of a case study.

Budget implementation constraints have been analyzed by assessing the budgets, releases and expenditures processes.

iv) **Identification of Department Performance and Assessment of Monitoring Indicators**

An analysis has been made to identify the department performance for meeting its policy objectives that are intended to be achieved over the MTBF period. An assessment of monitoring indicators for outcomes / outputs against policy objectives has also been made.

v) **Department Strategic Review**

After data collection, analysis and review of the department for achieving the policy objectives and outcomes / outputs, a way forward has been recommended for strategic orientation of the expenditure and their fit with the policy objectives.

Recommendations have been made for cost recovery of current expenditures through suitable proposed increase in charges for service delivery by the department.

1.5 MTBF at Irrigation and Power Department

1.5.1 Medium Term Budgetary Framework (MTBF)

Medium Term Budgetary Framework (MTBF) is a multi-year approach to budgeting, which links the spending plans of government to its policy objectives in the medium term (usually three years). The multiyear budget horizon provides Departments the space and flexibility they need to formulate, plan and implement policies that focus on service delivery or "outputs".

1.5.2 MTBF Budget Call Circular

MTBF implementation in Punjab formally commenced in November 2008 with the issuance of MTBF Budget Call Circular (BCC) to Health and Irrigation & Power Departments ("Pilot Departments"). The MTBF – BCC provided line departments with indicative budgetary ceilings for next three fiscal years along with guidance and procedures on developing multiyear budgetary estimates. It provided specifically designed budget forms to support the spending units / DDOs prepare their budget estimates on a multiyear format. The forms developed were for both current and development budgets and included detailed instructions which were further reinforced with examples / scenarios to ensure maximum help to DDOs.

1.5.3 Oversight of MTBF Reforms

To foster greater interface between MTBF and MTDF, a set of joint protocols was agreed between Finance Department and P&D Department in September 2007. Under the Protocols, a three-tiered committee structure was proposed which comprises of:

- Steering Committee (SC)
- Management Committee (MC)
- Budget Ceiling Committee (BCC)

Steering Committee is an apex forum for approval of budget ceilings recommended by Management Committee (MC). Similarly MC has mandate to review and approve BCC recommended budgets, while BCC is mostly concerned with issuing preliminary budget ceilings to the departments and reviewing initial budget submissions in light of those budget ceilings. The Committees have representations from FD, P&D and pilot departments. In addition, there exists a MTBF Working Group consisting of Secretaries of FD, P&D and pilot departments. This Group was constituted in November 2008.

To oversee MTBF implementation activities and to interact with consultant team on a day-to-day basis, a core team comprising of key officials (budget and planning) from I&P Department was appointed which had the overall responsibility for institutionalizing and taking the reform process forward. Additional Secretary (Technical) heads to core team. To support MTBF implementation a team of consultants was deployed at I&P Department and Finance Department for ensuring smooth implementation.

2. OVERVIEW OF IRRIGATION AND POWER DEPARTMENT

2.1 Punjab Irrigation System

Punjab Irrigation System is one of the largest contiguous gravity flow network in the world. The surface and groundwater of the Indus Basin constitute vital lifeline of Punjab's agro based economy. Agriculture contributes 20 percent to Punjab's GDP and provides employment to about 45 percent of the labour force. Over 90 percent of Punjab's agricultural production is derived from about 21 million acres of irrigated land. Punjab's irrigation and drainage system, has an estimated replacement value of about Rs 1,200 billion which requires deferred maintenance of about Rs 145 billion (2005/06 estimates). Economic opportunities in the rural areas are still primarily limited to agriculture related activities. Continued growth in agriculture is, therefore, a key to the alleviation of poverty, which is significantly higher in rural areas as compared to urban areas.

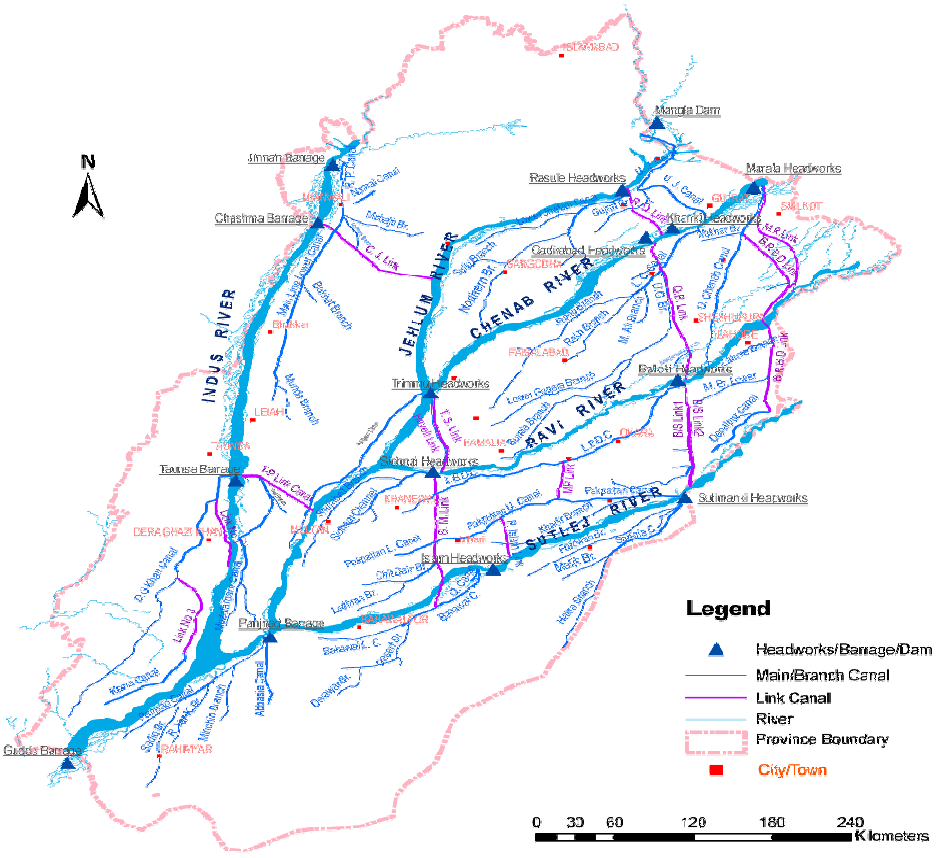

Figure 2-1 Map of Punjab Irrigation System

The irrigation system comprises 13 barrages / headworks and 24 main canals systems. The system is serving 20.78 million acres of culture-able commanded area through 58,000 outlets and has gradually achieved an average cropping intensity of over 125 percent. The salient features of Punjab Irrigation System are;

Table 2-1: Salient Features of Irrigation & Power Department

Headworks / Barrages	:	13
Main Canals	:	24
Length of Main Canals and Branches	:	3993 Miles
Length of Distributaries and Minors	:	19191 Miles
Off-take capacity of Main Canals	:	1.2 Lac cusecs
Off-take Capacity of Link Canals	:	1.1 Lac cusecs
Total Outlets	:	58000
Culturable Command Area	:	20.78 million acres
a. Perennial	:	12.94 million acres
b. Non-Perennial	:	7.84 million acres
Length of Flood Embankments	:	1600 Miles
Length of Surface Drains	:	4800 Miles
Small Dams	:	46 + 13

2.2 Major Functions of the Department

The major functions of the Department are as under:

Irrigation and Drainage

- Construction, maintenance and rehabilitation of barrages
- Construction and maintenance of canals
- Distribution of canal water
- Flood control and flood protection schemes
- Rivers and riverain surveys
- Drainage schemes
- Storage of water and construction of small dams
- Basic and applied research in irrigation, hydraulics, groundwater and land reclamation
- Assessment of water rates

Power Wing

- Administration of Electricity Act of 1910 & Electricity Rules 1937
- Administration of Section 38 of NEPRA Act, 1997 respecting dispute over metering, billing and tariff
- Assessment and collection of Electricity Duty under Punjab Finance Act 1964
- Development of Power Projects upto 50 MW capacity in public and private sector
- Reconciliation of electricity bills of Punjab Government's electricity connections and its allied agencies

Service Matters

- Recruitment of establishment
- Posting and transfers
- Staff promotions
- Accountability through application of E&D Rules
- Sanction of pension

Purchases

- Pumping Machinery for Lift Irrigation Schemes
- Purchase of Government Vehicles
- Gates and Gearings of all control points

2.3 Goals and Objectives

Irrigation management deals with the planning, organization, motivation and control of activities to achieve the purpose of irrigation. The activities in irrigation system management can be divided into three main categories: those focused on water, structures and organization.

Goals and objectives are the starting point of the most modern planning and management methods. These provide endpoints, which make it possible to determine the level of the success of an effort. Setting clear definition of goals and objectives, therefore, is central to the performance assessment of any institution or business enterprise.

The final goal of irrigation schemes should be to improve farmers' welfare through increased agricultural production. This can be achieved if the irrigation schemes are managed according to specific goals and objectives. These goals in ascending order of importance, include appropriate use of water, appropriate use of other agricultural inputs, remunerative selling of agricultural produce and improvement in social facilities.

The first step in irrigation management is to identify the interest groups with their respective objectives in irrigation. The main interest groups are the farmers, the irrigation agency and the government. Their common aim is to increase agricultural production, but the objectives might sometimes conflict. For example, individual farmers want enough water for optimal crop yield, but in the case of water scarcity, the government or the agency wants the water to be divided among all farmers equitably. The key objective in managing an irrigation and drainage system is to provide levels of service as agreed with the government, irrigation agency and farmers at the minimum achievable cost. The operational objectives of the Department are;

- Effective and efficient management of irrigation and drainage infrastructure.
- Equitable distribution of available canal supplies.
- Control of illegal water abstractions.
- Water resources development.
- Control of water logging and salinity.
- Flood protection of population centers, agricultural land and communication network, as well as the industrial and irrigation infrastructure.
- Revenue generation through efficient assessment of water rates.
- Resolution of conflicts related to the mutual water rights of the share-holders.
- Control of environmental degradation of land and water resources.

The irrigation system of the Punjab Province is mainly a run-of-river system with a limited storage capacity upstream in the system. Therefore, variability and shortage of surface water supplies are expected. The main objective of the canal operations is to achieve as much equity as possible, and to ensure supplies to tail-end farmers. The objectives of the water scheduling can be categorized as global and operational objectives.

Table 2-2: Global and Operational Objectives of Water Scheduling

System Level	Global Objective	Operational Objectives	Decision-making Authority
Reservoirs and Inter-provincial Canals	• Providing maximum water for agriculture and power generation • Flood and drainage control • Sustainability of the network	• Matching the water demand of different systems • Implementing the Water Apportionment Accord among the provinces	Water & Power Development Authority (WAPDA) and Indus Rivers System Authority (IRSA)
Main Canals	• Deliver water to the secondary system according to the design discharge • Maintenance of the main canals • Satisfy the demand of the secondary system	• Distributing the water shortages or excesses equitably • Minimize the operational cost	Punjab Irrigation Department (PID)
Secondary Canals	• Deliver water to the tertiary canal system according to the design rights • Take care of the environmental impacts • Increase productivity	• Distributing the water shortages or excesses equitably • Minimize the operational cost	PID
Tertiary System	• Providing Water to all cultivators on an equitable basis	▪ Following the authorized scheduling	Frequently the farmers, occasionally the PID

2.4 Organizational Setup

The Irrigation Department is headed by the Secretary, Irrigation and Power, under the direction of the Minister for Irrigation and Power. The Secretary is assisted by three Additional Secretaries and five Deputy Secretaries in charge of six wings, i.e., Administration, General, Operation, Budget, Development and Power, and an Officer on Special Duty (OSD). The secretariat has about 200 members as support staff.

Under the Secretary, there are 11 Chief Engineers (C.Es) who carry out various functions of the department. Six Chief Engineers have territorial jurisdiction over different parts of the irrigation system, while the remaining seven have functional duties. In addition, a number of Project Management Units have been established for implementation of Mega / Foreign Aided Projects. A Strategic Planning / Reform Unit has also been set-up in Irrigation & Power Department for spear heading the process of Strategic Planning and Institutional Reforms in the Department. The Chief Engineer, Research, is responsible for research in hydraulic problems and other allied fields connected with Soil and Water, and the Chief Engineer, Development, provides services such as excavation machinery and workshop facilities required in the field. The schematic representation of this organizational structure is depicted in Figure 2.2.

Each Zone headed by a Chief Engineer has a number of Circles, each under the charge of a Superintending Engineer (S.E), as depicted in figure 2.2. In each Zone, there are two to four Canal Circles, and some subject-specific Circles such as Drainage, Tube-Well Operation, and Link Canal, etc.

For operation and maintenance of a canal system, a Circle is further divided into two or three Divisions. An Executive Engineer (XEN) is in-charge of a canal Division under the administrative control of the Superintending Engineer. The Division is the basic executive unit for operational activities, and the Executive Engineer is the "kingpin" of the department. The engineers above him are controlling and directing officers, while engineers and staff under his supervision are to assist him in performing his field duties. On financial and accounting matters, an Executive Engineer, as Head of a Division, is independently responsible to the Audit Department. For this purpose, the Audit Department posts a Divisional Accountant as its representative to assist the Executive Engineer to maintain the accounts of the Division properly, and to exercise initial checks.

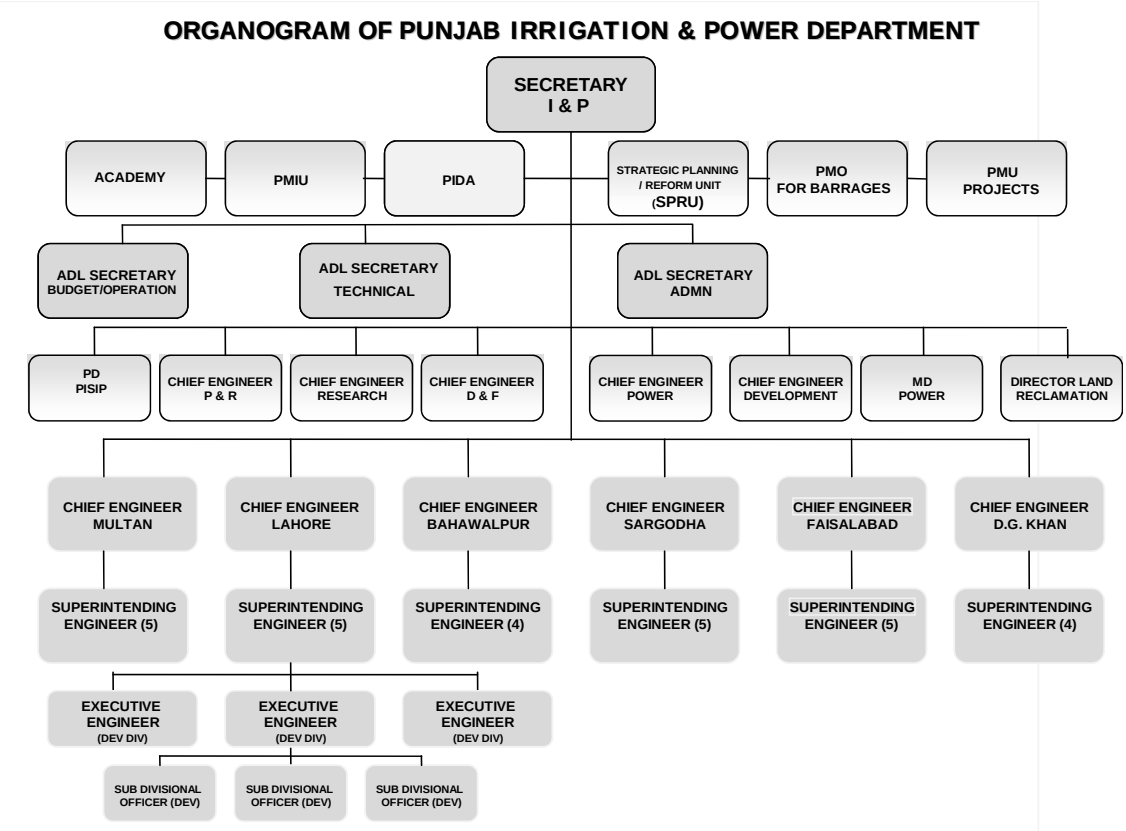

Figure 2-2: Organogram of Irrigation & Power Department

The sanctioned and working staffing strength of I&P Department is as under:

Table 2-3: Human Resources Profile of I&P Department

Sr. No.	Category	Sanctioned	Working Strength
1	Engineering / Professionals	792	656
2	Sub Engineer	1324	1021
3	Revenue	6868	4234
4	Beldar	11769	9275
5	Clerical	3873	3224
6	Technical / Non-Technical	12040	9770
7	Tubewells Operation Staff	6875	5419
	Total:	**43541**	**33599**

Source: Punjab Irrigation & Power Department

2.5 Vision

The vision of the Department is *"to provide adequate, equitable and reliable irrigation supplies to the cultivable lands of Punjab aiming at enhanced agricultural productivity and sustainable development with focus on holistic management and broad based institutional reforms"*.

2.6 Major Irrigation Sector Challenges in Punjab

Currently Punjab faces several irrigation and drainage challenges with profound social economic and environmental implications. The major water sector challenges include:

- Growing water shortage
- Progressive deterioration of irrigation infrastructure
- Low water productivity
- Over exploitation of groundwater
- Lack of holistic management strategies
- Lack of transparencies and equities in water distribution
- Lack of financial sustainability and increasing gaps between revenue and operational & maintenance costs
- Gaps in governance and trust

2.7 Relationship and Linkage with Federal Government Functions

A multitude of state agencies and departments shares responsibilities for the management of irrigated agriculture in Pakistan. The broad division of responsibilities between irrigation and agriculture starts at the federal level, with two separate ministries, and runs through the sector's whole structure up to the farm level. Irrigation management in Pakistan, thus, follows a segregated organizational structure.

The Water and Power Development Authority (WAPDA), linked with the Federal Ministry of Water and Power, is an autonomous agency responsible for the development of water resources in the country.

WAPDA manages the storage dams and operates these in consultation with the Indus River System Authority (IRSA) and Provincial Irrigation Departments (PIDs) according to the water rights and seasonal allocations of the provinces. WAPDA has also been responsible for the construction of the Indus Basin Project Replacement Works, installation of tubewells in various SCARPs, and installation of drainage projects throughout the country. After the construction of barrages, link canals, tubewells and other drainage schemes by WAPDA, the responsibility for their operation and maintenance is transferred to the PIDs.

The major responsibility for irrigation system management rests with the PIDs, and some of its elements are with Provincial Agriculture Departments (PADs). PIDs undertake some construction works, but primarily attend to the O&M of irrigation facilities, extending from barrages and main canals to outlets, upkeep and maintenance of drainage and flood works, assessment of water charges, and resolution of conflicts among water users. On-Farm Water Management (OFWM) Directorates carry out watercourse lining and on-farm water management, while PADs are responsible for agricultural research, extension and productivity enhancement. On the other end, farm level decisions regarding application of water and non-water inputs are made by the individual farmers. A host of complex factors and the external environment impinge farmers' performance and decision-making processes.

2.8 Federal Government Future Water Sector Strategy

The water sector strategy centers around three important elements i.e. water augmentation, water conservation and efficient water use. In this context a comprehensive set of measures for the development and management of water resources are to be formulated and effectively implemented. This includes the development of additional medium and large-size reservoirs, integrated resource use, the introduction of water efficient techniques, containments of environmental degradation, institutional strengthening, capacity building and human resource development, new priority water storage dams.

The Federal Government in their review of MTDF for the period 2005-10 has indicated the following challenges for irrigation / water sector at national level:

- Low water storage capacity and its continuous deterioration due to reservoir sedimentation.
- Impartial assessment of optimal downstream Kotri outflow to the sea and national consensus on building of new reservoirs and water distribution.
- Low overall irrigation efficiency and inefficient water use at the farm level.
- Excessive extraction of groundwater and use of poor quality water for irrigation.
- A national water quality management program to monitor quality and enforce standards for disposal of effluent discharge into rivers lakes, and streams

2.9 Future Development Action Plan

Cognizant of the aforementioned challenges, the Government is following a strategy to provide adequate, equitable, and reliable irrigation supplies to the cultivable lands of Punjab aiming at enhanced agricultural productivity and sustainable development with focus on holistic management and broad based institutional reforms. The future program for development is as under:

- **Urgent need for construction of major new storages on the River Indus**
  Irrigation system is under stress as a result of growing demand and declining water availability per capita, with increasing population, and depleting storage capacity due to gradual silting up of existing reservoirs. The need exists for construction of new storages / larger reservoirs in order to cope with the above challenge. Construction of large storages /

reservoirs however falls in the domain of Federal Government. Recently, the Federal Government is pursuing the construction of Diamer Bhasha Dam Project.

- **Priority need for Rehabilitation and Up-gradation of barrages**
  Punjab barrages play vital role in sustaining supplies to the irrigated lands in the province. These barrages are serving since last 50 to 110 years. Most of these structures have outlived their life and need rehabilitation. Irrigation Department has planned to rehabilitate and modernize the century old barrages in a phased program. Taunsa barrage, the most critical barrage was taken up first on priority during April 2005 with the financial assistance of the World Bank and the project has since been completed ahead of the schedule completion date. Similarly, Jinnah and Punjnad barrages on Indus River, Trimmu barrage at Jhelum and Chenab River, Khanki at Chenab River, Balloki at Ravi River, and Sulemanki & Islam at Sutlej River have been identified for prioritized investment.

- **Modernization and Rehabilitation of Water Distribution**
  Irrigation distribution system was designed to distribute water with minimum human interference, and at low operation costs with minimum information and communications. There are few structures to regulate flow, no escapes to remove excess flows, and for example, outlets run whenever the distributary or minor is running. These design and operation principles were suitable for low cropping intensity but are now constraints on water management to maximize crop production and productivity.

  The selection of canal reaches to be lined is an important area specific issue which requires an integrated approach. In the past, sporadic efforts have been made to rehabilitate parts of the canal network, or to improve drainage here and there, but in the absence of a comprehensive and integrated approach, effective farmer participation, and other changes upstream and downstream including improvements in O&M, these efforts have not led to overall improvements in either physical or economic performance.

  The current state of the irrigation system clearly brings out the need for its improvement. Regardless whether additional water is made available at the canal head in the future or not, the imperative will remain to make optimal use of all water resources, both surface and groundwater, within the canal command and the drainage area.

- Irrigation Sector has to invest simultaneously in infrastructure and in developing the institutions required for the sustainable management of increasingly scarce water

- **Institutional Reforms**
  Institutional reforms process is underway in irrigation sector in the Province. The reforms are basically aimed at better governance, de-centralization, and farmers' participation in management, efficient water management and sustainability. Go Punjab is aware of the challenge and institutional reforms have been introduced in irrigation sector with the promulgation of Punjab Irrigation and Drainage Authority in 1997, five Area Water Boards notified: LCC (E) & (W), LBDC, DG Khan, and Bahawalnagar. LCC (E) AWB functional since 2007. 184 Farmers Organizations formed in the above AWBs. Necessary legal framework for formation of FOs has been issued.

  The farmers based entities include the following;

  - Punjab Irrigation and Drainage Authority **'PIDA'** at Provincial Level.
  - Area Water Board **'AWB'** at main canal level.
  - **'Farmers Organizations'** established at distributary level
  - **'Khal Panchayat'** formed at each water course level

- The 'Khal Panchayat' consists of one Chairman and four members, elected out of the Farmers/Shareholders of the concerned water course. The farmer has been defined in Rule 2 (e) of PIDA (Pilot FOs) Rules 2005.
- The Chairman of Khal Panchayats constitutes the General Body of 'Farmers Organizations'. The General Body elects the 'Management Committee' of Farmers Organization, which is responsible for functioning of the FOs. The Management Committee consists of 4 office bearers and 5 executive members, out of which 3 are from tail reaches.
- The PIDA (Pilot FOs) Rules 2005 and concerned Regulations are applicable for establishing FOs in various Canal Systems.

- **Groundwater Management**

  Groundwater has become a vital and major part of the overall Indus Basin irrigation system. As the limits to its development are approached, an effective monitoring and regulatory system that encourages the continued management of this water source, but ensures that it is sustainable, is urgently needed. The Government's most important management instrument for groundwater, apart from a greatly improved knowledge base and information system to support better monitoring, is to properly regulate and price water in the agriculture sector.

  Groundwater use in the Indus basin has more or less reached the upper limit and there is very little potential for a further increase. While estimates of total availability vary over a significant range regardless which estimate one subscribes to, the difficulty of approaching the limit in the presence of saline water adjacent or below the freshwater zone when nearly all groundwater is developed privately requires that planning assumptions be conservative given today's limited knowledge and information base and the lack of a management system. Because of the presence of highly saline water in the aquifer over large areas including below the fresh water in some cases, there is a grave risk of rapidly increased water quality deterioration and soil degradation as the safe limits of development are approached, and in some areas there is a risk of a reversal and loss of this valuable source of water because of lateral and vertical intrusion of brackish groundwater into fresh aquifers.

  The urgent need for provision of water and sanitation facilities to the urban and rural areas of Punjab is recognized. There is a need to invest for municipal and industrial wastewater in order to address the environmental challenges. The interventions however need to be planned and implemented in a holistic manner with the active support of all the stakeholders. Environment Protection, WASAs, Housing - Urban Development and Public Health Engineering, Irrigation and Industries Departments along with private organizations have important role for management of the above challenge.

2.10 Irrigation Water Pricing

In colonial era, the irrigation revenues apart from covering full O&M costs also used to finance the capital cost of irrigation schemes in Indus Basin. However, with the passage of time revenue started to decline as water rates could not keep pace with the rising inflation. At present, the revenue collections finance only 30 – 35% of the O&M expenditures in Punjab. A new system of flat rate abiana assessment was introduced in 2003 to make the pricing system simpler and more transparent for the farming community. Despite low level of water charges, it remains to be a sensitive socio-political issue and even minor increases in the rates are strongly debated and challenged at every forum. In this backdrop, the strategies for water pricing, cost sharing framework and participatory management regime have to be evolved thoughtfully.

The declaration of the pre-independence government of the Punjab was that it was the government's duty to see that the burden on canal water users is no heavier than they could afford. Irrigation water has always remained a critical, but low-priced input in the agriculture sector. Only in the interest of

farmers welfare have water rates not been increased commensurate with rises in rates of other commodities. The key determinants for setting water rates are the cost of providing irrigation water, the benefits derived from irrigation, beneficiaries to pay water rates and opportunity cost of various sources. The parameters for water pricing policy may include revenue needs of the system, equitable distribution water and its cost, incentive for efficient use of water and capital, simple tariff rate structure and environmental considerations. The successive increases in water charges for major crops are presented below:

Table 2-4: Successive Increases in Water Charges of Major Crops in Punjab

Year	Increases in *Abiana*
1977-78	25 %
1980-81	25 %
1981-82	25 %
1993	25 %
1994	10 %
1995	10 %
1996	37.5 %
1997	10 %
1998	10 %
2003-2008	Flat Rate System

Source: Punjab Irrigation & Power Department

The abiana assessment and collection trends for the period 1990-91 to 2007-08 are presented below:

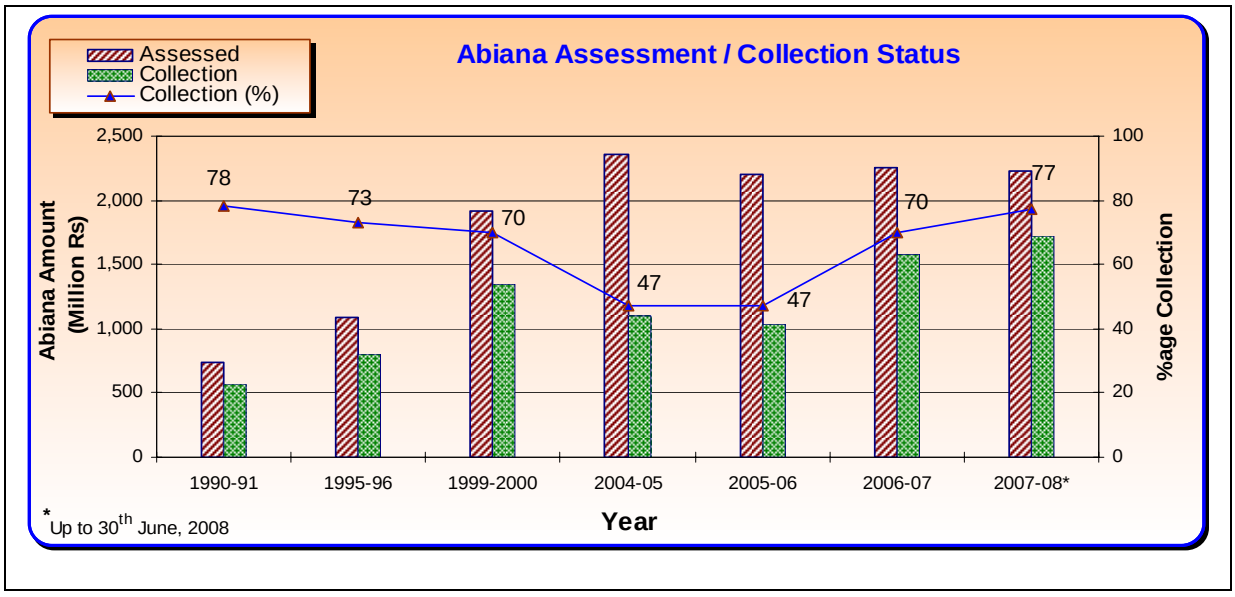

Figure 2-3: Abiana Assessment / Collection

In addition to water rate increase, there is large scope to revise and update the rates for non-irrigation use of canal water as well as rates from special supply rates of sanctioned fish farms and garden areas. The rates for allowing treated waste water and industrial effluents into drainage system are also very low and need to be increased commensurate with the service being provided.

2.11 Summary of Budgets and Expenditures for FY 2006-07 to 2009-10

2.11.1 Departmental Budget and Provincial Budget Outlay

From 2006-08 there appears to be a slight increasing trend in Irrigation and Power Department's total budget allocations in comparison with total provincial budget outlay. However, there is a declining trend with I&P Department's total budget allocation for 2009-10 at Rs 18,597 million which is 3.80% of Provincial budget outlay of Rs 489,873 million compared to 4.49% of the Provincial budget outlay in 2008-09.

A further split of similar analysis into current and development budget reveals some interesting trends. Current budget is showing declining trends whereas the development budget increased from 2006-07 to 2007-08 before declining straight through 2009-10.

Table 2-5: Current and Development Budgets 2006-07 to 2009-10

(Rs Million)

Description	2006-07	2007-08	2008-09	2009-10
I&P Budget	14,781	17,943	18,727	18,597
- Current	6,131	6,793	7,425	8,597
- Development	8,650	11,150	11,302	10,000
Provincial Budget	338,194	393,487	417,000	489,873
- Current Revenue Expenditure	191,378	243,487	257,000	314,873
- Development Expenditure	117,207	150,000	160,000	175,000
I&P Budget as (%) of Total Provincial Budget Outlay	4.79	4.56	4.49	3.8
I&P Current Budget to Provincial Current Budget Outlay (%)	3.20	2.79	2.89	2.73
I&P Development Budget to Provincial Development Budget Outlay (%)	7.38	7.43	7.06	5.71

Source: Punjab Irrigation & Power Department

The total budget for 2006-07 to 2009-10 and provincial budget outlays are presented below:

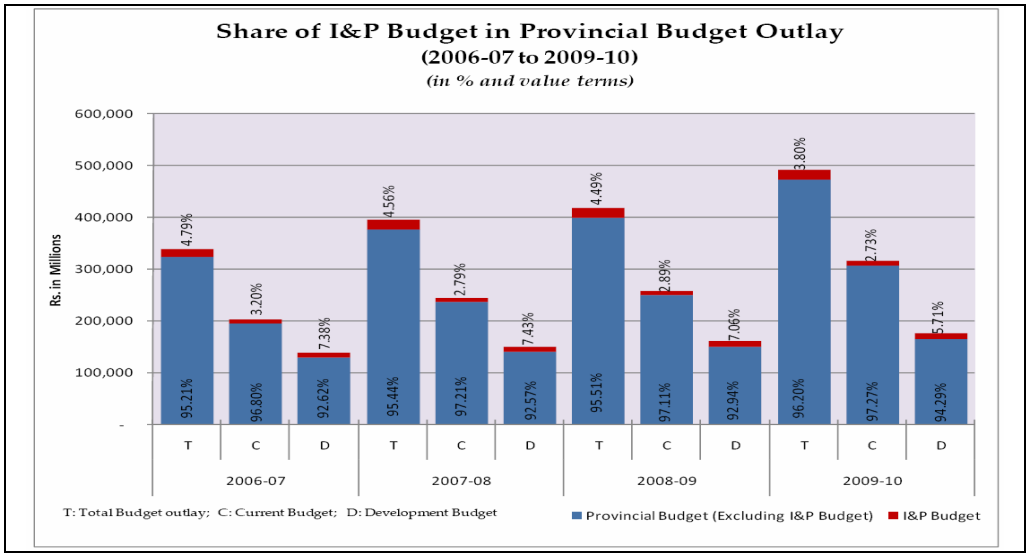

Figure 2-4: Share of I&P Budget in Provincial Budget Outlay (2006-07 to 2009-10)

2.11.2 Sector-wise ADP allocations for 2009-10

Sector wise allocation of funds for ADP 2009-10 is shown below;

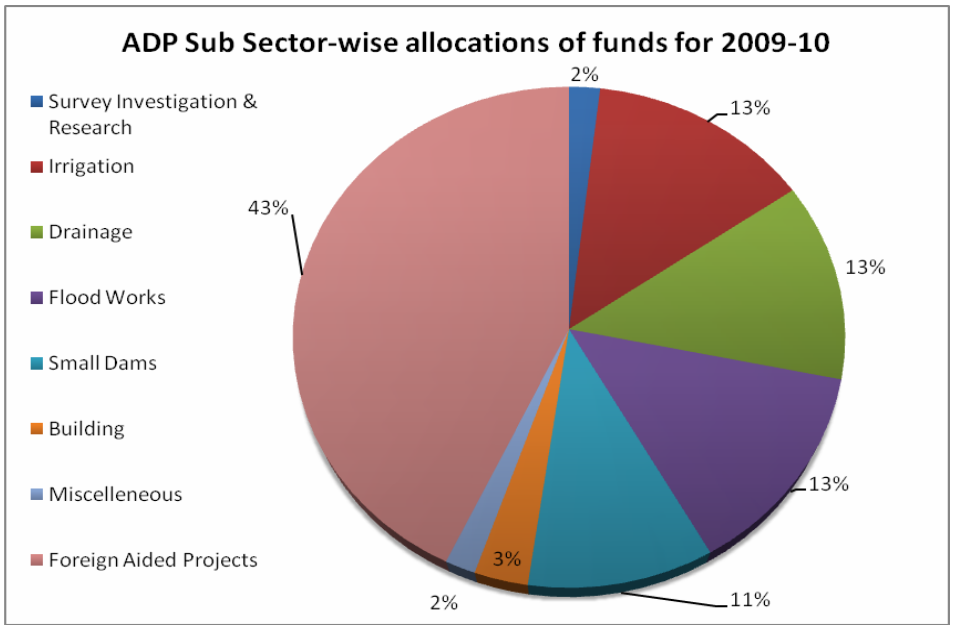

Figure 2-5: ADP Sub Sector-wise Allocations of funds for 2009-10

2.11.3 ADP Allocations for new and ongoing schemes for 2009-10

Sector-wise allocation of funds for ADP 2009-10 for new and on-going schemes are given below;

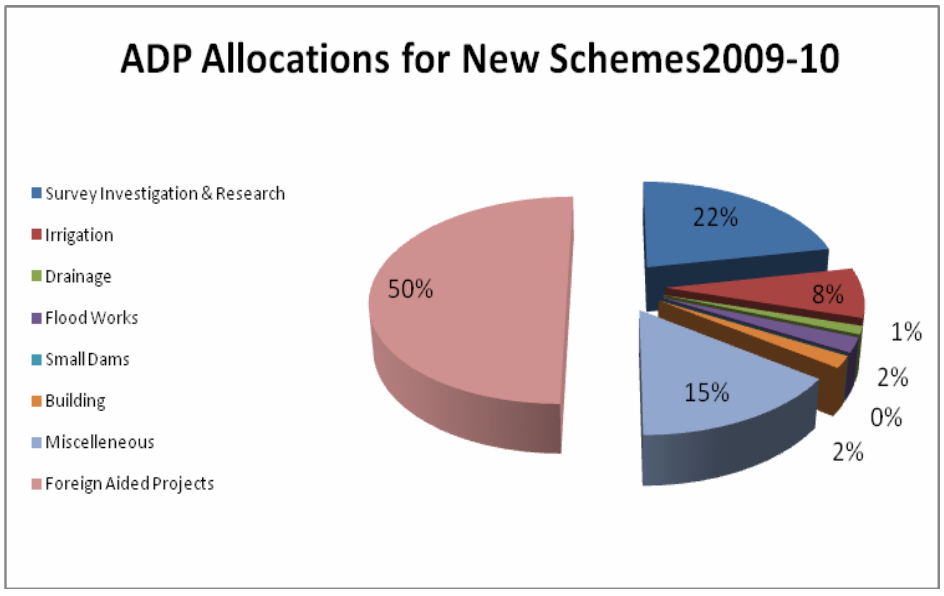

Figure 2-6: ADP Allocations for New Schemes 2009-10

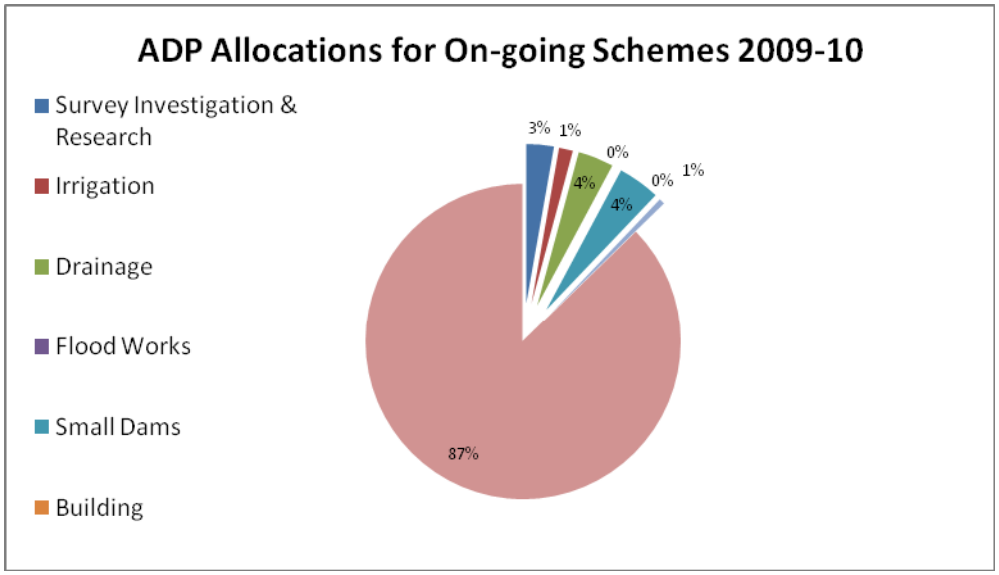

Figure 2-7: ADP Allocations for on-going Schemes 2009-10

2.11.4 Object wise O&M Expenditures

The object wise O&M expenditures for 2007-08 and 2008-09 are shown below:

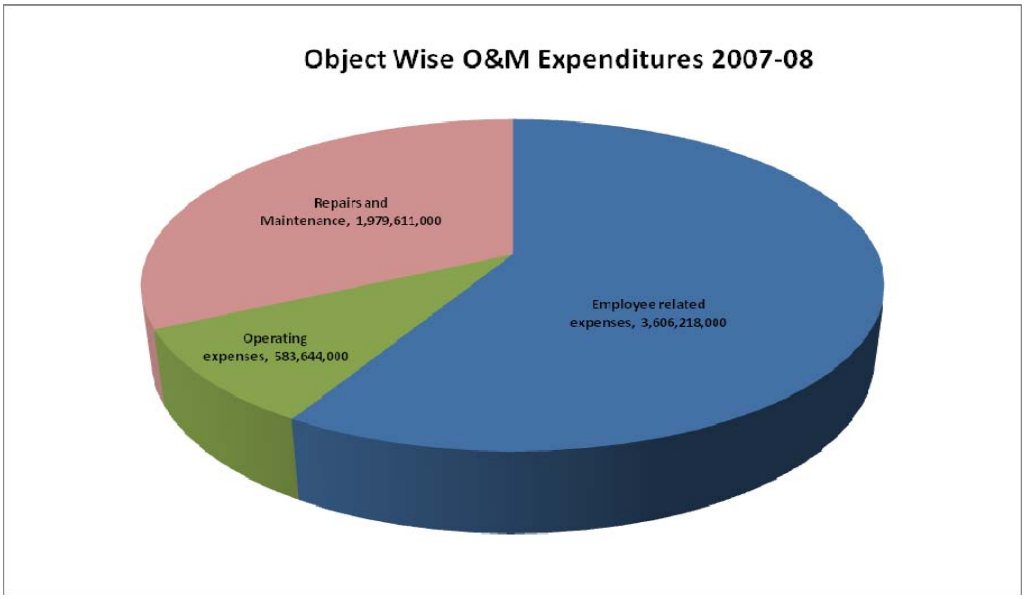

Figure 2-8: Object-wise O&M Expenditures 2007-08

2.11.5 Object Wise O&M Expenditures 2008-09

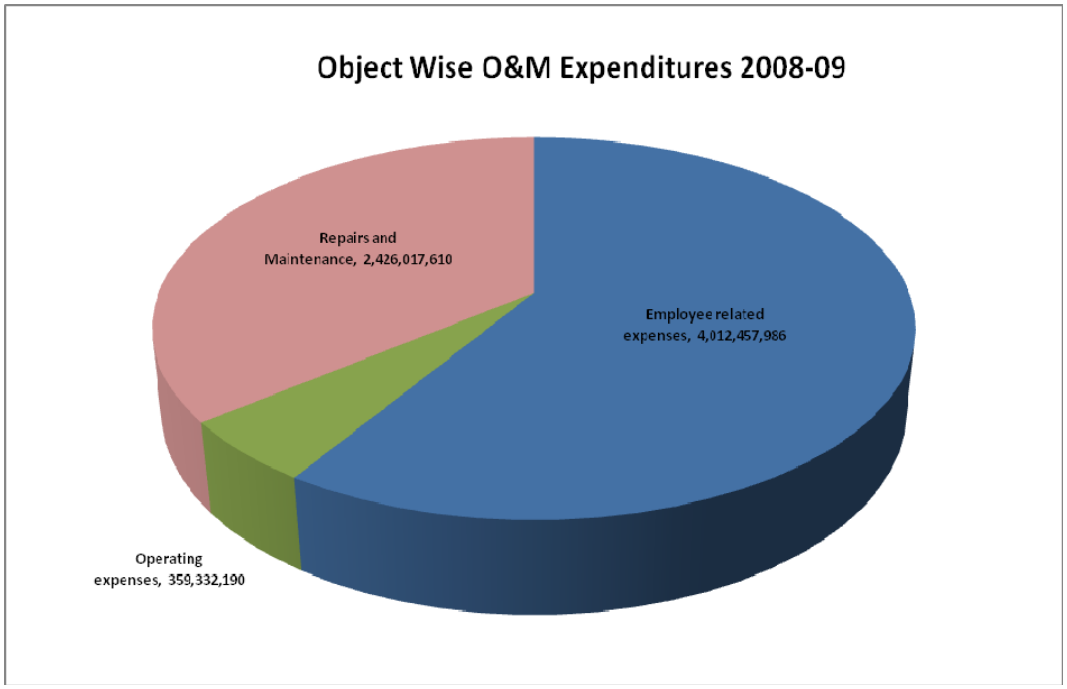

Figure 2-9: Object-wise O&M Expenditures 2008-09

2.11.6 Sub Sector Wise Allocations of O&M Funds 2009-10

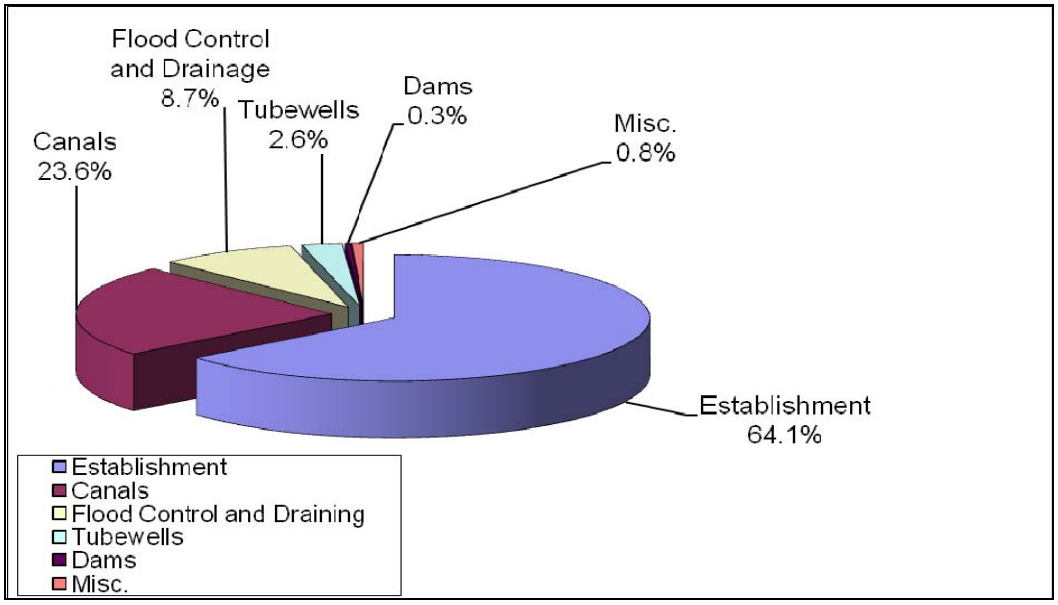

Figure 2-10: Sector-wise Budget of I&P Department

2.11.7 Nature of M&R Expenses for a Typical Main Canal

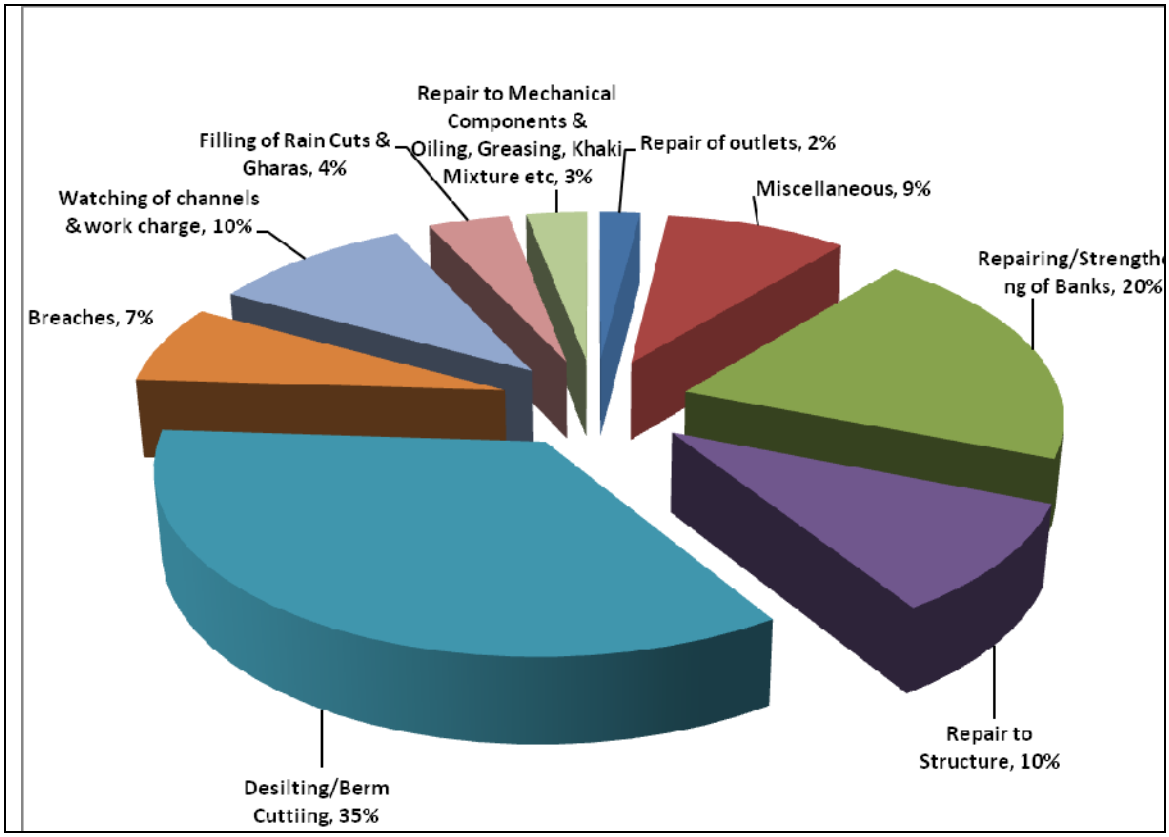

Figure 2-11: Nature of M&R Expenses for a Typical Main Canal

3. PERFORMANCE AND MONITORING FRAMEWORK

3.1 Assets Management Plan

Cognizant of the afore mentioned challenges and as part of Punjab Irrigation Sector Reforms Program during the early part of year 2005, Irrigation & Power Department prepared an inventory of its assets both irrigation and drainage infrastructure as well as for supporting assets and undertook an analysis of the inventory. In accordance with the framework of procedures and techniques employed in preparing an asset management plan the purpose of inventory and its analysis was to identify the assets, assess their values and the liabilities. The analysis of the inventory included (i) technical specifications; (ii) historical and replacements costs / values; (iii) physical condition with rating 1-5 (nonfunctional to proper working order); (iv) estimated annual O&M cost (establishment and variable M&R costs); and (v) cost of rehabilitation and up gradation.

Asset Management planning is the process of establishing the condition of infrastructure as a basis for evaluating the level of investment required to maintain or enhance its condition and utility. Good management of assets results in increased longevity and sustained utility of the infrastructure and an enhanced level of service provision to the water user.

The introduction of Assets Management into irrigation is seen as having the following aims:

- ✓ To help achieve more cost-effective management of the infrastructure. To this end, to enable managers to make better-informed investment decisions which have a clear basis of justification and which can be audited or replicated.
- ✓ To facilitate turnover of assets from government control where desired.
- ✓ To provide a cost-effective technique for calculating irrigation service charges based on a realistic assessment of the costs of sustaining the supply of water.
- ✓ To facilitate comparative performance assessment.

As summarized below, the assets of the department have an overall estimated Replacement Value Rs 1,170,311 million (about US$ 19505 million), which gives a unit cost of Rs 139,323/ha (US$ 2322/ha) over the entire CCA of 8.4 Mha. The cost does not include the proportionate cost of storage reservoirs (Tarbela, Mangla and Chashma) as well as the cost of on farm works and cost of colonization etc.

Table 3-1: Replacement Costs of I&P Department Assets (2005)

Sr. No.	Asset	No./Length	Replacement Value (Million Rs.)
1	Headworks / Barrages	13 No.	104,859
2	Main Canal Systems	22 No.	523,505
3	Distributaries and Minor Canals	2794 No.	331,186
4	Inter-river Link Canals	10 No.	85,000
5	Tubewells Fresh GW	1133 No.	1133
6	Tubewells Saline GW	2411 No.	2411
7	Surface Drains	9856 Km	64,972
8	Subsurface Drainage	50,000 ha	2,700
9	Flood Embankments	3228 Km	13,468

Sr. No.	Asset	No./Length	Replacement Value (Million Rs.)
10	Spurs	650 No.	
11	Small Dams	33 No.	5,313
12	Lift Schemes	41 No.	1449.70
13	Buildings	Several	9,106
14	Lands		20,261
15	Machinery	242 No.	3,256
16	Workshops	2 No.	327.40
17	Vehicles	565 No.	735
18	Stores	Misc	629
Total:			**1,170,311**

The rehabilitation and improvement works are ongoing through the provincial, federal and foreign financing. It is envisaged that the financing of rehabilitation and improvement works as part of Assets Management Plan would be made through the various sources. Based on the existing conditions of irrigation infrastructure and keeping in view the policy adopted by Irrigation & Power Department about preparing the rehabilitation plans, the estimates of rehabilitation works are prepared. The projects and corresponding financing windows for the next ten years are given below:

Table 3-2: Financing Windows for Next Ten Years

Financing Windows	Amount (Billion Rs)	Projects
JICA/JBIC	14	LCC (Part B) & PISIP (Punjab Irrigation System Improvement Project)
ADB	72	LBDC, Thal/Pakpattan/Sidhani canal systems, Balloki, Sulemanki, Trimmu & Panjnad Headworks
WORLD BANK	16	Jinnah & Islam Barrages
PSDP (ISRP and Lining)	24+40	Khanki Barrage Reconstruction Irrigation System Rehabilitation Project (Lower Jhelum Canal, Eastern Sadiqia, Hakra Branch, Punjnad Canal and SMB Link) & Lining of Distributaries / Minors
ADP	40	Counterpart Funding and rehabilitation of existing infrastructure
TOTAL	**206**	

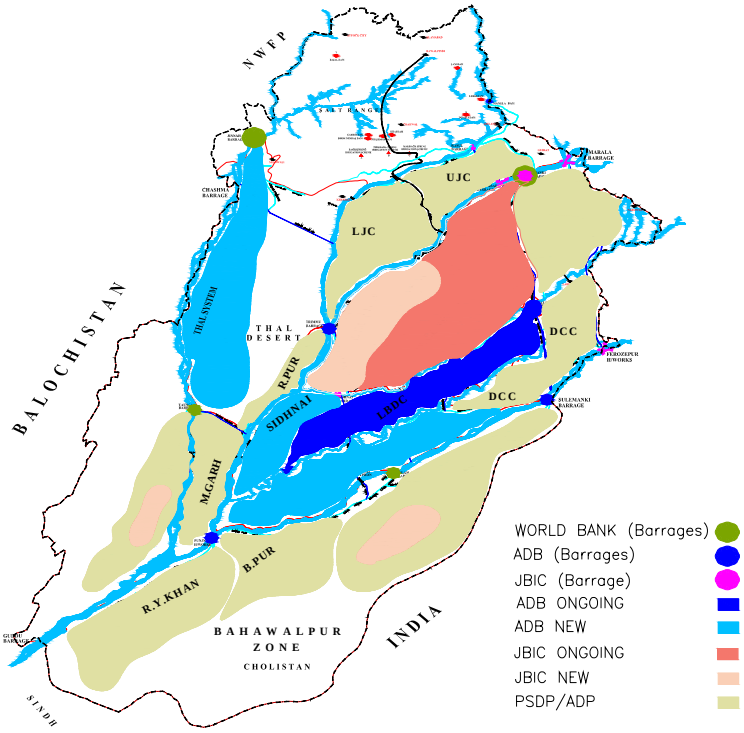

Figure 3-1: Financing Pattern of Rehabilitation of Irrigation Infrastructure

3.2 Planning & Budgeting Process in the Department

In I&P Department, current and development budgets are processed, executed and monitored by separate sections. Additional Secretary (O&B) is responsible for current budget and is assisted by a Deputy Secretary (Ops) and Section Officers. Similarly, additional Secretary (Technical) is incharge of development budgets and is assisted by Deputy Secretary (Development) and Program Officers.

Current budgets are prepared at Division, Circle and Zonal levels, Directorates and I&P Headquarters. Budgets prepared by Executive Engineers at the Division levels are submitted to their relevant Circle Offices where they consolidated. After consolidation at the Circle Offices they are submitted to the respective Zones who are responsible to send them to I&P Headquarter.

At Division level, current budgets are prepared in three parts i.e. (i) maintenance and repairs, (ii) drainage and flood control, and (iii) revenue functions. Total number of budgets submission from all spending units of I&P is around 325, which are consolidated at various levels. Due to the consolidation, the number of published budgets gets significantly reduced. O&M budget break down for FY 2009-10 is given below:

Table 3-3: O&M Budget Break-down for FY 2009-10

Cost Center	Allocation (Rs. in Million)
Establishment	**5508**
O&M	**3088**
Canals	2030
Flood Control and Drainage	745
Tubewells	220
Dams	28
Misc.	65

Source: Punjab Irrigation & Power Department 2009

The process of budget formulation for development budgets begins with issuance of draft budget ceilings by Planning and Development Department. These ceilings are for the department as a whole which are further subdivided to development schemes (new and ongoing) after a consultative process internally (within the department) and externally (with P&D Department). The development budget estimates are formulated for each scheme separately. The function of formulating, finalizing and conveying development budget estimates is performed by Deputy Secretary (Development). Scheme wise ceilings once discussed, approved and finalized are conveyed to the field formation i.e. Zonals, Canal Circles and Division Offices.

3.3 Priorities in the Medium Term (2009-12)

The department views following to be the key priorities in developing budgetary estimates over the medium term (2009-12):

Current

- Maintenance and repair of canal structures;
- Operational safety;
- Improved equity through desilting operations.

Development

- Strengthening and up gradation of canal structures and lining;
- Institutionalization, monitoring and surveillance of canal operations;
- Construction and up gradation of small dams.



Figure 3-2: Layout of panels of concrete lining of a disty and completed section of concrete lining



Figure 3-3: Desilting of Distributaries

3.4 MTBF Allocations and Policy Objectives

Implementation of efficient and optimal canal operations is very important to meet the departmental objectives towards equity and transparency. I&P Department policy objectives are aligned with irrigation service delivery and equitable distribution of water. Key inputs, outputs and outcomes for canals, drainage, and flood control have been attached at **Appendix-1**. The policy objectives along with budget estimates are given below.

Table 3-4: Policy Objectives and Budget Estimates 2009-10 to 2011-12

(Rs. Million)

Policy No.	Policy Objective	Budget Estimates 2009-10		Budget Forecast 2010-11		Budget Forecast 2011-12	
		Current	Develop-ment	Current	Develop-ment	Current	Develop-ment
Policy No.1	Provide adequate, equitable and reliable irrigation supplies to the culture-able lands.	5157	7401	5580	10438	5998	11604
Policy No.2	Extend and improve drainage, flood protection, hill torrent management and command area development interventions in revering and rain-fed (Barani) areas	1118	2480	1193	1052	1274	889
Policy No.3	Implement measures to reverse environmental degradation and groundwater mining	1291	5	1413	10	1548	7
Policy No.4	Introduce broad based institutional reforms aiming at transparency, efficiency and autonomy to sustain the resource base and infrastructure	905	0	1000	0	1106	0
Policy No.5	Support Irrigation functions by undertaking planning & research activities	126	0	139	0	153	0
Policy No.6	Augment renewable energy resource base through installation of low-head hydel stations on canal falls.	0	114	0	1000	0	1500
Total:		**8597**	**10000**	**9325**	**12500**	**10079**	**14000**

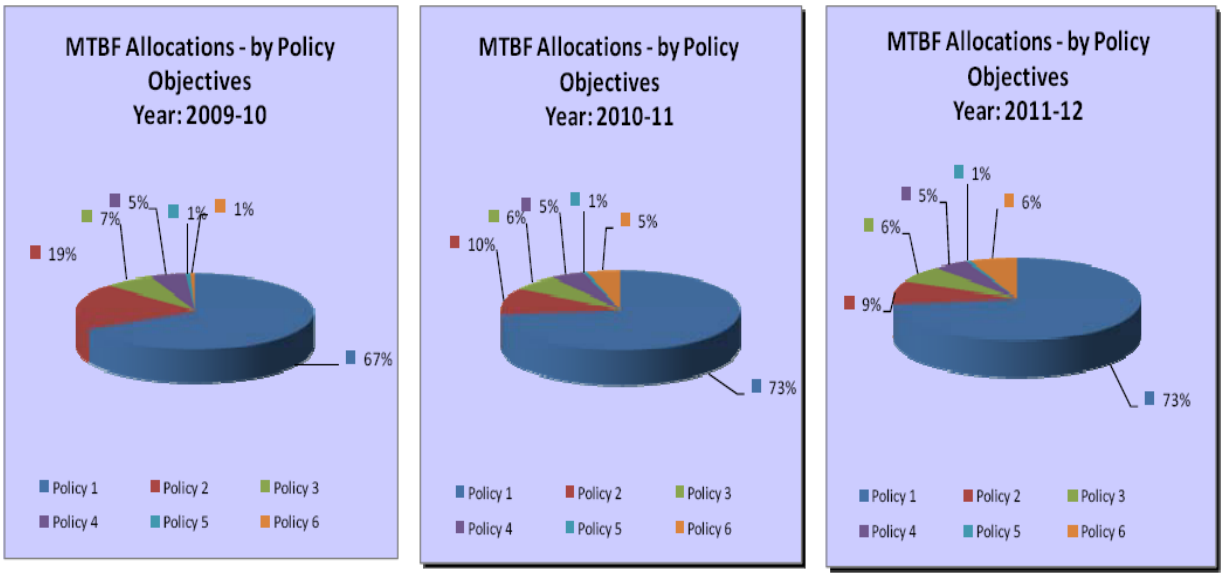

Figure 3-3: MTBF Allocations – by Policy Objectives (2009-10 to 2011-12)

3.5 Framework for Performance Assessment

The performance of a system may be defined as the acquisition of inputs, and the transformation of these inputs into intermediate and final outputs, as well as the effects of these activities on the system itself and its environment. The performance of a system is represented by its measured levels of achievement in terms of one, or several, parameters, which are chosen as indicators of the systems' goals. Important aspects in performance assessment are those of scale and audience. The irrigation management impacts the water delivery system up to the national level. The level of achievement can have different contexts and implications according to the perceptions and objectives of the reference level. Another point of interest is that of change in performance expectations over time. An effective management system, therefore, needs to adjust to the changes, both within the system itself, as well as in the external environment.

Generally, the monitoring of performance assessment is categorized into three types as given below:

- Operational Performance Monitoring
- Accountability Assessment
- Intervention Assessment
- Environmental assessment

The operational performance monitoring is done through checking of discharges of the network. The scheme managers need a consistent and continuous inflow of data to enable them to decide on operational matters. The data include river discharges and reservoir levels, water levels and discharges at various regulation points in the off-taking canals, cropped area, climatic and hydrological data, and water demands. The accountability assessment can be applied to the internal processes of the irrigation organization, the relationship and procedures of the Public Accounts Committees, and the relationship between irrigation agencies and the farmers. For accountability assessment to be fair and objective, the active participation of the various interest groups at different levels needs to be institutionalized. The intervention assessment deals with monitoring of strategic interventions in the system, and is undertaken to determine the ways and means to improve some aspects of the scheme's performance. This may range from modest changes in water distribution procedures to major institutional reforms. The intervention

analysis involves assessment of scheme performance at a given time, evaluation of the performance with a view to identifying constraints in effective management, and taking appropriate corrective action.

Irrigation management experts point out that evidence of an effective performance assessment framework, which would help management to evaluate and improve overall performance is still lacking. Setting a framework for irrigation system performance is a first step towards analyzing the functions of the irrigation system. This framework needs to be evolved in the context of various components of the system: the irrigation service, the agriculture service and the farmer.

The proposed minimum set of indicators for performance assessment of irrigation schemes are listed below:

Table 3-5: Proposed Performance Indicators

Indicator	Description
Output / unit land (Rs/acre)	Standardized gross value of output/ area irrigated
Output / unit irrigation supply (Rs/ft^3)	Standardized gross value of output/ irrigation delivered
Output/unit water consumed (Rs/ft^3)	Standardized gross value of output/ all water consumed
Return on investment	Standardized gross value of output/ cost of system
Financial self-sufficiency	Water charges / cost of O&M
Relative water supply	Total irrigation supply / irrigation demand
Water capacity	(Sub) system capacity / peak consumptive demand
Environmental indicators	- area lost to water logging and salinity - Groundwater level fluctuations, etc.

Source: Irrigation & Power Department

3.6 Performance Monitoring and Evaluation by PMIU

Program Monitoring and Implementation Unit (PMIU) established in Irrigation & Power Department for implementing efficient and optimal canal operations oriented towards equity and transparency and became operational in March 2006. The main mandate of PMIU is effective monitoring of canal operations of the entire Irrigation System of Punjab and suggesting appropriate measures of optimizing canal operations oriented towards equity and transparency through improved overall communication and flow of canal operational data intra-departmentally and also between the Department and water users with emphasis on addressing complaints regarding water thefts, tail shortages, violation of rotational program of canal operations and other maintenance and revenue related issues.

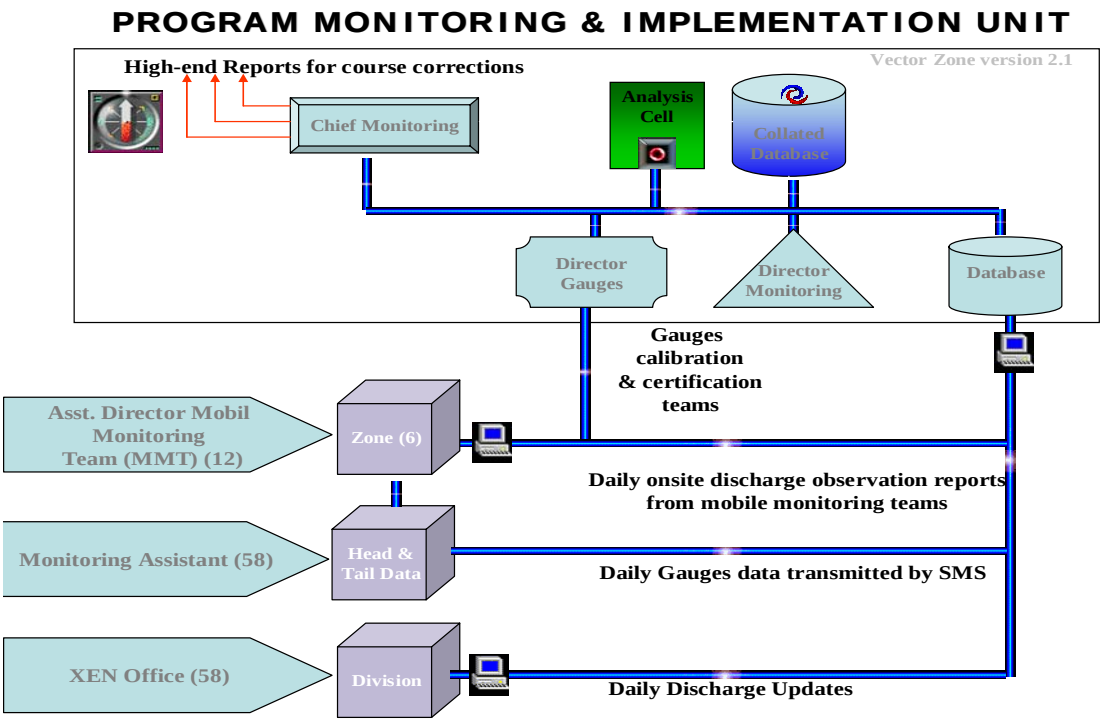

Figure 3-4: Program Monitoring and Implementation Unit

In order to meet the PMIU mandate, a team of experienced professionals was appointed on contract basis as well as by transfer from the existing strength of Irrigation and Power Department through open competition and they are well conversant with activities like discharge measurements, calibrations of gauges, development of Irrigation Management Information System (IMIS), and Decision Support Model (DSM), which provide support to high level management to monitor the key indicators of the system operations including the discharge of various canals and distributaries and decision-making regarding water distribution scheduling more transparently and oriented towards equity. The Unit is strengthened with 12 Mobile Teams (two for each Irrigation Zone) equipped with double cabin pickup and discharge measuring devices and 58 Gauge Readers (one for each Operational Canal Division) equipped with motorcycles. The Mobile Teams are frequently visiting in their respective zones to observe the actual discharge of channels / outlets and gauge readers are regularly observing the gauges especially of the tail of channels of Irrigation Divisions. This facilitates the Monitoring Unit to ascertain the correctness of the data collected in the Canal Divisions and exercising proper check for feeding of tails and ensuring equitable distribution of water in the channels / outlets according to the authorized shares and approved plans.

3.7 Performance Indicators Used by the Punjab Irrigation Department

The mandate of the Program Monitoring and Implementation Unit is to implement efficient and optimal canal operations oriented towards equity and transparency. In order to meet the PMIU mandate, following activities are being performed:

- Development of modern tools like Irrigation Management Information System (IMIS) including Database Management System (DBMS) and Decision Support System (DSS) in order to ensure transparency in getting reliable data available to all the stakeholders and also to facilitate the high level management in decision making;

- Monitoring of channels operation of entire irrigation network and issuance of daily channel operation report in order to ensure equitable distribution of canal water;
- Publication of daily discharge data of all the channels of Punjab on Irrigation Web Site to facilitate rapid monitoring of water distribution in the canal system especially in between Headworks and tail off-takes/outlets and to reduce grievances of lower riparian of canal system;
- Publication of water accounts for main canals regarding entitlements, deliveries and balance shares are posted on irrigation website in order to ensure transparency in water distribution and easy access to beneficiaries and also to enhance Confidence Building Measures (CBM) among the provinces;
- Regular surprise checking of about 10% gauges at head and tails of channels to ascertain correctness of data provided by field formations and proper checking for feeding of tails and equitable distribution of water. Accordingly, issuance of bi-weekly performance evaluation report (PER), which helps improving quality, efficiency and accountability of the system;
- Preparation and issuance of discharge tables on the basis of accurate discharge measurement and calibration of gauges to facilitate fair and equitable distribution of water among the stakeholders and also to ensure authorize supply at head and Inter-divisional and Inter-sub-divisional points;
- Monitoring of *Moghas* (outlets) of tertiary channels (watercourses) to ensure transparent distribution of water supply and to control water theft;
- Calculation of water entitlement of the entire irrigation network to ensure transparency in water distribution; and
- Development of Complaint Management System (CMS) to improve quality, efficiency and accountability with which irrigation services are delivered and also efficient attendance of complaints related to canal operations, shortage of water, water theft and warabandi, etc., lodged by farming community received on Toll Free Helpline (0800-11333), Chief Minister Complaint Cell, Chief Minister Open Katchery and Chief Secretary Petition Cell.

Table 3-6: Channel Operation Performance Indicators

Channel Operation Performance Indicators	Weight age on the basis of Field Division Data	Weight age on the basis of PMIU Checking
Dry Tails	-20	-10
Short tails	-16	-8
Excessive Tails	-10	-5
Authorized Tails	+30	+15
Water Losses/Unaccounted water	-25	---
%age of channels of which Data was not received from Field Division	-5	---
Difference of Head Gauges checked by PMIU staff with gauges conveyed by Field Division	---	-19
Difference of Tail Gauges checked by PMIU staff with gauges conveyed by Field Division	---	-19
TOTAL	**-46**	**-46**

4. PERFORMANCE & BUDGET/ EXPENDITURE TRENDS

4.1 Medium Term Budget Estimates (2009-12)

Budget allocations of I&P Department typically comprises of the following Grants:

Current Budget

Grant No.8 – for power sector O&M expenditures.

Grant No.9 – represents allocations to spending units of canal irrigation, small dams, flood control, drainage, land reclamation, planning and research etc.

Grant No.10 – for sector related O&M expenditures.

Development Budget

Grant No.36 & 37 – represents scheme-wise allocations for various development schemes i.e. irrigation, drainage, flood works, small dams, building sector, etc.

Summary of budget allocation/ forecasts under MTBF 2009-2012 (including comparison for 2006-07 to 2008-09) are given below:

Table 4-1: Summary of Budget Allocation / Forecast for MTBF 2009-10

(Rs. in Million)

Description	Budget Estimate 2006-07	Budget Estimate 2007-08	Budget Estimate 2008-09	Budget Estimate 2009-10	Budget Estimate 2010-11	Budget Estimate 2011-12
Current	6131	6793	7425	8597	9326	10079
Development	8650	11150	11302	10000	12500	14000
Total:	**14781**	**17943**	**18727**	**18597**	**21826**	**24079**

Source: Punjab Irrigation & Power Department 2009

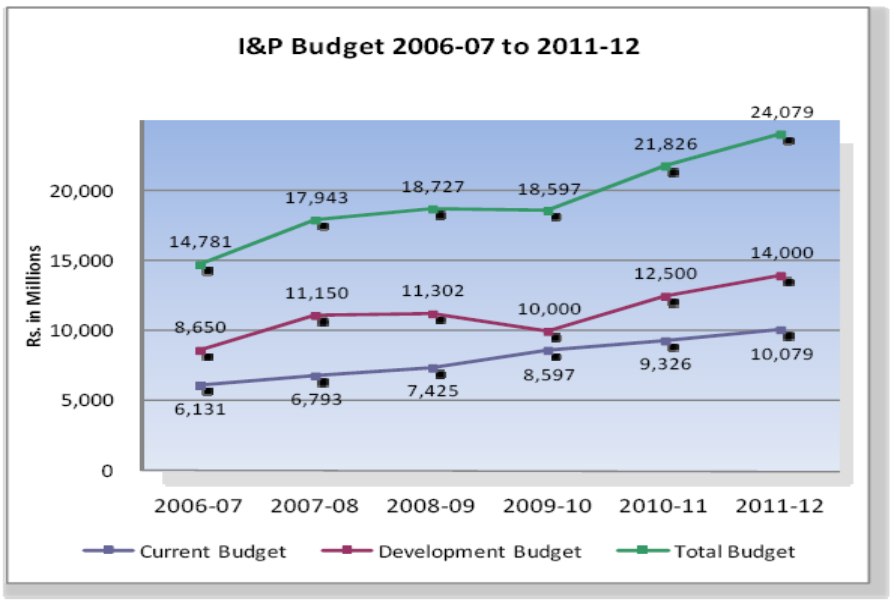

Figure 4-1: I&P Department Budget 2006-07 to 2011-12

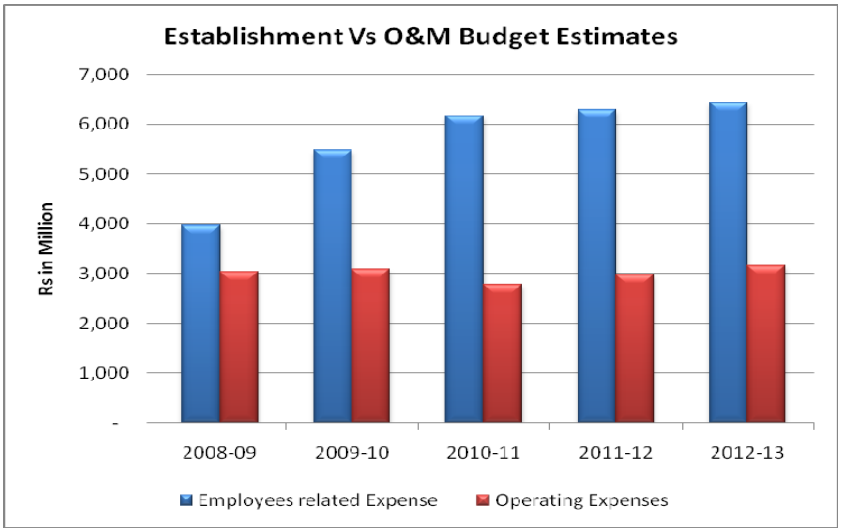

Figure 4-2: Establishment and O&M Budget Estimates

4.2 Working Group and Guiding Principles for MTBF

The following pre budget working group was constituted by the Chief Minister to recommend strategies for MTBF/ADP:

i.	Secretary C&W	Convener
ii.	Secretary I&P	Member
iii.	Secretary P&D	Member
iv.	Engineer Khurram Dastgir, MNA	Member
v.	Rana Muhammad Afzal Khan, MPA	Member
vi.	Rana Mehmood Ul Hassan, MNA	Member
vii.	Mr. Muhammad Waris Kalu, MPA	Member
viii.	Mr. Naveed Hamid, Professor, LSE	Member
ix.	Mr. Ali Cheema, Head of Economics, LUMS	Member
x.	Member Infrastructure Development (P&D)	Member

The above working group reviewed the existing system for ADP formulation and, after detailed deliberations, proposed a comprehensive framework for MTBF. The guiding principles for MTBF recommended by the above Committee are;

- Ongoing portfolio to be protected
- Rehabilitation of vulnerable barrages on priority
- Rehabilitation of irrigation systems where donor funding is available
- Continuation of institutional reforms
- Hydropower projects through private sector. Pilot project through ADB financing
- Lining and flood protection works according to the criteria
- Small Dams development on need basis
- Investment for drainage in critical areas

4.3 Formulation, Review and Approval of Budget Estimates

Budget estimates were formulated and key outputs determined for three years (2009-12) by spending units. These were then compiled, analyzed and consolidated at various stages. Budget demands were discussed in a series of meetings between spending units and the management of I&P Department to agree on a baseline. After submission of MTBF estimates to Finance Department (FD) and Planning & Development (P&D) Department, detailed discussions were held between I&P, FD and P&DD in Budget Ceiling and Management Committee meetings under joint protocols. Such engagements paved way for a constructive budget dialogue between these departments and finally culminated in approval of budgetary estimates by Steering Committee for FY 2009-12.

4.4 MTBF Allocations – Functional Classification

Functionally, major allocation of current and development over the medium terms is expected to be for Canal Irrigation followed by Irrigation Dams and Tube wells.

Table 4-2: MTBF Budget (Current & Development) 2009-10 to 2011-12

(Rs Million)

Function Description	2009-10			2010-11			2011-12		
	Cur	Dev	Tot	Cur	Dev	Tot	Cur	Dev	Tot
014110 Others	17	0	17	19	0	19	21	0	21
042201 Administration	379	0	379	418	0	418	460	0	460
042202 Irrigation Dams	93	5228	5321	102	6244	6346	111	7938	8049
042203 Canal Irrigation	5199	2174	7373	5630	4194	9824	6057	3666	9723
042204 Tube wells	1098	23	1121	1200	29	1229	1313	26	1339
042205 Equipment Machinery workshops	256	0	256	281	0	281	309	0	309
042206 Irrigation Research & Design	94	0	94	104	0	104	115	0	115
042250 Others	150	0	150	167	0	167	185	0	185
042301 Administration	59	0	59	64	0	64	70	0	70
042302 Water logging and Salinity Control	134	0	134	148	0	148	164	0	164
107105 Flood Control	1118	2462	3580	1193	1033	2226	1274	870	2144
043502 Electricity – hydel	0	113	113	0	1000	1000	0	1500	1500
Total	**8597**	**10000**	**18597**	**9326**	**12500**	**21826**	**10079**	**14000**	**24079**

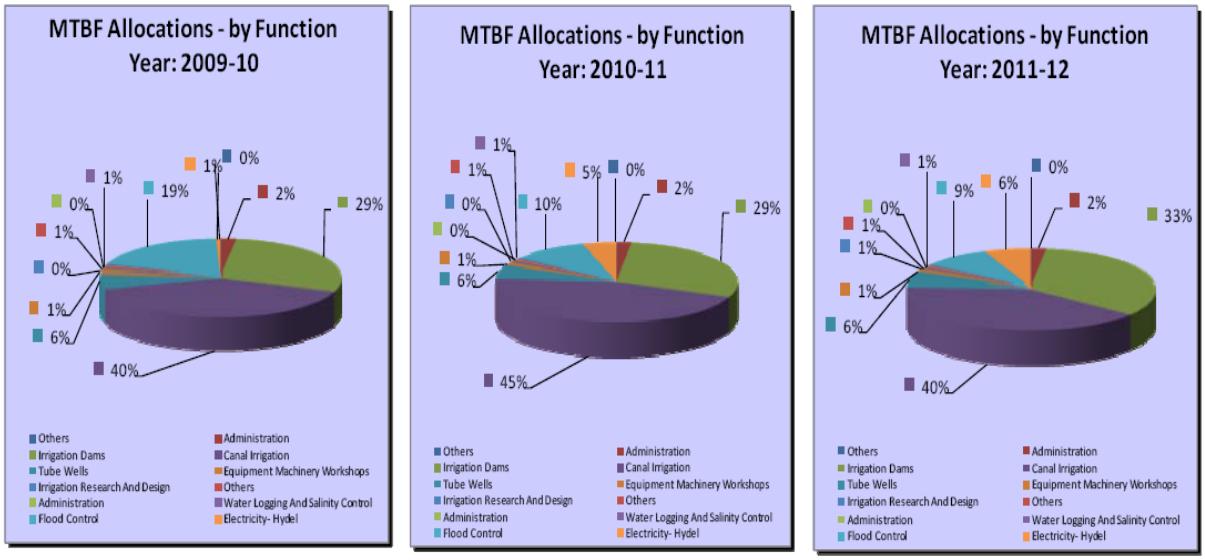

Figure 4-3: MTBF Allocations by Function Year 2009-10 to 2011-12

4.5 MTBF Allocations – Object Classification

In order to achieve the priorities set by the Department over the medium term the current budget (largely comprising of 'employee related expenses' and 'repairs and maintenance') is expected to show a consistent growth of around 8% (per annum in nominal terms) of the baselines set for 2009-10

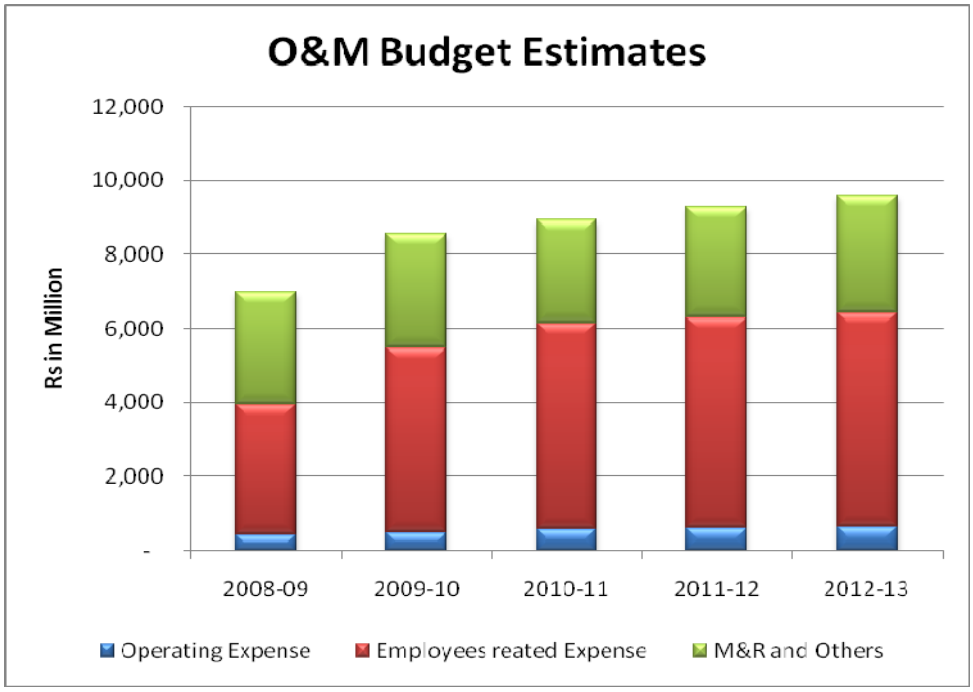

Figure 4-4: O&M Budget Estimates 2008-09 to 2012-13

Focus of development budget over the medium term (from FY 2010-11) would be widening with increased allocation towards 'civil works' and 'grants and subsidies'.

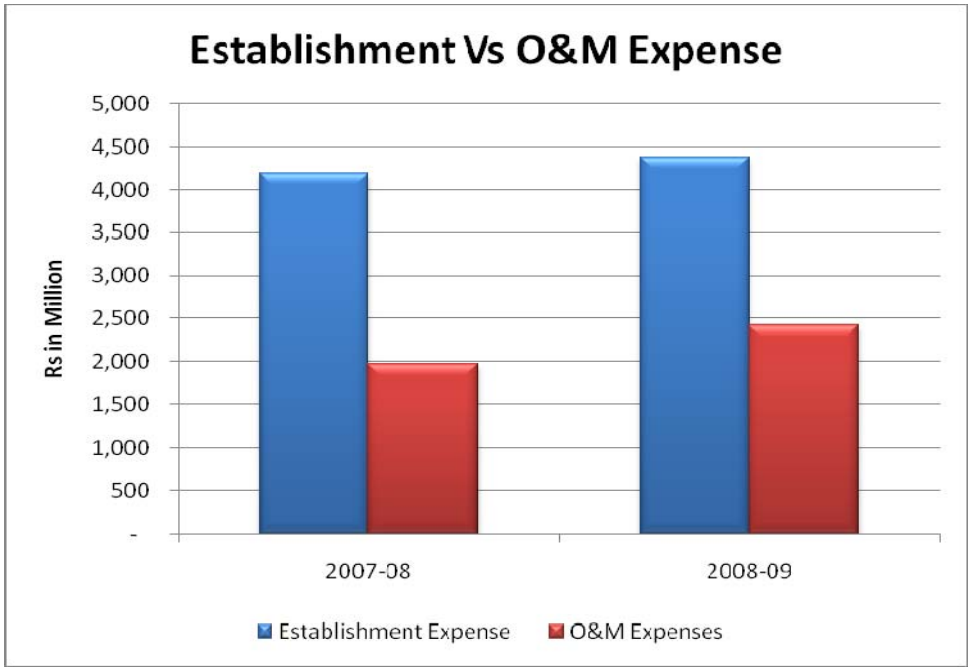

Figure 4-5: Establishment Vs O&M Expenses

The table below shows budget allocations for 2009-12 under major object head.

Table 4-3: Budget Allocations for 2009-12

Rs in million

Object Description	2009-10			2010-11			2011-12		
	Cur	Dev	Tot	Cur	Dev	Tot	Cur	Dev	Tot
Employee Related Expenses	4990	0	4990	5514	0	5514	6061	0	6061
Project Pre-Investment Analysis	9	197	206	9	341	350	9	305	314
Operating Expenses	497	0	497	552	0	552	598	0	598
Employee's Retirement Benefits	1	0	1	1	0	1	1	0	1
Grants, Subsidies & Write-off Loan	5	737	742	5	3903	3908	5	3457	3462
Transfer Payments	1	0	1	1	0	1	1	0	1
Physical Assets	6	0	6	1	0	1	1	0	1
Civil works	0	9066	9066	0	8256	8256	0	10238	10238
Repair & Maintenance	3088	0	3088	3243	0	3243	3403	0	3403
Total:	**8597**	**10000**	**18597**	**9326**	**12500**	**21826**	**10079**	**14000**	**24079**

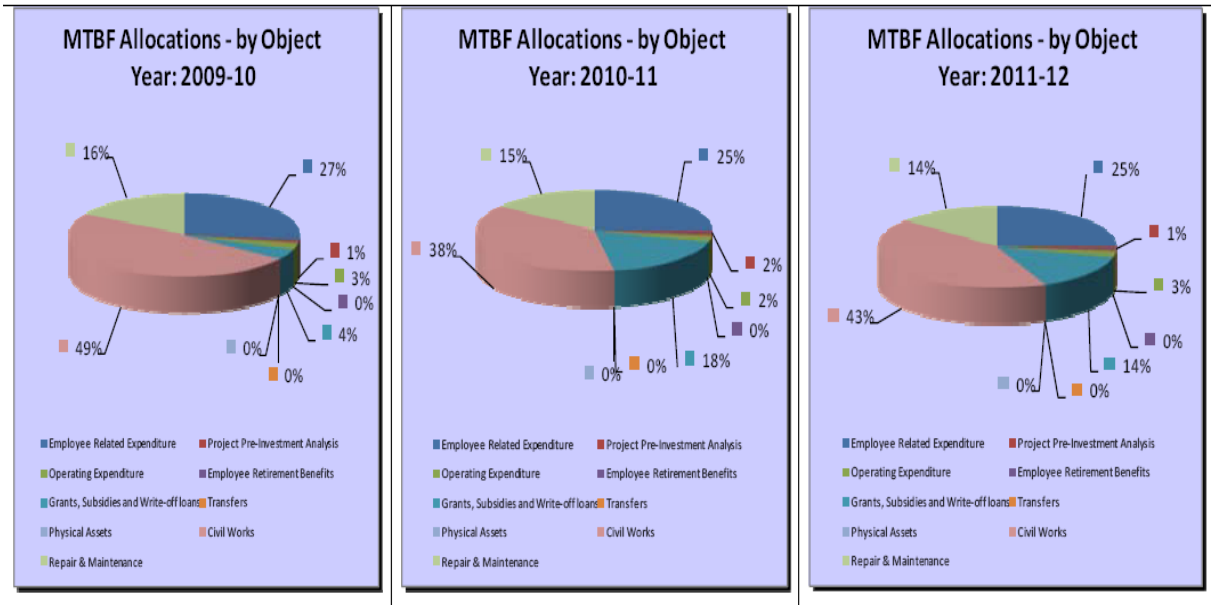

Figure 4-6: MTB Allocations – by Object Year 2009-10 to 2011-12

4.6 Key Strategies for Irrigation Sector MTDF (2009-12)

Key strategies underpinning the sector's development outlays under Province's MTDF (2009-10 to 2011-12) are to:

- Implement structural measures for optimal utilization of surface water resources.
- Increase public investments for modernization of irrigation infrastructure.
- Develop and practice holistic approaches to the use of surface and groundwater and for enhancing the agricultural productivity.
- Implement measures to reverse environmental degradation and groundwater mining.
- Promote broad based institutional reforms already initiated through FOs in LCC area aiming at transparency, efficiency and autonomy to sustain the resource base and in restructure.
- Augment renewable energy resource base through installation of low-head hydel stations on canal falls.
- Extend and improve drainage, flood protection, hill torrent management and command area development interventions in riverain and rain-fed (Barani) areas.

4.7 Salient Features of Sector's MTDF (2009-12)

Irrigation sector's total outlay for the year 2009-10 is planned as Rs 10.0 billion which constitutes about 10% of the core ADP (2009-10) budget under the MTDF 2009-12. Project outlays for the sector in years 2010-11 and 2011-12 are Rs 12.500 billion and Rs 14.000 billion respectively. MTDF 2009-12 and ADP allocations, releases and expenditure (2005-2009) is attached at **Appendix-2**. Out of the total 78 schemes included in MTDF 2009-10, 40 schemes comprising 32 ongoing and 8 new schemes have been targeted for completion by allocating 89.7% of outlay to the ongoing and 10.3% to new schemes.

The age wise break up of ADP schemes 2009-10 is as per following;

New Schemes	28
0 – 3 Years	34
3 – 5 Years	11
Over 5 Years	5

4.7.1 Limitation of Supplementary Grants

As per agreed policy action under Sub Program 2 (SP 2) of Punjab Government Efficiency Improvement Program (PGEIP) ceiling on provision of additional funds through net supplementary grants (current/development) (gross supplementary grants less savings within the same grants) during financial year 2009-10 are to be observed 5% for current expenditures and 10% for development expenditures.

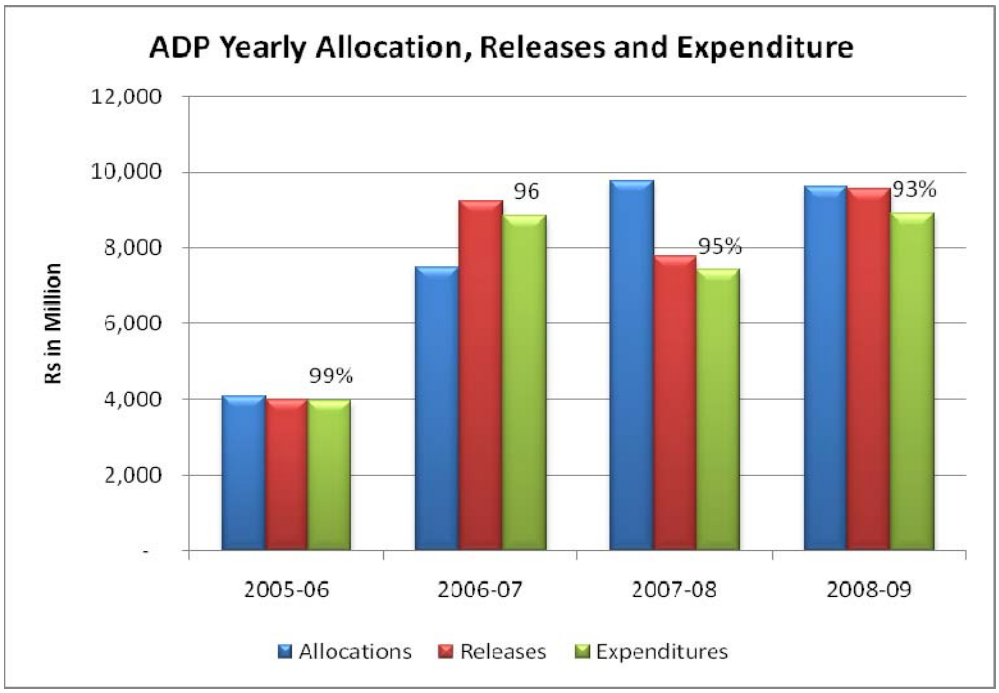

Figure 4-7: ADP Yearly Allocation, Releases and Expenditure

4.7.2 Appointment of Construction Supervision Consultants for ADP

Irrigation & Power Department is executing various important development projects through the portfolio of Annual Development Program. These projects geographically cover all the Punjab and include works of varied nature such as earthwork, lining of channels, side/slope protection, renovation/rehabilitation, re-construction and/or new construction of hydraulic structure, small dams, drains, river erosion/projection or diversion, electrical/mechanical works of gates, machinery and equipment etc. These projects involve multi contract construction strategy, where large number of contractors is to be engaged for undertaking works of varied quantum. There is significant financial

outlay involved in the implementation of the project every year. Considering the sizeable volume, geographic spread and varied nature of ADP projects within planned time, cost and quality organized efforts are required at the provincial level.

The induction of consultants will help to review the design of various projects components and other facilities. It will also take up review and the check of survey work and quantum of various works involved in the development projects. Consultants will firm up the cost of work proposal based on market rate system. It is anticipated that project implementation will improve with better quality assurance and control of the ADP works/schemes.

4.7.3 Scope and Responsibilities of Consultancy Services

The principal purpose of acquiring the consultancy services is to ensure that the projects are constructed with a high standard of workmanship using good quality materials within the scheduled/contract times and in conformity with the approved drawings and specifications, acceptable environmental standards and in accordance with the client's requirements and scope of work but within approved cost of the work(s) strictly adhering to rules and instructions of the Government of the Punjab for execution of works.

The consultants shall be required to provide the consultancy services under a consultancy contract administered by Chief Engineer P&R Zone of Irrigation & Power Department by providing technical assistance in the form of engineer's representative (ER). The consultants would be required to review the design for the construction / rehabilitation of canal and drainage systems, small dams, rivers erosion control, training and diversion works including all types of structures and buildings as per latest technical standards and specifications for which data & surveys will be provided by respective executing division but detailed checking data for ensuring its correctness will be consultants' responsibility. They will also be responsible for resident supervision of works exercising best practices for quality assurance and quality control on materials and execution of works as per approved design drawings and specifications. In discharge of these duties the consultants will exercise care and diligence, accuracy and completeness, economy and professional skill.

4.7.4 Capacity Development of Budget and Drawing & Disbursing Officers

Issuance of MTBF Budget Call Circular was followed by a series of workshops organized by core team for budget and accounts staff of spending units of I&P Department in November and December 2008. Training workshops were held in Lahore, Multan and Faisalabad. The MTBF consultant team along with core team provided essential technical support and trained around 400 budget and accounts staff / DDOs of the spending units of I&P Department in 7 days of workshops. The capacity building initiative is continuing.

4.7.5 Hand-holding Support to Spending Units

Orientation given to budget and accounts staff / DDOs in MTBF training workshops was further strengthened by providing extensive hand-holding support at respective spending units spread all across the Province. In addition to the earlier MTBF training workshops a number of mini-workshops were also held besides one-on-one sessions with the budget and accounts staff and DDOs.

4.8 ADP Throw Forwards

- Throw forward beyond June 2010 is Rs. 73410 million
- Throw forward beyond June 2011 is Rs. 60910 million
- Throw forward beyond June 2012 is Rs. 46916 million

ADP throw forward beyond June 2010 for new schemes is Rs. 42,060 million and for on-going schemes is Rs. 31,356 million. Similarly, ADP throw forward beyond June 2010 for foreign aided schemes is Rs. 38,197 million and for normal schemes is Rs. 35,213 million.

Sub sector wise throw forward beyond June 2012 for on-going and new schemes is given below:

Table 4-4: Sub Sector Throw Forward beyond June 2012

(Rs. Million)

Sr.#	Sub Sector	Throw Forward beyond June 2012*		
		On-going	New	Total
1	Survey, Investigation & Research	9	0	9
2	Irrigation	0	22287	22287
3	Drainage	0	0	0
4	Flood Works	0	1605	1605
5	Small Dams	0	0	0
6	Buildings	0	0	0
7	Miscellaneous	203	0	203
8	Foreign Aided Projects	15127	7685	22812
	Total	**15339**	**31577**	**46916**

Note:- * In case new schemes are not added.

4.9 PSDP Allocations, Expenditures and Releases

Government of the Punjab is implementing various projects funded by the Federal Government under Public Sector Development Program. The on-going projects include:

- Lining of Irrigation Channels in Punjab
- Irrigation System Rehabilitation in Punjab
- Rehabilitation of Sidhnai Mailsi Link Canal, Punjab
- Extending Bhakhar Flood Bund and
- Punjab Barrages Rehabilitation Modernization Project Phase-I

It has been indicated from the data at **Appendix-3** that flow of funds from the Federal Government against all the above projects is slow and releases are far short of the Federal PSDP allocations. It is indicated that as against allocation of Rs. 4298 million for the year 2009-10 only Rs. 429.4 Million (10%) have been released so far. This is hampering implementation of the projects and as a result thereof, completion is delayed.

In addition to the above, the following two new projects are included in PSDP 2009-10:

- Construction of small dams in Pothohar areas in Punjab
- Construction of new Khanki Barrage

Federal Government needs to expedite release of funds so that the projects/schemes may be accomplished on time. PSDP allocations, expenditures and releases are given below:

Table 4-5: Releases of Funds for Projects included in PSDP 2009-10

(Million Rs.)

Sr #	Name of Projects	Date of Start	Planned date of completion	Estimated Cost	Funds provided by Federal Government on 30-06-2009	%age Funds Released	Allocation 2009-10	Releases 2009-10
1.	Lining of Irrigation Channels in Punjab	2005-06	2009-10	30,996	2,575	8	1000	200
2.	Irrigation System Rehabilitation Project	2003-04	2007-08	19,519	5,581	29	1000	200
3.	Rehabilitation of Sidhnai Mailsi Link Canal	2006-07	2008-09	373	205	55	50	-
4.	Extending Bhakhar Flood Protection Bund from RD 42+72 Basti Mian Khan of Basti Bukhara in District Bhukkhar	2007-08	2008-09	496	250	50	98	29.4
5	Punjab Barrages Rehabilitation Modernization	2003-04	2008-09	1647	1025	62	150	-
6	Construction of 5 Small / Medium Dams in Punjab (Kot Fateh, Mujahid, Lawa, Mora Shera and Jamalwal	2009-10	2014-15	2,367	-	-	500	-
7	Khanki Barrage	2009-10	2011-12	23442	-	-	11500	-

4.10 I&P Department Maintenance and Repair (M&R) Works

Maintenance and repair (M&R) works for any asset may involve one of the following three activities:

- **Preventive Maintenance:** the works required to avoid unnecessary deterioration of an asset other than normal wear and tear such as, painting of gates in an irrigation and drainage system, oiling of moving parts in gates and gearing, cleaning and painting of walls of the buildings, repairing of general wear and tear in the earthen embankment of a canal or a drain or a flood embankment etc.
- **Repair works:** the works involving the removal of defects that may occur due to improper use or by accident or otherwise, which if not repaired may endanger safe use of the asset and can become cause of its complete destruction. Includes making up of worn out earthen embankment to the designed dimensions, and the de-silting of the channels as well as the repairing embayment with killa bushing etc.
- **Replacement of parts of and/or complete facility:** these types of works may involve replacement of a spare part that might have worn out, replacement / reconstruction of a facility that might have spent its useful life or damaged to an extent that it cannot be beneficially used.



Streamlining banks of a main canal



Dowel repair work on a main canal





Compaction of earth work on a main canal

Figure 4-8: Pictorial view of various O&M Works

In order to carry out durable M&R works of required quality, the following activities need to be carried out:

- Periodic inspections to determine the M&R needs of major structures, such as barrage, large hydraulic structures, main canals and large flood control facilities;
- Preparation of annual work plans for M&R;
- Procurement of M&R works envisaged to be carried out in a fiscal year;
- Supervision and monitoring of implementation of progress of individual M&R works and in turn the annual work plans; and
- Reporting and documentation of M&R works accomplished, to be used as bench mark / starting point for preparing next annual work plan.

4.11 Present Practice

The irrigation, drainage and flood control facilities of Punjab Irrigation and Power Department are managed by nine Zones: (i) Bahawalpur, (ii) DG Khan, (iii) Development, (iv) Drainage & Flood, (v) Faisalabad, (vi) Lahore, (vii) Multan, (viii) Sargodha, and (ix) Research, each headed by a Chief Engineer. In addition there is Directorate of Land Reclamation, which manages and supervises

tubewell operations. Each Zone except Research Zone is spilt into three or more circles (generally supervising a canal command) headed a Superintending Engineer (SE), while the circles are further divided into irrigation or drainage divisions that are headed by Executive Engineers (XENs) who are responsible for carrying out the M&R activities with the assistance of Sub-Divisional Officers (SDOs) and Sub-Engineers (SEN). The Irrigation Research Zone contains only one division that carries out M&R of assets of this Zone.

4.11.1 Inspections of Establishing M&R Needs

Presently, there is no specific and / or regular system of inspections for establishing M&R needs. Based on the knowledge acquired during the course of operation of the irrigation, drainage and flood control facilities for which the concerned XEN is responsible using assistance of SDOs and Sub-Engineers, the XEN prepares annual work plans. In actual fact these work plans are prepared on the recommendation of the Sub-Engineers or some times SDOs have limited knowledge of the section of system / sub-system in their control. These recommendations for annual plans are often curtailed or completely ignored to suit the limited available funds. Since documentation of inspections are not prepared on regular basis, the preparation of work plans for M&R is not a continuous or regular process, which by transfer of a Sub-Engineer and SDOs may loose track completely.

Previously the inspections by Senior Engineers (CEs or SEs) were regular and periodic features but now such inspections are occasionally made by the senior officers and those too are not specifically for establishing / advising the M&R needs. The inspection by independent third party has neither been in vogue in the past nor as it regularly practiced presently. Only once it is understood to have been carried out by retaining the services of a consulting firm to establish need of a few large hydraulic structures in the recent past.

4.11.2 Yardsticks

A realistic budget and proper annual work plan for M&R can only be prepared after carrying out the condition surveys of the infrastructure to determine their M&R needs. But this exercise in not costly but also requires substantial time to repeat every year. As an alternative, based on experience of operating the system and estimating the needed quantities and unit costs to repair the deterioration that occurs during a year, M&R yardsticks were prepared in order to expeditiously prepare the annual M&R budget and a list of M&R works.

The yardsticks were first introduced in 1937. These were updated in 1982, 1992, 2004 and 2008. In the updating process, whereas the unit quantities in the yardsticks were generally considered adequate for proper O&M but the higher unit rates were used to revise the yardsticks in order to cope with inflation. Due to fiscal difficulties, the allocations by the provincial government are generally made on precedence of the previous years without regard to ground conditions or requirement of increased costs due to inflation. The actual releases depend upon the availability of funds and seldom match the realistic requirements. As a result, the annual work plans are not based even on the yardsticks. This has caused accumulation of maintenance works over the years. Also, the implementation of M&R is not monitored with the unit works assumed to be required annually in the yardsticks.

Since October 2004, the Government of Punjab has adopted Market Rate System (MRS) for preparing project cost estimates, which are updated on monthly basis and are posted on the web. The present O&M yardsticks are those approved in August 2008.

4.11.3 Preparation of Annual Work Plans

As indicated above, the annual work plans for M&R are prepared by the concerned XEN using the information provided by Sub-Engineer / SDO. The XEN forwards the annual work plan of his Division to the concerned Superintending Engineer for recommending it to the respective CE of the Zone. The CE approves the annual work plans prioritizing the proposed M&R works keeping in view

the available budget. This process is carried out in the beginning of a fiscal year. Generally, the work plans approved in the beginning of the fiscal year are revised for the following common reasons:

- Directives during the inspection of senior officers;
- Complaints by the water users;
- Emergent repairs; and
- Curtailment of budgets.

The preparation of work plans is a revised form of the previously in vogue practice whereby Superintending Engineer used to approve the list of works to be undertaken in a division during the fiscal year. The work plans still basically are lists of works and seldom take into account: (i) time required to establish maintenance needs, design maintenance works and prepare tender documents; (ii) time required to obtain competitive bids; (iii) seasonal constraints such as rainy season; (iv) arrangements of supervision needed, etc. The result is that the work is not only inadequately supervised due to large number of works going on simultaneously but the works are delayed to an extent that those are generally completed in haste towards the end of a fiscal year. This makes the procured work questionable vis-à-vis quality and quantity.

Since the annual work plans are neither based on the unit works assumed in the approved yardsticks nor any regular procedure of inspections the M&R works carried out are only adhoc in nature and the system continues to suffer form accumulated deterioration.

4.11.4 Third Party Engineering Audit of O&M Works

I&P Department have appointed third party consultants for carrying out the performance evaluation and engineering audit of M&R works. Zone wise budgets allocations, releases and utilization are attached at **Appendix-4**. The reports prepared by the Consultants in 2007-08 and 2008-09 are comprehensive and give the information, division-wise, circle-wise and zone-wise including but not limited to the following:

- Budget allocations;
- Cost of work plans prepared;
- Number of contracts planned, along with the amounts;
- Number of contracts awarded, along with the amounts;
- Number of contracts completed, along with the amounts;
- Number of contracts that remained incomplete, along with their amounts;
- Budget utilized; and
- Quality of work procured.

The recommendations of M&R consultants are attached at **Appendix-5**, where issues have been highlighted as a result of performance evaluation and engineering audit of M&R works. I&P Department is required to address the highlighted issues by the consultants to achieve the operational and financial efficiencies for the current budget side.

4.11.5 Budget Allocation & Utilization -Contracts Planned, Awarded & Completed (2007-08)

Division-wise, Circle-wise and Zone-wise information regarding budget allocation and utilization, number of contracts of M&R works awarded, completed and left incomplete during the financial year 2007-08 as provided by the Department is presented in the following figure, which indicates the overall position of all the 6 Zones of Irrigation & Power Department.

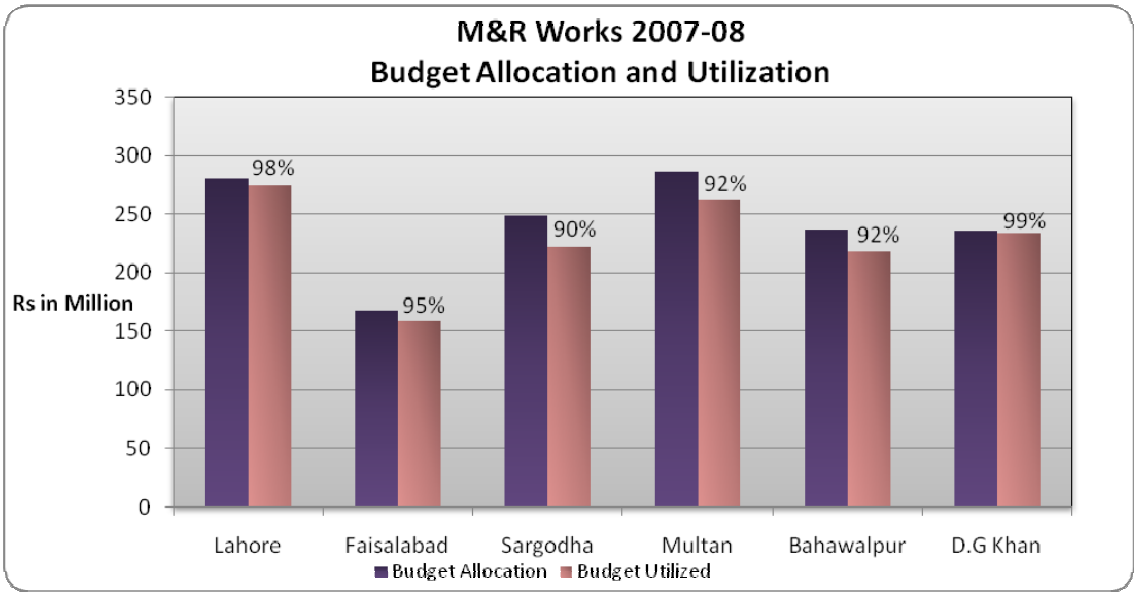

Figure 4-9: Zone-wise M&R Budget Allocations and Utilization 2007-08

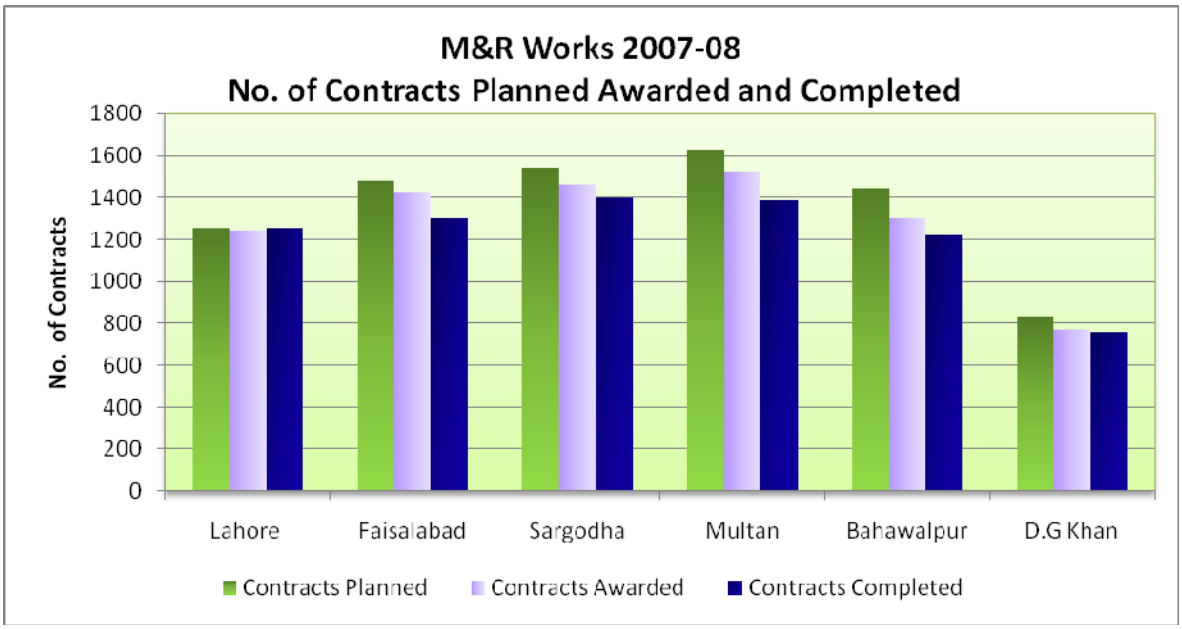

Figure 4-10: Zone-wise No. of Contract for M&R Works Planned and Completed 2007-08

4.11.6 Budget Allocation & Utilization - Contracts Planned, Awarded & Completed (2008-09)

Division-wise, Circle-wise and Zonal-wise information regarding budget allocation and utilization, number of contracts of M&R works awarded, completed and left incomplete during the financial year 2008-09 as provided by the Department is presented in respective Zones. The overall position of all the 6 Zones of Irrigation & Power Department is presented as under:

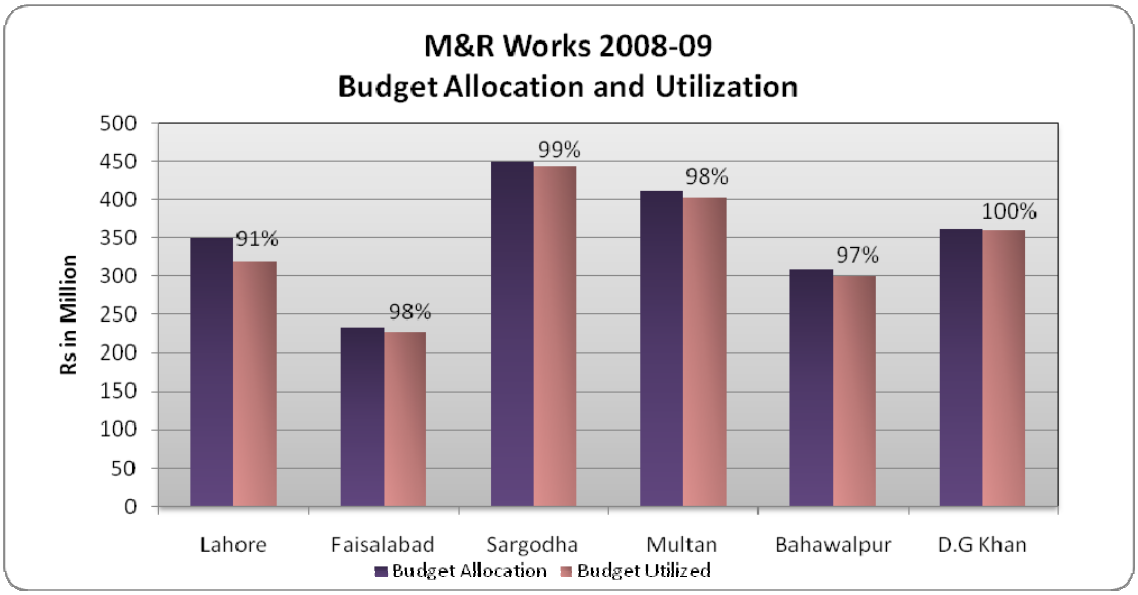

Figure 4-11: Zone-wise M&R Works (Budget Allocations and Utilization 2008-09)

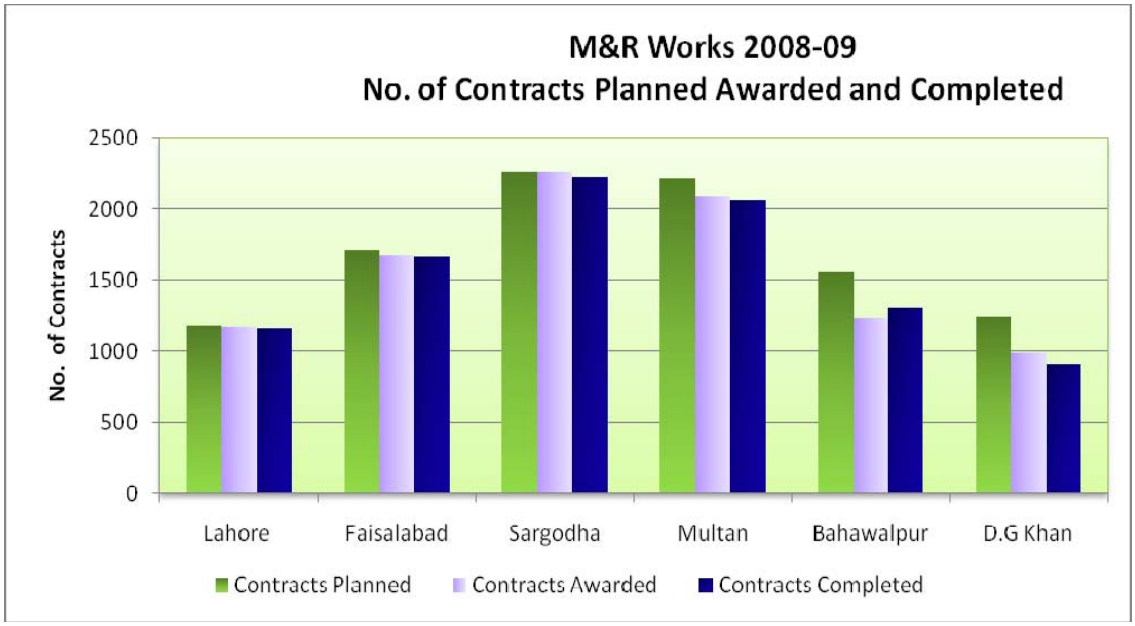

Figure 4-12: Zone-wise No. of Contract for M&R Works Planned and Completed 2008-09

4.11.7 Impact of Institutional Reforms on Irrigation Department Objectives and Functions

Institutional Reforms in the Irrigation Sector were initiated in 1997 with the promulgation of PIDA Act. The reforms objectives focus on:

- Autonomy and Decentralization
- Farmers Participation and Empowerment
- Efficiency and Sustainability

As part of institutional reforms, Five AWBs have been notified as below:

1. Lower Chenab Canal Circles (East)
2. Lower Chenab Canal Circles (West),
3. Lower Bari Doab Canal,
4. DG Khan Canal Circle
5. Bahawalnagar Canal Circle

LCC (E) AWB has been made functional since 2007. Irrigation Management Transfer was made to 84 FOs in LCC (E) in 2005 and to 100 FOs in LCC (W) - (Hafizabad, Sheikhupura, Faisalabad, T.T Singh and Jhang Districts) and CRBC in 2007. FOs in LCC (E) have completed their tenure.

The performance evaluation of 84 FOs in LCC (E) AWB indicates mixed results:

- Good Performance 25% FOs
- Average Performance 50 % FOs
- Poor Performance 20-25% FOs

The strengths of the new system include farmers' awareness and ownership, speedy dispute resolution, efforts for equitable water distribution and development of local capacity for irrigation management. The weaknesses include declining abiana collection, weakness in maintenance of accounts and record keeping, increasing water theft and elite capture in some cases.

As a result of implementation of institutional reforms, the objectives and functions of Irrigation Department need to be redefined.

4.11.8 A Case Study of Taunsa Barrage Emergency Rehabilitation and Up-gradation Project

A brief case study of Taunsa barrage emergency rehabilitation and up-gradation project is attached as **Appendix-6**. Barrages rehabilitation and up-gradation is the priority need of deteriorated irrigation system as part of mega project. During implementation of the project, it is learnt that the following aspects of the projects need to be carefully planned before execution of project:

- Preparation of project design
- Project Management System / Monitoring Mechanism
- Contract specifications
- Procurement planning
- Safeguards (environment, socio-economic / political and resettlement)
- Familiarization with donors policy guidelines
- Project implementation scheduling
- Project implementation reporting



Figure 4-13: Taunsa Barrage Emergency Rehabilitation and Up-gradation Project Activities

4.11.9 Development of Key Performance Indicators

Government of the Punjab has been trying to improve the well being of the people through better governance and service delivery. Public Sector Delivery efforts suffer from a multiplicity of factors including but not limited to design flaws, resource gaps and management inefficiency. While the removal of design flaws is a relatively long term reform process (already underway in the form of sectoral reforms programs) and resource gaps are contingent upon the revenue collection, management inefficiencies can be removed through better governance at the provincial levels.

Management inefficiency occurs either due to lack of capacity or due to slackness in working. This area requires a focused attention for making the greatest impact on service delivery. This also requires a robust monitoring system that allows the performance of individuals to be measured systematically and then evaluated. The development of key performance indicators (KPIs) which are able to capture core business processes of the department and are easily measurable can provide a good monitoring and evaluation framework towards public sector service delivery.

A performance indicators or key performance indicators is a measure of performance. Such measures are commonly used to help an organization define and evaluated how successful it is, typically in terms of making progress towards its long term organizational goals. In order to be useful, KPI need to be quantifiable and measurable. The KPI's are to provide a fair comparison of an organization past and present performance – a process that will allow the identification of potential problems in operations.

A KPI can be either macro (provide a broad picture) or micro (provide a detailed measure). The advantage to capturing macro data is that it is easily implementable, but the disadvantage is that it provides very little information on where inefficiency is occurring. Micro data on the other hand narrow down to the specification causes of low performance. Recently an effort has made by the I&P Department for development of individual key performance indicators by encompassing the activities/job tasks/functions. However, the measurement methodology and monitoring mechanisms/framework are to be further established. Performance indicators developed by I&P Department have been attached at **Appendix-7**.

4.12 Linkage of O&M Budget with Canal Operations Performance

The Water availability during Kharif 2006-09 and the corresponding O&M Budget allocations are compared to the canal operations performance in the following figures. It would be noted that as a result of increased O&M allocations, better planning, third party validation, and improved monitoring by Program Monitoring and Implementation Unit, the channel operation is exhibiting substantial improvements.

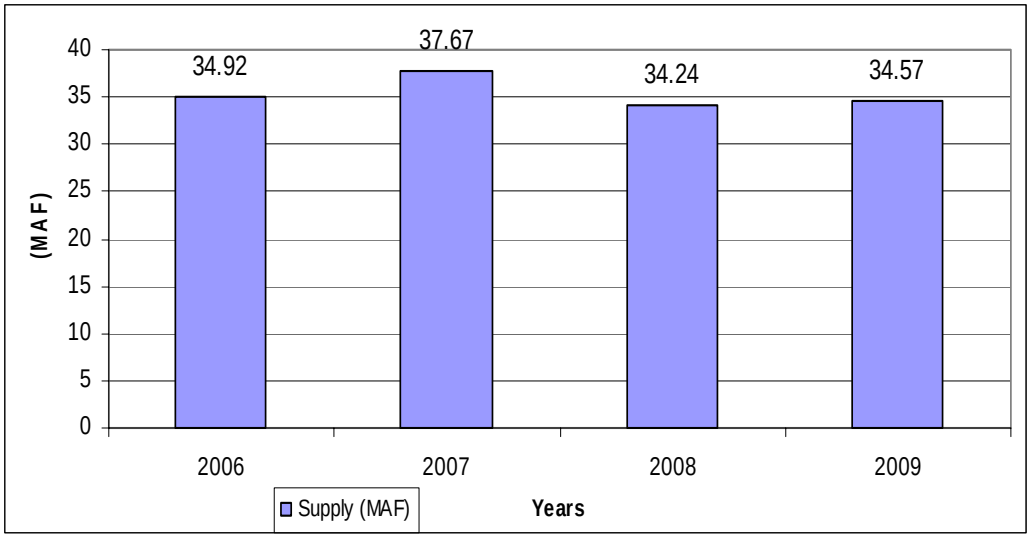

Figure 4-14: Water Supply during Kharif Seasons

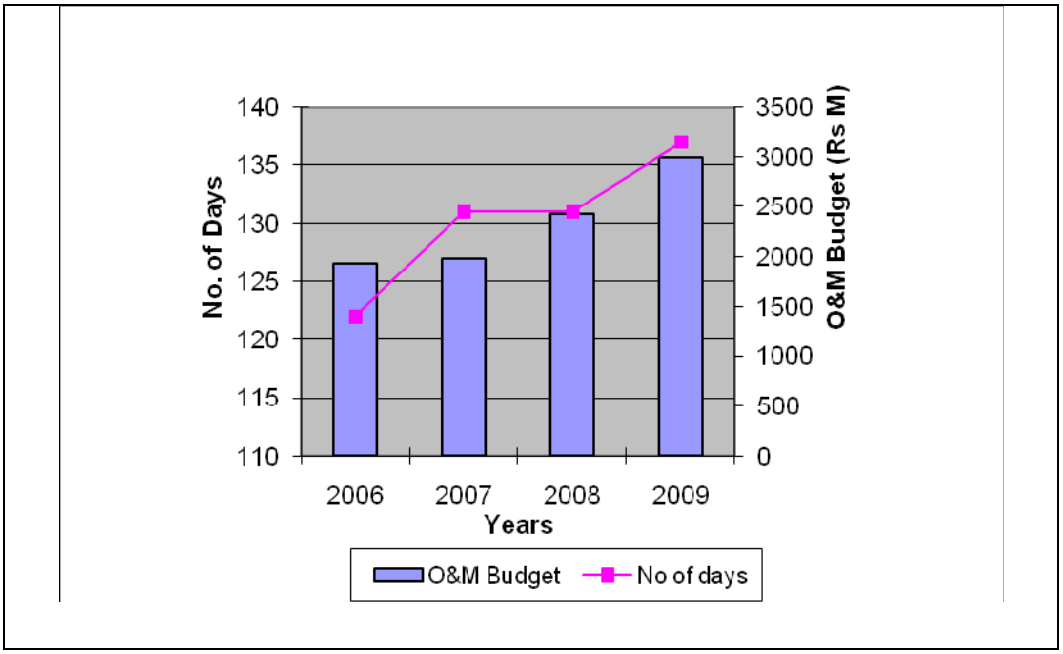

Figure 4-15: O&M budget allocations Vs Average No. of Days Channels were Running from Head

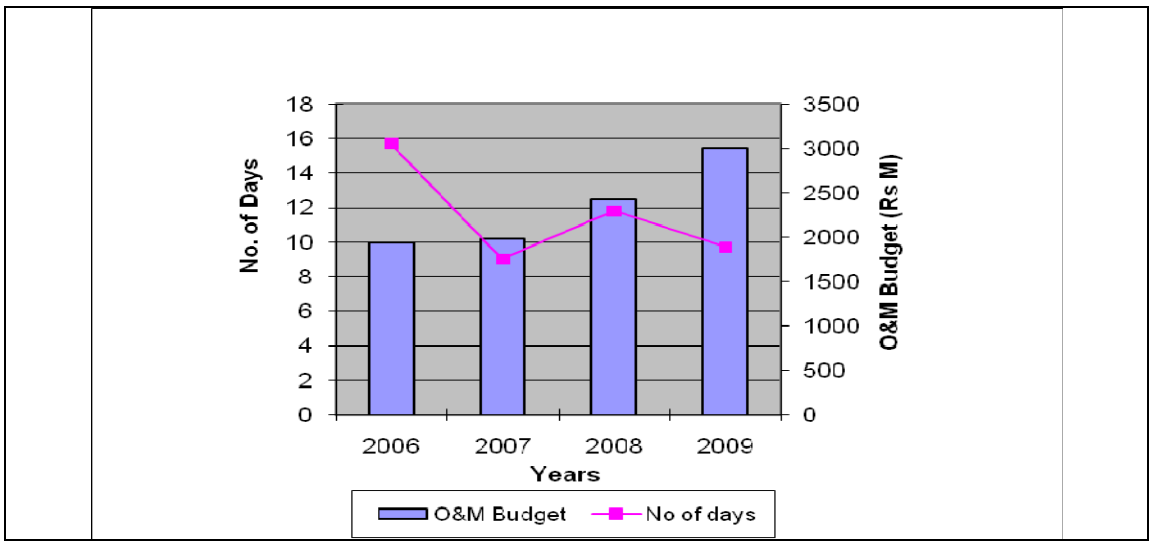

Figure 4-16: O&M budget allocations Vs average No. of days when there was no supply at tails

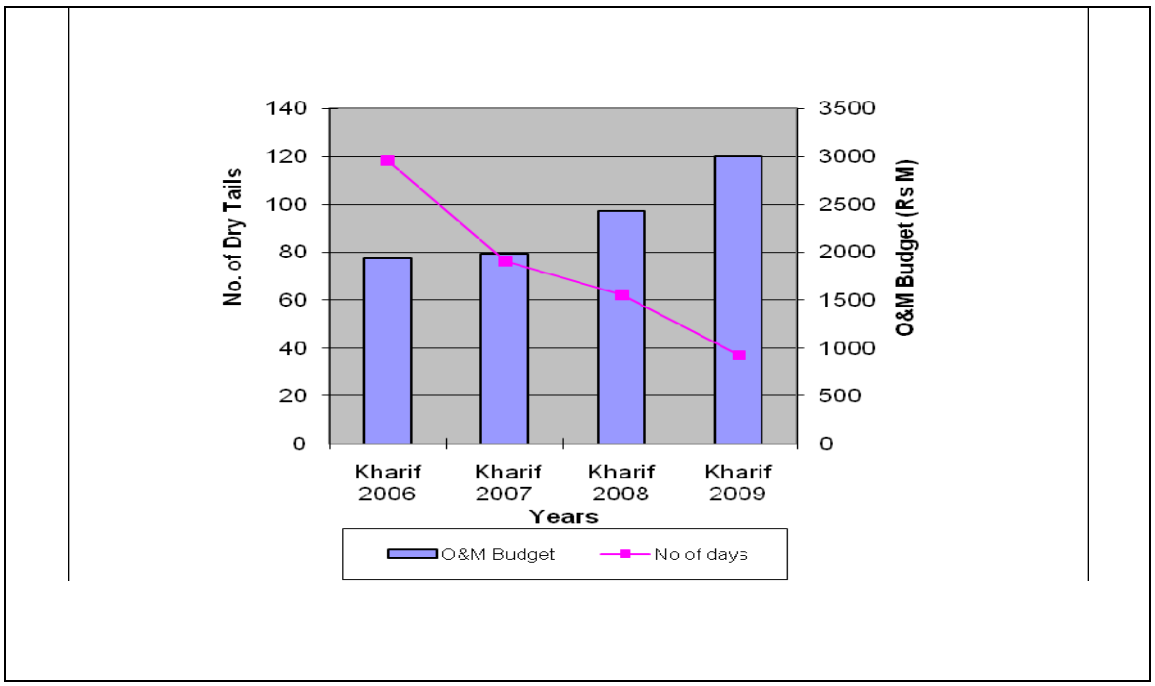

Figure 4-17: O&M budget allocations and status of dry tails

5. RECOMMENDATIONS

5.1 Reducing Deferred Maintenance Cost

As part of Irrigation Sector Reforms Program during FY 2005-07, the budgetary reforms were introduced in Irrigation Department. Major activities such as preparation of Assets Management Plan, Zone specific yardsticks, O&M cost sharing principles and increase in abiana (water rate) collection under the reforms program were carried out. Before the commencement of irrigation sector reforms, despite the fact the canal system was under great stress due to increased demand, the yearly funds allocated during the past two decades for M&R of the system were highly inadequate to meet M&R needs, besides deterioration and ageing of structures like canal falls, bridges and head regulators. The budgetary provisions for FY 2008-09 were made on the enhanced budget estimates. The aforesaid increase in the maintenance budget supported by increased transparency and monitoring of M&R budget spending will have significant impact towards avoiding the accumulation of deferred maintenance in future, which had been happening in the past due to paucity of funds and consequently necessitating cyclic rehabilitation programs.

5.2 Key Priorities in Developing Current Budgets

Key priorities in developing current budgets over the medium term (2009-12) are:

- Maintenance and repair of irrigation network
- Operational safety of irrigation network
- Improved equity through desilting operations
- Upkeep of flood protection works
- Maintenance of drainage facilities for timely evacuation of drainable surplus

In order to carry out M&R works of required quality in an effective and efficient manner, the preparation of annual work plans, periodic inspections to determine the M&R needs, procurement of M&R needs, procurement of M&R works / resources to be carried out in a fiscal year, and monitoring of implementation of M&R works are very important. I&P Department had appointed the Third Party Consultants for performance evaluation / engineering audit of M&R works during FY 2007-08 and FY 2008-09. The experience of Third Party Engineering Audit of O&M works has been quite encouraging in improving the documentation, estimation and execution standards of the works. The general issues requiring attention of Irrigation Department have been highlighted by Third Party Consultants. The good feedback identifies the gaps and required improvements for implementation of annual work plans. I&P Department is accordingly focusing issues such as better planning to avoid significant budget utilization during last months of the financial year.

It is recommended that Third Party Engineering Audit by Consultants may be continued and strengthened in order to bring quality improvements in preparation, planning and execution of M&R works, which will be helpful in achieving the departmental objectives.

5.3 Key Priorities in Developing ADP Portfolio

Similarly, key priorities in the developing budgetary estimates of development budgets over the mid term period (2009-12) are:

- Phased rehabilitation and up-gradation of canal structures
- Institutional reforms and initiatives for integrated water resources management
- Construction and up-gradation of small dams

Review of ADP portfolio indicates break-up of huge throw-forwards beyond June 2010, as summarized below.

Table 5-1: ADP Portfolio of throw-forwards 2010 to 2012

Sr. No.	Year	Throw Forward * (Rs. In Million)
1	June 2010	73410
2	June 2011	60910
3	June 2012	46,910

* In case, no new schemes are added.

It is recommended that Department should concentrate on taking policy actions to keep these throw forwards to a manageable level.

These actions may require:

i) Careful planning: only very urgent new schemes are included and their completion may be scheduled in two to three years.

ii) Reducing the number of ageing schemes which have been lingering on for a number of years.

iii) Better planning of Foreign Aided / Mega Projects to avoid start-up delays by advance planning implementation support and adequate monitoring.

iv) The construction supervision consultants for Annual Development Program have recently been appointed by I&P Department. Considering the sizeable volume, geographic spread and varied nature of ADP projects, the Consultants would help in implementing the development portfolio within planned time, cost and quality of works. The scope of services by consultants would not only be restricted to review of design and cost estimates but also to ensure the project implementation by using good quality material within the scheduled / contract times in conformity with the approved drawings and specifications.

v) The ADP Consultants have already mobilized and are in the process of putting in place a framework for checking of works. Quarterly performance review meetings and follow ups would be helpful in expeditious and quality implementation of ADP schemes.

5.4 Expediting Releases of PSDP

Punjab has a 10 billion ADP 2009-10 portfolio, which has 5 billion of PSDP. PSDP releases are however hardly delayed and are far short of the requirements. This has resulted in serious implementation issues – the on-going projects are not timely funded, the completion of work is delayed, cost over-runs are being experienced, and the project benefits are not being realized. There is urgent need to take up the matter with the Federal Government for expediting release of adequate PSDP funds to implement and complete the projects as planned.

5.5 Irrigation and Water Management System Modernization

Irrigation and water management system modernization is planned to continue through financing provided under various foreign-aided programs. The comprehensive arrangement in this regard would include development and use of management information system, monitoring and design support system, modernization of real-time water management equipment and facilities and preparation of future irrigation and water distribution improvement projects. This would also include development and uses of modern database and GIS system models for improving planning and operations of the complex irrigation system. Planning, forecasting and operational tools developed in this way would assist in management of seasonal and ten daily allocations and would provide a better linkage with the reservoir operations/ decisions by IRSA.

5.6 Increase in Abiana

Currently, abiana assessment covers only 25-30% of O&M expense of the Department, where it used to be more than the O&M expenses of the Department upto the year 1973-74. The current status is given below:

Table 5-2: O&M Expenditure Vs Abiana Assessed

I-	**FY 2007-08**	**(Rs. Million)**
	O&M Budget	6,792
	Amount Recoverable*	2,519
	Abiana Assessed	1,923
	Shortfall (31%)	519
II-	**FY 2009-10**	
	O&M Budget	8,596
	Amount Recoverable*	3,188
	Abiana Assessed	1,923
	Shortfall (66%)	1,265
* Indicated amounts are as per O&M cost sharing principles		

Source: Punjab Irrigation & Power Department 2009

A new system of flat rate abiana assessment was introduced in 2003 to make the pricing system simpler and more transparent for the farming community. Despite low level of water charges, it remains to be a sensitive socio-political issue and even minor increases in the rates are strongly debated and challenged at every forum. In this backdrop, the proposed strategies for water pricing, cost sharing framework and participatory management regime need to be evolved to ensure efficiency and sustainability of the system. For improving abiana collection, I&P Department needs to continuously follow up with revenue functionaries.

The guiding principles and approaches for setting water rates and parameters for water pricing policy which are generally adopted world over and may be considered for adoption in Punjab case as well may include:

Approaches for Setting Water Rates

- The cost of providing irrigation water
- The benefits derived from irrigation
- Beneficiaries ability and willingness to pay water rates

Parameters for Water Pricing Policy

- Revenue needs of the system
- Equitable distribution of water and its cost
- Incentive for efficient use of water and capital
- Simple tariff rate structure
- Environmental considerations

In view of the foregoing, the abiana rates need to be enhanced to cover the O&M costs as per agreed cost sharing framework, as presented below:

Table 5-3: Present and Proposed Abiana Rates

(Rs/Acre)

Crop Season	Present Rates Effective from Kharif 2003	Rates as Proposed on the Basis of 2009-10 Budget
Kharif	85	145
Rabi	50	85
Total:	**135**	**230**

Source: Punjab Irrigation & Power Department 2009

In addition to increase in abiana, the rates for allowing additional water to fish farms and garden areas need immediate revision. The rates for disposal of waste water and treated industrial effluents into drainage system can be increased many folds.

5.7 Development of Comprehensive Performance Assessment Framework

Performance assessment and monitoring is being carried out by Program Monitoring and Implementation Unit; an exclusive set-up in the Irrigation Department. The current scope of PMIU covers monitoring of channels operations, publication of daily discharge data on website, regular surprise checking of about 10% gauges at head and tails of channels to ascertain correctness of data provided by field formations and proper checking for feeding of tails and equitable distribution of water, calibration of gauges to facilitate fair and equitable distribution of water among the stakeholders, monitoring of *Moghas* (outlets) of tertiary channels (watercourses) to ensure transparent distribution of water supply and to control water theft and development of Complaint Management System to improve quality, efficiency and accountability with which irrigation services are delivered.

In pursuance of performance evaluation by PMIU the fortnightly performance assessments of canal divisions are made on the weight age average on the following indicators:

- Dry and short tails
- Excessive tails
- Authorized tails
- Water losses / un-accounted water
- Percentage of channels for which data is not received from Filed Divisions
- Difference of head gauges checked by PMIU staff vs. gauges conveyed by field divisions
- Difference of tail gauges checked by PMIU staff vs. gauges conveyed by field divisions

For improved operational performance monitoring and accountability assessment development of modern tools is very important. Capacity building and training of PMIU staff are essential in addition to development of performance monitoring systems. More emphasize is to be given to real time discharge monitoring and observations of canal systems.

There is a need to develop a comprehensive performance assessment and link it to the inputs of the current and development budget. This is a challenging task and may require a phased approach for implementation. The existing performance monitoring system can be a good starting point in this regard and the Department needs to build on this. For this purpose, input of technical assistance training and capacity building would be required, which may be provided by PRMP.

5.8 Institutional Reforms

Institutional Reforms focus on decentralization, participatory management, empowerment of farmers and improved service and sustainability. For improving Farmers Organizations performance, following recommendations were made by the Working Group constituted under the direction of Chief Minister Punjab:

- ✓ Improving FOs systems, staffing and internal controls
- ✓ Enhancing support by PIDA/AWB/Canal Officers
- ✓ Effective monitoring and backup support
- ✓ Necessary adjustment in rules/regulations
- ✓ Measures for improving abiana collection

5.9 Human Resources Management

Human resources management is a vital area where I&P Department needs to give much more attention by not only recruitment of fresh SDOs but also by providing ample training and development opportunities to the existing staff in engineering and management disciplines. For achieving operational efficiency the redundant functions / posts need to be identified and abolished.

A proportionate funding of establishment and M&R costs is to be achieved over the coming years. MTBF cell of I&P has helped in the preparation of budget for the period 2009 to 2012. There is need to monitor the performance of staff as per goals and objectives of the department. A special wing through adjustment can be created for this purpose.

It is recommended that a study on human resources functional analysis, including staffing requirements, work load and adequacy of work load, training needs assessment, career planning and performance evaluations may be carried out for achieving the departmental goals and objectives.

APPENDICES

Appendix–1

KEY INPUTS & OUTPUTS – CURRENT BUDGET

KEY INPUTS AND OUTPUTS – CURRENT BUDGET

Canal Irrigation

S.No	Key Inputs	UOM	Estimate 2009-10	Forecast 2010-11	Forecast 2011-12	S.No	Key Outputs	UOM	Target 2009-10	Target 2010-11	Target 2011-12	Outcome
1.	Staff	No.	32196	32196	32196	1	Supplies of canal water to distribution channels					-Improved equity and reliability of canal water distribution -Maintain regular supply of water to the tails and reduce dry and short tails to the minimum
							a) Kharif Crops	MAF	35	35	35	
2	Vehicle	No.	250	251	251		b) Rabi Crops	MAF	20	20	20	
						2.	Strengthening of canal banks	Canal Miles	2835	2089	2184	
3	Computers	No.	154	165	171	3	**Repair of Structures**					
							a) Fall structures	No.	261	267	296	
4	POL	Ltr.	1486040	1524222	1535065		b) Bridges	No.	449	493	514	
							c) Head Regulators	No.	306	324	329	
5	Plant & Machinery						d) Escape structures	No.	15	17	16	
						4	Desilting of Canals	Canal Miles	2500	2500	2500	
a	Excavator	No.	27	27	27	5	Desilting of tail areas	Miles	6727	6901	7040	
						6	Repair of outlets, distributaries and minors	No.	4426	4547	4597	
b	Dozer	No.	9	9	9	7	Inspection Reports	No.	656	606	556	
						8	No. of filed visits	No.	17229	17425	17592	
c	Scraper	No.	6	6	6	9	Strengthening of Guide Bunds	Nos.	1	1	1	
						10	Painting of Barrage Machinery	No.	15	15	11	
d	Machinery (Different types)	No.	274	274	274	11	Painting Gates of Barrage	No.	56	56	56	
						12	Strengthening of Spurs	No.	5	4	3	
e	Survey Instruments (Different Types)	No.	7	7	7	13	Repair of Structure / Dam	No.	36	36	36	
						14	No. of Dams	No.	25	25	25	

Drainage, Flood and Salinity Control

S.No	Key Inputs	UOM	Estimate 2009-10	Forecast 2010-11	Forecast 2011-12	S.No	Key Outputs	UOM	Target 2009-10	Target 2010-11	Target 2011-12	Outcome
1.	Staff	No.	9308	9308	9308	1	Desilting of Drains	Cft (M)	94	97	100	- Improved drainage and environmental conditions by maintaining a water level of 0'-5' and 5'-10' to control water logging and salinity
						2	Structure Repair	No.	917	929	942	
						3	Repair of banks	Cft (M)	29	31	33	
2	Vehicle	No.	64	64	64	4	Flood Protection Spurs (River training Works)	No.	119	108	79	
						5	Strengthening of Flood embankments	Miles	228	231	239	
						6	Watching and maintaining flood embankment	Miles	506	547	531	
						7	Field Visits	No.	3922	4315	4390	
3	Computers	No.	30	30	30	8	Re operating of Tube wells	No.	76	98	98	
						9	Repair of Gates at Various Canals	No.	30	30	30	
						10	Groundwater samples and Testing	No.	12500	13400	14500	
						11	Soil Samples & Testing	No.	5909	6434	6951	
4	POL	Liters.	236422	248828	262158	12	Total Area covered for land reclamation	Acre	210300	210310	210325	

Appendix–2

ANNUAL DEVELOPMENT PROGRAM
2006-07 TO 2008-09

ANNUAL DEVELOPMENT PROGRAM 2005-06 FOR THE MONTH OF JUNE, 2006

(Rs. in Million)

Sr. No.	Name of Scheme	ON-GOING SCHEMES				NEW SCHEMES				ADDITIONAL SCHEMES				TOTAL			
		Allocat-ion for 2005-06	Funds Releas-ed by F.D	Expendi ture upto June 2006	%age over Rele-ase	Alloca-tion for 2005-06	Funds Releas-ed by F.D	Expendit ure upto June 2006	%age over Rele-ase	Alloca-tion for 2005-06	Funds Releas-ed by F.D	Expen diture upto June 2006	%age over Relea se	Allocat-ion for 2005-06	Funds Relea-sed by F.D	Expenditure upto June 2006	%age over Release
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Survey Investigation & Research	42.600	42.600	40.949	96	19.500	11.000	6.100	31	32.000	9.000	7.773	24	94.100	62.600	54.822	58
2	Irrigation	663.206	655.336	645.560	97	911.771	907.919	904.335	99	70.886	66.990	59.805	84	1645.863	1630.245	1609.700	98
3	Small Dams	527.944	527.944	527.816	100	260.100	260.100	260.063	100	0.000	0.000	0.000	0	788.044	788.044	787.879	100
4	Drainage & Relcamation	592.334	587.334	587.334	99	96.807	81.807	81.303	84	0.000	0.000	0.000	0	689.141	669.141	668.637	97
5	Flood Works	0.000	0.000	0.000	0	177.548	177.548	177.548	100	89.103	60.000	60.000	67	266.651	237.548	237.548	89
6	Foreign Aided Projects	491.473	486.473	486.415	99	16.350	16.350	15.225	93	0.000	0.000	0.000	0	507.823	502.823	501.640	99
7	Building Works	5.093	5.093	5.092	100	85.329	85.329	85.190	100	0.000	0.000	0.000	0	90.422	90.422	90.282	100
8	Miscellaneous Works	9.679	9.679	9.679	100	5.000	5.000	4.999	100	0.000	0.000	0.000	0	14.679	14.679	14.678	100
9	Power	5.000	5.000	5.000	100	0.000	0.000	0.000	0	0.000	0.000	0.000	0	5.000	5.000	5.000	100
	Total Water & Power Sector	**2337.329**	**2319.459**	**2307.845**	**99**	**1572.405**	**1545.053**	**1534.763**	**98**	**191.989**	**135.990**	**127.578**	**66**	**4101.723**	**4000.502**	**3970.186**	**97**

ANNUAL DEVELOPMENT PROGRAM 2006-07 FOR THE MONTH OF JUNE, 2007

(Rs. in Million)

Sr. No.	Name of Scheme	ON-GOING SCHEMES				NEW SCHEMES				ADDITIONAL SCHEMES				TOTAL			
		Allocation for 2006-07	Funds Released by F.D	Expend i-ture upto 2006-07	%age over Rel-ease	Alloca-tion for 2006-07	Funds Releas-ed by F.D	Expend i-ture upto 2006-07	%ag e over Rel-ease	Allocat-ion for 2006-07	Funds Releas-ed by F.D	Expend i-ture upto 2006-07	%ag e over Rel-ease	Allocation for 2006-07	Funds Released by F.D	Expenditur e upto 2006-07	%age over Release
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Survey Investigation & Research	50.941	45.459	34.374	76	65.055	25.432	20.669	81	0.000	0.000	0.000	0	115.996	70.891	55.043	78
2	Irrigation	1440.811	1372.714	1314.003	96	290.613	280.613	280.353	100	999.701	999.101	727.106	73	2731.125	2652.428	2321.462	88
3	Drainage & Relcamation	543.603	543.603	543.574	100	7.225	1.725	1.684	98	0.000	0.000	0.000	0	550.828	545.328	545.258	100
4	Flood Works	136.434	136.434	136.434	100	303.063	271.348	245.873	91	0.000	0.000	0.000	0	439.497	407.782	382.307	94
5	Small Dams	526.661	485.311	478.319	99	0.000	0.000	0.000	0	0.000	0.000	0.000	0	526.661	485.311	478.319	99
6	Building Works	162.784	161.184	159.378	99	60.436	52.436	45.378	87	0.000	0.000	0.000	0	223.220	213.620	204.756	96
7	Miscellaneous Works	38.762	23.202	15.667	68	10.000	10.000	9.990	100	0.000	0.000	0.000	0	48.762	33.202	25.657	77
8	Power	1.766	1.766	1.766	100	0.000	0.000	0.000	0	0.000	0.000	0.000	0	1.766	1.766	1.766	100
9	Foreign Aided Projects	2656.601	4679.695	4677.538	100	1.091	1.091	1.091	100	0.000	0.000	0.000	0	2657.692	4680.786	4678.629	100
10	Chief Minister's Accellerated Program	80.475	80.475	80.475	100	114.000	69.000	68.665	100	0.000	0.000	0.000	0	194.475	149.475	149.140	100
	Total Water & Power Sector	**5638.838**	**7529.843**	**7441.528**	**99**	**851.483**	**711.645**	**673.703**	**95**	**999.701**	**999.101**	**727.106**	**73**	**7490.022**	**9240.589**	**8842.337**	**96**

ANNUAL DEVELOPMENT PROGRAM 2007-08 FOR THE MONTH OF JUNE, 2008

Sr. No.	Name of Scheme	ON-GOING SCHEMES						NEW SCHEMES						ADDITIONAL SCHEMES				TOTAL					
		Allocation for 2007-08		Funds Released by F.D		Expendi-ture upto 2007-08	%age over Rel-ease	Allocation for 2007-08		Funds Released by F.D		Expendi-ture upto 2007-08	%age over Rel-ease	Alloca-tion for 2007-08	Funds Relea-sed by F.D	Expen-diture upto 2007-08	%age over Rel-ease	Allocation for 2007-08		Funds Released by FD		Expend-iture upto 2007-08	%age over Rel-ease
		Local	Foreign	Local	Foreign			Local	Foreign	Local	Foreign							Local	Foreign	Local	Foreign		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	Survey Investigation & Research	66.418	0.00	65.70	0.00	58.14	89	26.32	0.00	21.16	0.00	18.73	89	0.00	0.00	0.00		92.74	0.00	86.865	0.000	76.881	89
2	Irrigation	1317.94	0.00	1310.2	0.00	1277.58	98	256.46	0.00	256.46	0.00	252.04	98	14.34	14.34	12.28	86	1588.76	0.00	1581.056	0.000	1541.875	98
3	Drainage & Reclamation	398.681	0.00	390.68	0.00	390.42	100	167.00	0.00	167.00	0.00	148.78	89	0.00	0.00	0.00		565.68	0.00	557.684	0.000	539.207	97
4	Flood Works	33.28	0.00	33.28	0.00	33.27	100	604.22	0.00	604.22	0.00	479.00	79	5.79	5.79	0.00	0	643.29	0.00	643.296	0.000	512.275	80
5	Small Dams	386.884	0.00	335.25	0.00	334.79	100	615.06	0.00	615.06	0.00	611.36	99	3.34	3.34	2.28	68	1005.29	0.00	953.667	0.000	948.445	99
6	Building Works	153.44	0.00	150.44	0.00	142.29	95	87.72	0.00	87.72	0.00	87.24	99	11.97	11.97	7.99	67	253.14	0.00	250.144	0.000	237.543	95
7	Miscellaneous Works	27.50	0.00	26.37	0.00	21.68	82	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00		27.50	0.00	26.370	0.000	21.681	82
8	Power	0.35	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.35	0.00	0.000	0.000	0.000	
9	Foreign Aided Project	406.18	3680.30	406.18	3147.83	3456.37	97	64.39	1360.60	64.00	0.00	11.70	18	0.00	0.00	0.00		470.57	5040.93	470.183	3147.803	3468.074	96
10	Chief Minister's Accelerated Program	47.56	0.00	38.06	0.00	38.05	100	25.45	0.00	25.45	0.00	24.39	96	0.00	0.00	0.00		73.02	0.00	63.523	0.000	62.452	98
	Sub Total:	2838.51	3680.30	2756.26	3147.83			1846.62	1360.60	1841.11	0.00							4720.38	5040.93	4632.788	3147.803		
	Total Water & Power Sector:	6518.55		5904.02		5752.52	97	3207.29		1841.101		1633.27	89	35.46	35.46	22.56	64	9761.30		7780.591		7408.43	95

ANNUAL DEVELOPMENT PROGRAM 2008-09 FOR THE MONTH OF JUNE, 2009

(Rs. in Million)

Sr. No.	Name of Scheme	ON-GOING SCHEMES					NEW SCHEMES					TOTAL			
		Allocation for 2008-09	Funds Released by F.D		Funds Utilized		Allocation for 2008-09	Funds Released by F.D		Funds Utilized		Allocation for 2008-09	Funds Released by F.D	Expenditure upto June 2008-09	%age over Release
		Local + Foreign	During the Month June	Total upto the Month June	During the Month June	Total upto the Month June	Local + Foreign	During the Month June	Total upto the Month June	During the Month June	Total upto the Month June	Local + Foreign			
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Survey Investigation & Research	78.697	13.670	78.697	13.977	73.146	16.486	0.000	16.486	0.747	5.585	95.183	95.183	78.731	83
2	Irrigation	1516.220	-141.699	1516.220	231.347	1416.528	387.866	58.177	387.866	67.115	310.178	1904.086	1904.086	1726.706	91
3	Drainage & Relcamation	258.365	67.533	258.365	18.244	225.786	657.444	582.405	657.405	18.212	592.287	915.809	915.770	818.073	89
4	Flood Works	80.899	50.000	80.899	10.595	60.550	519.000	444.000	519.000	37.000	369.000	599.899	599.899	429.550	72
5	Small Dams	744.163	-42.859	744.163	77.076	739.571	38.615	38.615	38.615	0.050	0.050	782.778	782.778	739.621	94
6	Building Works	157.081	0.000	157.171	10.095	132.780	130.279	130.279	130.279	28.151	118.078	287.360	287.450	250.858	87
7	Miscellaneous Works	36.924	0.000	36.924	4.404	35.392	0.000	0.000	0.000	0.000	0.000	36.924	36.924	35.392	96
8	Foreign Aided Projects	3520.920	1103.441	4582.528	406.455	4534.550	1162.916	0.000	27.951	4.277	7.126	4683.836	4610.479	4541.676	99
9	Power	1.000	0.000	1.000	0.000	0.810	0.000	0.000	0.000	0.000	0.000	1.000	1.000	0.810	81
10	Additional	0.000	0.000	0.000	0.000	0.000	298.438	0.000	298.156	0.008	289.765	298.438	298.156	289.765	97
	Sub Total:	**6394.269**	**1050.086**	**7455.967**	**772.193**	**7219.113**	**3211.044**	**1253.476**	**2075.758**	**155.560**	**1692.069**	**9605.313**	**9531.725**	**8911.182**	**93**
	Total Water & Power Sector:	**6394.269**	**7455.967**		**7219.113**		**3211.044**	**2075.758**		**1692.069**		**9605.313**	**9531.725**	**8911.182**	**93**

MEDIUM TERM DEVELOPMENT FRAMEWORK 2009-12

Sr. No	Name of Sub Sector	On going Programs		New		Total		Allocations on 2010-11			Allocations on 2011-12			Throw Forward Beyond June 2012		
		No. of Schemes	Allocation	No. of Schemes	Allocation	No. of Schemes	Allocation	Ongoing	New	Total	Ongoing	New	Total	Ongoing	New	Total
1	Survey Investigation & Research	7	185.362	1	1.000	8	186.362	230.000	1.000	231.000	237.000	1.000	238.000	8.734	0.000	8.734
2	Irrigation	12	1104.910	11	252.480	23	1357.390	200.000	2709.400	2909.400	121.000	2406.000	2527.000	0.000	22287.000	22287.000
3	Drainage	6	1025.800	10	250.290	16	1276.090	465.000	1018.000	1483.000	308.000	852.000	1160.000	0.000	0.000	0.000
4	Flood works	2	1156.403	3	194.570	5	1350.973	0.000	200.000	200.000	0.000	140.000	140.000	0.000	1605.000	1605.000
5	Small Dams	7	1010.474	1	50.000	8	1060.474	872.000	200.00	1072.000	364.000	250.000	614.000	0.000	0.000	0.000
6	Building	7	236.296	1	70.000	8	306.296	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7	Miscellaneous	2	53.296	2	120.000	4	173.298	50.000	239.600	289.600	50.000	201.0000	251.000	202.960	0.000	202.960
8	Foreign Aided Projects	7	4193.457	2	95.660	9	4289.117	617.000	6317.000	6315.000	7422.000	1648.000	9070.000	15127.622	7685.000	22812.622
Total		**50**	**8966.000**	**31**	**1034.000**	**81**	**10000.000**	**7515.000**	**4985.000**	**12500.000**	**8502.000**	**5492.000**	**14000.000**	**15339.316**	**31577.000**	**46916.316**

Appendix–3

PSDP ALLOCATIONS

PSDP Allocations, Releases & Expenditures

Names of Project	2006-07			2007-08			2008-09			2009-10		
	Allocation	Releases	Expenditures	Allocation	Releases	Expenditures	Allocation	Releases	Expenditures	Allocation	Releases	Expenditures
Irrigation Systems Rehabilitation Project (ISRP)	1,756	1,411	1,411	1,975	1,997	1,993	1,000	576	575	1,000	200	200
Lining of Irrigation Channels (Distributaries & Minors) in Punjab	950	975	801	725	635	620	1,000	190	180	1,000	700	115
Protecting Towns, Villages (Basti Mian Khan to Basti Bukhara etc) and infrastructure from erosive action of River Indus in District Bhakkar	-	-	-	200	200	200	100	83	83	98	29	20
Remodeling of SMB Link RD 0+000 to 374+983 (Tail) and Bahawal Canal Lower from RD 152+000 to 239+580 (Tail)	100	60	60	90	130	-	100	15	15	50	-	37
Punjab barrages Rehabilitation and Modernization Project	270	140	23	500	125	454	100	15	183	150	-	-

Appendix–4

BUDGET ALLOCATION AND UTILIZATION OF M&R WORKS 2007-08

Budget Allocation and Utilization of M&R Works 2007-08

Circle / Division	Budget Allocation	Cost of Work Plan	Contracts Planned		Contracts Awarded		Contracts Completed		Contracts Remained In-Complete		Budget Utilized
	Amount	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount	Amount
1	2	3	4	5	6	7	8	9	10	11	12
LAHORE ZONE											
Depalpur Canal Circle											
CBDC Division	54.509	54.500	311	54.500	311	54.500	311	54.500	0	0	54.500
Kasur Division	20.853	17.203	133	17.203	133	17.203	133	17.203	0	0	17.203
Khanwah Division	19.233	18.723	128	18.723	128	18.723	128	18.723	0	0	18.723
Total Depalpur Canal Circle	**94.585**	**90.426**	**572**	**90.426**	**572**	**90.426**	**572**	**90.426**	**0**	**0**	**90.426**
Upper Chenab Canal Circle											
Marala Division	30.505	30.505	96	30.505	96	30.505	96	30.505	0	0	30.505
Gujranwala Division	19.104	19.101	315	19.101	315	19.101	315	19.101	0	0	19.101
Sheikhupura Division	20.571	20.231	77	20.231	77	20.231	77	20.231	0	0	20.231
Total Upper Chenab Canal Circle	**70.180**	**69.837**	**488**	**69.837**	**488**	**69.837**	**488**	**69.837**	**0**	**0**	**69.837**
Link Circle											
Pasrur Link Division	35.511	35.511	53	25.905	53	25.905	53	25.905	0	0	35.511
Flood Bund Division, Narowal	7.721	7.085	11	7.085	11	7.085	11	7.085	0	0	7.085
BS Link Division	8.455	8.847	24	8.455	15	3.945	24	8.451	0	0	8.451
Chakbandi Division	42.009	42.009	61	42.009	61	42.009	61	42.009	0	0	42.009
Total Link Circle	**93.696**	**93.452**	**149**	**83.454**	**140**	**78.944**	**149**	**83.450**	**0**	**0**	**93.056**
Lahore Drainage Circle											
Lahore Drainage Division	7.437	8.710	20	8.710	20	7.140	20	6.499	0	0	6.499
Rechna Drainage Division	14.609	14.450	25	14.483	25	14.483	25	14.483	0	0	14.483
Total Lahore Drainage Circle	**22.046**	**23.160**	**45**	**23.193**	**45**	**21.623**	**45**	**20.982**	**0**	**0**	**20.982**
TOTAL LAHORE ZONE	**280.507**	**276.875**	**1254**	**266.910**	**1245**	**260.830**	**1254**	**264.695**	**0**	**0**	**274.301**

Budget Allocation and Utilization of M&R Works 2007-08

Circle / Division	Budget Allocation	Cost of Work Plan	Contracts Planned		Contracts Awarded		Contracts Completed		Contracts Remained In-Complete		Budget Utilized
	Amount	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount	Amount
1	2	3	4	5	6	7	8	9	10	11	12
FAISALABAD ZONE											
LCC (East) Circle											
Khanki Division	20.923	22.608	148	22.608	148	22.608	148	20.921	0	0	20.921
Upper Gugera Division	12.255	14.183	120	11.968	116	11.513	111	10.975	6	0.542	11.942
Lower Gugera Division	7.817	7.788	74	7.788	74	7.788	70	7.504	4	0.284	7.535
Burala Division	15.309	15.008	123	16.543	112	15.248	108	14.712	4	0.252	14.712
Total LCC (East) Circle	**56.304**	**59.587**	**465**	**58.907**	**450**	**57.161**	**437**	**54.111**	**14**	**1.078**	**55.110**
LCC (West) Circle											
Hafizabad Division	20.882	20.882	245	20.860	239	20.169	144	15.683	93	4.474	15.683
Faisalabad Division	14.155	14.775	111	14.775	109	12.936	105	12.432	4	0.206	12.421
Jhang Division	20.755	22.338	152	22.338	152	20.218	149	19.890	3	0.390	20.755
Total LCC (West) Circle	**55.792**	**57.995**	**508**	**57.953**	**500**	**53.386**	**398**	**48.005**	**100**	**5.07**	**48.859**
Faisalabad Drainage Circle											
Faisalabad Drainage Division	8.494	9.282	70	9.282	69	9.182	66	7.667	4	0.882	7.667
Sammundri Drainage Division	13.034	12.799	70	12.799	70	13.893	70	12.923	0	0	12.923
Total Faisalabad Drainage Circle	**21.528**	**22.081**	**140**	**22.081**	**139**	**23.075**	**136**	**20.590**	**4**	**0.882**	**20.590**
Q.B. Link Circle											
Qadirabad Barrage Division	23.844	26.948	233	26.948	207	22.479	207	22.479	0	0	23.844
Q.B. Link Division	10.111	10.907	133	10.907	124	10.192	124	10.192	0	0	10.111
Total Q.B. Link Circle	**33.955**	**37.855**	**366**	**37.855**	**331**	**32.671**	**331**	**32.671**	**0**	**0**	**33.955**
Development Circle											
Development Division-II	0.340	0.525	1	0.525	1	0.525	1	0.340	0	0	0.340
Total Development Circle	**0.340**	**0.525**	**1**	**0.525**	**1**	**0.525**	**1**	**0.340**	**0**	**0**	**0.340**
TOTAL FAISALABAD ZONE	**167.919**	**178.043**	**1480**	**177.321**	**1421**	**166.818**	**1303**	**155.718**	**118**	**7.030**	**158.854**

Budget Allocation and Utilization of M&R Works 2007-08

Circle / Division	Budget Allocation	Cost of Work Plan	Contracts Planned		Contracts Awarded		Contracts Completed		Contracts Remained In-Complete		Budget Utilized
	Amount	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount	Amount
1	2	3	4	5	6	7	8	9	10	11	12
SARGODHA ZONE											
UJC Circle											
Jhelum Division	22.490	25.260	181	25.260	171	22.490	171	22.490	0	0	22.490
Gujrat Division	25.890	25.890	201	25.890	201	25.890	201	25.890	0	0	25.890
Total UJC Circle	**48.380**	**51.150**	**382**	**51.150**	**372**	**48.380**	**372**	**48.380**	**0**	**0**	**48.380**
LJC Circle											
Rasul Division	29.308	33.040	114	33.040	100	28.880	100	28.880	0	0	28.880
Sargodha Division	20.434	23.529	116	20.509	116	20.509	115	20.364	1	0.145	20.364
Kirana Division	17.623	19.956	86	18.671	84	18.662	79	16.908	5	1.754	16.908
Shahpur Division	5.888	6.402	70	6.184	70	6.184	70	5.888	0	0	5.888
Total LJC Circle	**73.253**	**82.927**	**386**	**78.404**	**370**	**74.235**	**364**	**72.040**	**6**	**1.899**	**72.040**
Drainage Circle											
Sargodha Drainage Division	18.996	18.996	147	18.996	146	18.940	146	18.750	0	0	18.750
Mandi Bahauddin Drainage Division	6.420	6.570	32	6.195	32	6.445	26	6.195	6	0.250	6.195
Total Drainage Circle	**25.416**	**25.566**	**179**	**25.191**	**178**	**25.385**	**172**	**24.945**	**6**	**0.250**	**24.945**
Thal Canal Circle											
Kalabagh Division	15.460	25.774	156	25.371	135	15.949	132	14.645	3	1.304	14.645
Khushab Division	50.240	50.240	136	50.240	136	50.240	105	30.632	31	19.608	30.632
Bakhar Division	19.444	21.227	166	21.227	148	19.194	134	16.780	14	2.664	16.780
Layyah Division	15.986	18.515	137	18.308	122	16.323	118	14.864	4	1.122	14.864
Total Thal Canal Circle	**101.130**	**115.756**	**595**	**115.146**	**541**	**101.706**	**489**	**76.921**	**52**	**24.698**	**76.921**
TOTAL SARGODHA ZONE	**248.179**	**275.399**	**1542**	**269.891**	**1461**	**249.706**	**1397**	**222.286**	**64**	**26.847**	**222.286**

Budget Allocation and Utilization of M&R Works 2007-08

Circle / Division	Budget Allocation	Cost of Work Plan	Contracts Planned		Contracts Awarded		Contracts Completed		Contracts Remained In-Complete		Budget Utilized
	Amount	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount	Amount
1	2	3	4	5	6	7	8	9	10	11	12
MULTAN ZONE											
LBDC Circle											
Balloki Headworks Division	40.666	40.248	96	40.248	96	37.868	96	36.53	0	0	36.53
Okara Division	13.485	17.99	63	17.99	61	14.893	55	13.476	0	0	13.476
Sahiwal Division	24.63	28.28	170	25.325	141	21.17	144	23.06	0	0	23.06
Khanewal Division	16.595	23.76	143	23.76	115	15.433	112	15.385	0	0	15.385
Total LBDC Circle	**95.376**	**110.278**	**472**	**107.323**	**413**	**89.364**	**407**	**88.451**	**0**	**0**	**88.451**
Haveli Canal Circle											
Trimmu Headworks Division	33.901	38.351	205	38.351	205	38.389	123	33.729	0	0	33.729
Multan Division	15.054	19.82	91	19.82	74	16.412	70	12.329	0	0	12.329
Shujabad Division	45.402	49.283	168	49.283	163	48.646	157	45.318	0	0	45.318
Total Haveli Canal Circle	**94.357**	**107.454**	**464**	**107.454**	**442**	**103.447**	**350**	**91.376**	**0**	**0**	**91.376**
Mailsi Canal Circle											
Islam Headworks Division	13.263	14.713	72	14.713	63	13.957	63	13.326	0	0	13.326
Ladhran Division	16.832	29.966	91	29.966	74	11.788	61	8.024	0	0	8.024
Total Mailsi Canal Circle	**30.095**	**44.679**	**163**	**44.679**	**137**	**25.745**	**124**	**21.350**	**0**	**0**	**21.350**
Nili Bar Canal Circle											
Suleimanki Headworks Division	18.00	18.00	163	18.00	163	18.00	163	18.00	0	0	18.00
Eastern Bar Division	16.574	16.55	148	16.55	148	16.55	148	16.55	0	0	16.55
Western Bar Division	18.903	22.827	138	22.827	138	22.827	117	15.561	0	0	15.561
Total Nili Bar Canal Circle	**53.477**	**57.377**	**449**	**57.377**	**449**	**57.377**	**428**	**50.111**	**0**	**0**	**50.111**
Development Circle											
Development Division-I	8.451	10.189	64	10.189	58	9.092	58	7.679	0	0	7.679
Development Division-II	0	0	0	0	0	0	0	0	0	0	0
Development Division-III	4.493	5.332	19	5.332	18	3.616	18	3.616	0	0	3.616
Total Development Circle	**12.944**	**15.521**	**83**	**15.521**	**76**	**12.708**	**76**	**11.295**	0	0	**11.295**
TOTAL MULTAN ZONE	**286.249**	**335.309**	**1631**	**332.354**	**1517**	**288.641**	**1385**	**262.583**	**0**	**0**	**262.583**

Budget Allocation and Utilization of M&R Works 2007-08

Circle / Division	Budget Allocation	Cost of Work Plan	Contracts Planned		Contracts Awarded		Contracts Completed		Contracts Remained In-Complete		Budget Utilized
	Amount	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount	Amount
1	2	3	4	5	6	7	8	9	10	11	12
BAHAWALPUR ZONE											
Bahawalnagar Canal Circle											
Fordwah Division	34.278	28.999	181	23.184	127	20.815	125	19.640	2	1.175	20.815
Sadiqia Division	22.736	31.370	97	24.977	97	24.977	91	22.751	6	2.226	22.737
Hakra Division	15.187	15.187	131	15.187	131	15.187	127	14.904	4	0.283	14.904
Total Bahawalnagar Canal Circle	**72.201**	**75.556**	**409**	**63.348**	**355**	**60.979**	**343**	**57.295**	**12**	**3.684**	**58.456**
Bahawalpur Canal Circle											
Bahawalpur Division	35.062	44.944	185	37.947	185	37.947	176	33.741	8	1.298	35.039
Mailsi Syphon Division	13.172	16.693	200	16.693	152	19.295	141	8.511	9	3.654	12.156
Ahmadpur East Division	23.277	26.400	180	26.400	165	22.116	163	22.138	2	1.075	23.213
Punjnad Headworks Division	25.901	27.011	61	27.011	61	27.011	43	13.174	14	12.610	25.784
Total Bahawalpur Canal Circle	**97.412**	**115.048**	**626**	**108.051**	**563**	**106.369**	**523**	**77.564**	**33**	**18.637**	**96.192**
Rahimyar Khan Canal Circle											
Khanpur Division	25.450	27.620	203	29.548	198	28.197	177	21.702	3	2.548	24.250
Rahimyar Khan Division	26.529	28.455	118	28.455	118	28.455	113	22.767	3	2.765	25.523
Dallas Division	15.089	16.660	87	16.660	65	13.733	65	13.733	0	0	13.733
Total Rahimyar Khan Canal Circle	**67.068**	**72.735**	**408**	**74.663**	**381**	**70.385**	**355**	**58.202**	**6**	**5.313**	**63.506**
TOTAL BAHAWALPUR ZONE	**236.681**	**263.339**	**1443**	**246.062**	**1299**	**237.733**	**1221**	**193.061**	**51**	**27.634**	**218.154**

Budget Allocation and Utilization of M&R Works 2007-08

Circle / Division	Budget Allocation	Cost of Work Plan	Contracts Planned		Contracts Awarded		Contracts Completed		Contracts Remained In-Complete		Budget Utilized
	Amount	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount	Amount
1	2	3	4	5	6	7	8	9	10	11	12
DG KHAN ZONE											
Derajat Canal Circle											
DG Khan Canal Division	16.448	20.725	130	20.725	108	19.881	107	19.367	0	1.500	16.367
Rajanpur Division	28.730	28.669	130	218.669	108	28.669	107	28.658	0	0	28.658
CRBC Division	8.837	11.795	55	10.534	44	8.837	44	8.837	0	0	8.837
Total Derajat Canal Circle	**54.015**	**61.189**	**315**	**249.928**	**260**	**57.387**	**258**	**56.862**	**0**	**1.500**	**53.862**
Muzaffargarh Canal Circle											
Taunsa Division	54.097	54.097	160	54.053	160	54.053	157	54.053	3	6.700	54.053
Kot Addu Division	33.858	33.858	97	33.858	97	33.858	91	33.858	0	0	33.858
Muzaffargarh Division	54.248	54.248	119	54.248	119	54.248	119	54.248	0	0	54.248
River Diversion Division	21.205	38.495	64	19.606	64	19.606	64	19.577	0	0	19.577
Total Muzaffargarh Canal Circle	**163.408**	**180.698**	**440**	**161.765**	**440**	**161.765**	**431**	**161.736**	**3**	**6.700**	**161.736**
Project Circle											
DG Khan Construction Division	10.436	23.359	45	10.408	45	10.408	45	10.408	0	0	10.408
Jampur Division	8.147	8.162	27	8.162	27	8.144	27	8.144	0	0	8.144
Total Project Circle	**18.583**	**31.521**	**72**	**18.570**	**72**	**18.552**	**72**	**18.552**	**0**	**0**	**18.552**
TOTAL DG KHAN ZONE	**236.006**	**273.408**	**827**	**430.263**	**772**	**237.704**	**761**	**237.150**	**3**	**8.2**	**234.150**

Budget Allocation and Utilization of M&R Works 2008-09

Circle / Division	Budget Allocation	Cost of Work Plan	Contracts Planned		Contracts Awarded		Contracts Completed		Contracts Remained In-Complete		Budget Utilized
	Amount	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount	Amount
1	2	3	4	5	6	7	8	9	10	11	12
LAHORE ZONE											
Depalpur Canal Circle											
CBDC Division	82.124	53.211	197	53.212	197	53.212	197	53.211	0	0	53.212
Kasur Division	28.361	28.344	188	28.344	182	28.322	182	28.319	0	0	28.319
Khanwah Division	23.471	23.471	135	23.471	133	22.124	130	22.150	5	0.135	22.150
Total Depalpur Canal Circle	**133.956**	**105.026**	**520**	**105.027**	**512**	**103.658**	**509**	**103.680**	**5**	**0.135**	**103.681**
Upper Chenab Canal Circle											
Marala Division	39.843	33.953	91	39.843	91	39.843	90	38.494	1	1.325	38.494
Gujranwala Division	27.611	23.552	136	23.552	136	27.611	135	27.559	1	0.520	27.559
Sheikhupura Division	26.960	20.271	99	26.960	99	26.960	99	26.850	0	0	26.850
Total Upper Chenab Canal Circle	**94.414**	**77.776**	**326**	**90.355**	**326**	**94.414**	**324**	**92.903**	**2**	**1.845**	**92.903**
Link Circle											
Pasrur Link Division	27.974	27.974	120	27.974	120	27.974	120	27.974	0	0	27.974
Flood Bund Division, Narowal	13.115	13.115	22	13.115	22	13.115	21	11.933	1	1.234	11.933
BS Link Division	9.064	9.064	33	9.064	33	9.064	33	9.064	0	0	9.064
Chakbandi Division	16.699	16.699	76	19.699	76	19.699	76	19.699	0	0	19.699
Total Link Circle	**66.852**	**66.852**	**251**	**69.852**	**251**	**69.852**	**250**	**68.670**	**1**	**1.234**	**68.670**
Lahore Drainage Circle											
Lahore Drainage Division	35.801	17.733	29	42.684	27	36.714	23	35.009	4	4.788	35.085
Rechna Drainage Division	18.739	18.683	49	18.683	49	18.883	49	18.386	0	0	18.683
Total Lahore Drainage Circle	**54.540**	**36.416**	**78**	**61.367**	**76**	**55.597**	**72**	**53.395**	**4**	**4.788**	**53.768**
TOTAL LAHORE ZONE	**349.762**	**286.070**	**1175**	**326.601**	**1165**	**323.521**	**1155**	**318.648**	**12**	**8.002**	**319.022**

Budget Allocation and Utilization of M&R Works 2008-09

Circle / Division	Budget Allocation	Cost of Work Plan	Contracts Planned		Contracts Awarded		Contracts Completed		Contracts Remained In-Complete		Budget Utilized
	Amount	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount	Amount
1	2	3	4	5	6	7	8	9	10	11	12
FAISALABAD ZONE											
LCC (East) Circle											
Khanki Division	31.463	31.463	242	34.704	240	33.473	237	31.403	3	1.436	31.403
Upper Gugera Division	27.689	30.296	230	30.296	230	30.296	226	29.903	4	0.393	27.648
Lower Gugera Division	14.959	14.865	97	14.865	88	13.460	97	14.865	0	0	14.865
Burala Division	18.847	18.822	207	18.693	195	17.561	195	17.561	0	0	17.561
Total LCC (East) Circle	**92.958**	**95.446**	**776**	**98.558**	**753**	**94.790**	**755**	**93.732**	**7**	**1.829**	**91.477**
LCC (West) Circle											
Hafizabad Division	19.537	22.991	252	16.334	252	16.334	274	19.109	0	0	19.109
Faisalabad Division	11.428	11.427	79	11.427	79	11.427	79	11.427	0	0	11.422
Jhang Division	17.825	17.733	118	17.733	118	17.733	118	17.733	0	0	17.733
Total LCC (West) Circle	**48.790**	**52.151**	**449**	**45.494**	**449**	**45.494**	**471**	**48.269**	**0**	**0**	**48.264**
Faisalabad Drainage Circle											
Faisalabad Drainage Division	6.918	7.329	49	7.142	47	6.893	47	6.741	0	0	6.741
Sammundri Drainage Division	39.187	53.079	73	39.771	73	39.771	73	38.705	0	0	38.705
Total Faisalabad Drainage Circle	**46.105**	**60.408**	**122**	**46.913**	**120**	**46.664**	**120**	**45.446**	**0**	**0**	**45.446**
Q.B. Link Circle											
Qadirabad Barrage Division	33.130	33.379	243	33.379	237	33.379	223	31.642	14	1.940	31.642
Q.B. Link Division	12.579	13.162	109	13.162	109	13.162	86	11.010	23	1.220	11.010
Total Q.B. Link Circle	**45.709**	**46.541**	**352**	**46.541**	**346**	**46.541**	**309**	**42.652**	**37**	**3.160**	**42.652**
Development Circle											
Development Division-II	0.183	0.147	8	0.147	8	0.147	8	0.147	0	0	0.179
Total Development Circle	**0.183**	**0.147**	**8**	**0.147**	**8**	**0.147**	**8**	**0.147**	**0**	**0**	**0.179**
TOTAL FAISALABAD ZONE	**233.745**	**254.963**	**1707**	**237.685**	**1676**	**233.668**	**1663**	**230.278**	**44**	**4.989**	**228.018**

Budget Allocation and Utilization of M&R Works 2008-09

Circle / Division	Budget Allocation	Cost of Work Plan	Contracts Planned		Contracts Awarded		Contracts Completed		Contracts Remained In-Complete		Budget Utilized
	Amount	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount	Amount
1	2	3	4	5	6	7	8	9	10	11	12
SARGODHA ZONE											
UJC Circle											
Jhelum Division	46.866	46.988	473	46.866	473	46.866	472	46.766	1	0.106	46.866
Gujrat Division	31.173	31.364	314	31.364	314	31.364	310	31.173	4	0.336	31.173
Total UJC Circle	**78.039**	**78.352**	**787**	**78.230**	**787**	**78.230**	**782**	**77.939**	**5**	**0.442**	**78.039**
LJC Circle											
Rasul Division	40.045	40.045	173	40.045	173	40.045	170	36.127	3	3.918	39.773
Sargodha Division	29.111	28.257	228	28.257	228	29.021	228	29.021	0	0	29.021
Kirana Division	26.263	26.250	107	26.250	107	26.250	107	26.188	0	0	26.263
Shahpur Division	19.515	19.515	66	19.515	66	19.515	66	19.291	0	0	19.291
Total LJC Circle	**114.934**	**114.067**	**574**	**114.067**	**574**	**114.831**	**571**	**110.627**	**3**	**3.918**	**114.348**
Drainage Circle											
Sargodha Drainage Division	48.916	48.887	139	48.887	139	48.887	139	48.884	0	0	48.916
Mandi Bahauddin Drainage Division	16.717	16.515	47	16.379	47	16.579	47	16.193	0	0	16.193
Total Drainage Circle	**65.633**	**65.402**	**186**	**65.266**	**186**	**65.466**	**186**	**65.077**	**0**	**0**	**65.109**
Thal Canal Circle											
Kalabagh Division	40.908	40.908	151	37.948	151	37.948	151	37.948	0	0	37.948
Khushab Division	90.616	90.616	221	90.616	221	90.616	221	89.956	0	0	89.956
Bakhar Division	29.789	30.325	167	30.325	167	30.325	141	26.295	5	1.532	28.236
Layyah Division	29.348	29.348	177	29.348	177	29.348	177	29.348	0	0	29.348
Total Thal Canal Circle	**190.661**	**191.197**	**716**	**188.237**	**716**	**188.237**	**690**	**183.547**	**5**	**1.532**	**185.488**
TOTAL SARGODHA ZONE	**449.267**	**449.018**	**2263**	**445.800**	**2263**	**446.764**	**2229**	**437.190**	**13**	**5.892**	**442.984**

Budget Allocation and Utilization of M&R Works 2008-09

Circle / Division	Budget Allocation	Cost of Work Plan	Contracts Planned		Contracts Awarded		Contracts Completed		Contracts Remained In-Complete		Budget Utilized
	Amount	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount	Amount
1	2	3	4	5	6	7	8	9	10	11	12
MULTAN ZONE											
LBDC Circle											
Balloki Headworks Division	51.925	52.953	118	91.925	117	51.881	117	51.845	0	0	51.845
Okara Division	37.944	37.070	228	41.002	226	37.730	221	37.944	0	0	37.944
Sahiwal Division	31.265	28.291	165	28.473	153	28.140	144	26.673	1	0.176	29.880
Khanewal Division	24.142	25.199	132	27.800	124	25.149	123	23.468	1	0.085	23.468
Total LBDC Circle	**145.276**	**143.513**	**643**	**189.200**	**620**	**142.900**	**605**	**139.930**	**2**	**0.261**	**143.137**
Haveli Canal Circle											
Trimmu Headworks Division	43.690	42.557	397	48.387	351	45.320	347	43.585	4	0.600	43.585
Multan Division	17.530	17.897	106	17.897	100	17.497	100	17.497	0	0	17.497
Shujabad Division	75.848	78.902	195	80.994	193	80.994	191	75.848	2	1.500	78.848
Total Haveli Canal Circle	**137.068**	**139.356**	**698**	**147.278**	**644**	**143.811**	**638**	**136.930**	**6**	**2.100**	**139.930**
Mailsi Canal Circle											
Islam Headworks Division	13.990	15.835	72	14.976	67	14.647	67	13.689	0	0	13.689
Ladhran Division	26.507	26.850	116	26.873	116	26.873	116	26.873	0	0	24.560
Total Mailsi Canal Circle	**40.497**	**42.685**	**188**	**41.849**	**183**	**41.520**	**183**	**40.562**	**0**	**0**	**38.249**
Nili Bar Canal Circle											
Suleimanki Headworks Division	23.042	23.042	256	29.057	256	23.924	253	23.024	3	0.898	23.040
Eastern Bar Division	16.470	17.080	138	17.080	138	16.424	138	16.424	0	0	16.424
Western Bar Division	17.186	19.795	129	17.826	109	16.388	109	16.218	0	0	17.059
Total Nili Bar Canal Circle	**56.698**	**59.917**	**523**	**63.963**	**503**	**56.736**	**500**	**55.666**	**3**	**0.898**	**56.523**
Development Circle											
Development Division-I	17.417	18.231	74	17.420	60	14.731	60	14.731	0	0	17.205
Development Division-II	6.936	6.773	39	6.773	39	6.773	39	6.773	0	0	6.773
Development Division-III	7.431	13.591	49	14.056	38	3.535	38	3.419	0	0	3.419
Total Development Circle	**31.784**	**38.595**	**162**	**38.249**	**137**	**25.039**	**137**	**24.923**	**0**	**0**	**27.397**
TOTAL MULTAN ZONE	**411.323**	**424.066**	**2214**	**440.539**	**2087**	**410.006**	**2063**	**398.011**	**11**	**3.259**	**402.236**

Budget Allocation and Utilization of M&R Works 2008-09

Circle / Division	Budget Allocation	Cost of Work Plan	Contracts Planned		Contracts Awarded		Contracts Completed		Contracts Remained In-Complete		Budget Utilized
	Amount	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount	Amount
1	2	3	4	5	6	7	8	9	10	11	12
BAHAWALPUR ZONE											
Bahawalnagar Canal Circle											
Fordwah Division	33.652	37.592	322	37.592	187	33.581	187	33.581	0	0	33.578
Sadiqia Division	39.128	34.389	57	13.931	57	13.369	56	12.653	1	0.700	37.498
Hakra Division	15.601	15.601	88	15.601	88	15.601	88	15.601	0	0	15.601
Total Bahawalnagar Canal Circle	**88.381**	**87.582**	**467**	**67.124**	**332**	**62.551**	**331**	**61.835**	**1**	**0.700**	**86.677**
Bahawalpur Canal Circle											
Bahawalpur Division	28.856	35.456	146	33.896	146	33.896	145	27.455	1	0.650	28.597
Mailsi Syphon Division	26.032	36.415	231	36.415	168	26.605	159	25.741	9	0.864	25.741
Ahmadpur East Division	33.165	37.334	234	37.334	226	3.786	208	29.011	6	2.387	29.011
Punjnad Headworks Division	27.980	28.507	95	30.130	91	29.645	87	26.749	4	1.218	27.170
Total Bahawalpur Canal Circle	**116.033**	**137.712**	**706**	**137.775**	**631**	**93.932**	**599**	**108.956**	**20**	**5.119**	**110.519**
Rahimyar Khan Canal Circle											
Khanpur Division	26.189	30.640	228	34.926	122	25.496	224	25.620	4	3.500	25.627
Rahimyar Khan Division	55.344	68.825	124	70.225	124	70.225	117	46.592	7	22.975	54.200
Dallas Division	23.556	23.308	28	15.105	28	15.105	28	15.105	1	0.143	23.000
Total Rahimyar Khan Canal Circle	**105.089**	**122.773**	**380**	**120.256**	**274**	**110.826**	**369**	**87.317**	**12**	**26.618**	**102.827**
TOTAL BAHAWALPUR ZONE	**309.503**	**348.067**	**1553**	**325.155**	**1237**	**267.309**	**1299**	**258.108**	**33**	**32.437**	**300.023**

Budget Allocation and Utilization of M&R Works 2008-09

Circle / Division	Budget Allocation	Cost of Work Plan	Contracts Planned		Contracts Awarded		Contracts Completed		Contracts Remained In-Complete		Budget Utilized
	Amount	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount	Amount
1	2	3	4	5	6	7	8	9	10	11	12
DG KHAN ZONE											
Derajat Canal Circle											
DG Khan Canal Division	30.918	68.714	235	68.714	196	33.518	173	30.918	23	2.815	30.918
Rajanpur Division	51.950	79.790	62	51.940	62	51.940	62	51.940	0	0	51.940
CRBC Division	17.196	20.187	90	20.187	80	17.135	77	17.135	13	3.052	17.196
Total Derajat Canal Circle	**100.064**	**168.691**	**387**	**140.841**	**338**	**102.593**	**312**	**99.993**	**36**	**5.867**	**100.054**
Muzaffargarh Canal Circle											
Taunsa Division	53.537	68.320	357	68.320	301	53.537	256	53.537	45	1.847	53.537
Kot Addu Division	47.458	49.680	180	53.116	150	47.169	150	47.330	0	0	47.330
Muzaffargarh Division	54.385	54.385	187	54.385	126	54.385	126	54.385	0	0	54.385
River Diversion Division	28.800	38.494	22	23.007	22	23.007	13	12.788	9	3.530	28.430
Total Muzaffargarh Canal Circle	**184.180**	**210.879**	**746**	**198.828**	**599**	**178.098**	**545**	**168.040**	**54**	**5.377**	**183.682**
Project Circle											
DG Khan Construction Division	10.746	24.290	58	24.290	38	10.746	38	10.676	0	0	10.676
Jampur Division	67.240	20.420	54	66.400	15	66.400	15	66.400	0	0	66.400
Total Project Circle	**77.986**	**44.710**	**112**	**90.690**	**53**	**77.146**	**53**	**77.076**	**0**	**0**	**77.076**
TOTAL DG KHAN ZONE	**362.230**	**424.280**	**1245**	**430.359**	**990**	**357.837**	**910**	**345.109**	**90**	**11.244**	**360.812**

Comparison of O&M Budget Estimates by Object Classification

S.No	Major object code	Major object classification	Actual expenditure 2007-08	Actual expenditure 2008-09	Budget estimate 2008-09	Budget estimate 2009-10	Budget estimate 2010-11	Budget Forecast 2011-12	Budget Forecast 2012-13
1	A01	Employee related expenses	3,606,218,000	4,012,457,986	3,520,223,000	4,990,036,000	5,567,082,712	5,678,414,029	5,790,333,386
2	A02	Project Pre-investment Analysis	2,437,000	3,589,631	3,640,000	8,800,000	8,800,000	8,800,000	8,800,000
3	A03	Operating expenses	583,644,000	359,332,190	439,806,000	497,481,000	588,262,225	614,884,541	649,020,465
4	A04	Employees Retirement Benefits	760,000	1,238,720	250,000	754,000	1,761,000	1,404,240	1,546,991
5	A05	Grants Subsidies Write off of Loan	14,100,000	18,800,000	420,098,000	5,000,000	2,700,000	600,000	600,000
6	A06	Transfers	73,000	76,395	478,000	649,000	519,572	557,275	601,841
7	A09	Physical Assets	29,000	115,840	-	5,896,000	3,700,000	1,142,000	1,210,000
8	A13	Repairs and Maintenance	1,979,611,000	2,426,017,610	3,040,289,000	3,088,250,000	2,771,836,632	2,982,149,387	3,152,720,391
	Grand Total		**6,186,872,000**	**6,821,628,372**	**7,424,784,000**	**8,596,866,000**	**8,944,662,141**	**9,287,951,472**	**9,604,833,074**

Appendix–5

PERFORMANCE EVALUATION/ ENGINEERING AUDIT OF M&R WORKS 2007-08

PERFORMANCE EVALUATION / ENGINEERING AUDIT OF M&R WORKS DURING FY 2007-08

The scope of services includes the following:

i) To obtain the annual work plans for implementing M&R / rehabilitation works, as prepared by each circle.

ii) To review the process of preparation of the annual work plan of each circle and determine if the prescribed procedures have been followed, and whether or not yardsticks have been considered.

iii) To randomly select schemes of M&R / rehabilitation works using statistical procedures and techniques from each circle so that the random sample is representative of the works carried out during the year 2007-08 (cost and quantum-wise). The selection must ensure picking at least 2 schemes of each category from every division of the circle.

iv) To review the process of data collection regarding selected M&R / rehabilitation works to establish the integrity and accuracy of the data collected for preparation for schemes, by adequate spot checks in the field.

v) To check the schemes to establish whether or not these have been prepared as per good technical practices e.g. proper engineering solutions adopted, adequate drawings or sketches, specifications etc were included in the tender documents.

vi) To review if the service times e.g. time for sanction of the engineers estimates etc have been adhered to.

vii) To review the bidding process and establish or otherwise if the prescribed procedures were followed and prescribed timeframe followed in awarding the contracts.

viii) In case the works selected are procured using “Force Account” mode of procurement, review and check if proper documentation had been prepared before embarking upon the implementation of schemes.

ix) To review if adequate inspections were made for checking the quality and quantity of work in the field, and if adequate documentation were prepared.

x) To verify the quality of work and quantity by adequate spot checks in the field on all the selected schemes.

xi) To verify the payments made on the basis of spot checks.

xii) To review and analyze the implementation schedule of each of the selected schemes to find out if the programs were adhered to, as conceived originally or there were delays. In case of delay, verify the reasons to find out if that could be avoided.

xiii) To prepare the performance report of each division on the basis of selected sample, compile the reports on the basis of each circle and in turn for each zone.

Budget Allocation and Utilization, No. of Contracts Planned, Awarded & Completed (2007-08)

Division-wise, Circle-wise and Zonal-wise information regarding budget allocation and utilization, number of contracts of M&R works awarded, completed and left incomplete during the financial year 2007-08 as provided by the Department is presented below for the following irrigation Zones. The overall position of all the 6 Zones of IPD is presented as under:

Zone	Budget Allocation	Cost of Work Plan	Contracts Planned		Contracts Awarded		Contracts Completed		Contracts Remained In-Complete		Budget Utilized
	Amount	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount	Amount
1	2	3	4	5	6	7	8	9	10	11	12
Lahore	280.507	276.875	1254	266.91	1245	260.83	1254	264.695	0	0	274.301
Faisalabad	167.919	178.043	1480	177.321	1421	166.818	1303	155.718	118	7.03	158.854
Sargodha	248.179	275.399	1542	269.891	1461	249.706	1397	222.286	64	26.847	222.286
Multan	286.249	335.309	1631	332.354	1517	288.641	1385	262.583	0	0	262.583
Bahawalpur	236.681	263.339	1443	246.062	1299	237.733	1221	193.061	51	27.634	218.154
D.G. Khan	236.006	273.408	827	430.263	772	237.704	761	237.15	3	8.2	234.15
TOTAL:	1455.541	1602.373	8177	1722.801	7715	1441.432	7321	1335.493	236	69.711	1370.328

General Issues Requiring Attention of IPD (2007-08)

The Consultants have evaluated the randomly selected M&R works taken up by the field divisions of IPD during the year 2007-08 and have compiled their findings in the evaluation reports of the corresponding divisions. During the process they have, however, come across certain issues which need to be emphasized as a special case for the attention of the Client so that appropriate corrective actions may be taken to enforce required operational and financial discipline on implementation of the schemes under the annual Work Plans. The issues are briefly described below:

- There is no standard design criteria for metalling the top of flood embankments with the result that Executive Engineers have adopted varying designs which are either inadequate or wasteful. The Department needs to prescribe standard provisions for such works which should include not only the design specifications of such works but also the locations where this facility may be utilized.
- The works of killa bushing are carried out in the department to induce berm formation on bermless channels to increase their operational safety. For this purpose to make the works most effective the timing of their execution is of critical importance. These works therefore need to be planned and implemented ahead of the months of July and August during which the canal water is heavily silt laden. The silt gets trapped in the killa bushing and berm formation takes place. In actual practice works are being generally taken up in the field without paying heed to this important aspect.
- For works of “Repairing rain cuts and gharas”, the departmental procedures require that the rain cuts and gharas be opened through labour, measured and recorded into measurement books. The opened cuts and gharas are then repaired by filling earthwork in layers and moistening and ramming to the required density. In actual practice these procedures are not adequately followed. The department needs to revive and enforce the prescribed procedures in letter and spirit.
- There is a tendency in the field divisions of IPD to split the works and keep the cost below Rs.50,000.00 so as to award it on work order basis and obviate the necessity of tendering. The department needs to take appropriate steps to curb this tendency.
- The purpose of the annual Work Plans is to organize and plan the works in advance as per prevailing necessity and priority and carry them out in a disciplined manner as per notified “Quality Assurance System”. The divisional work plans for the year 2007-08 initially approved in the beginning of the year were subjected to so many repeated revisions subsequently that the real spirit and objective of the exercise seemed to have been lost. The department needs to take steps to minimize the practice and limit it to only rare and emergent cases.

- The departmental quality assurance system require that the implementation schedules proposed for works should normally be followed and extensions in time limits be sparingly given only in cases where it is unavoidable. During the monitoring of the works it was noted that extensions in time limits of works were given too generously without cogent reasons.
- The expenditures incurred by the field divisions during different months of the year are extremely skewed, about seventy percent (70%) of the expenditure having been incurred in the last three months. This is against the spirit of good planning. The rush of work at the fag end of the year also leads to compromises on the quality of the works.
- While preparing estimates of mechanical works an arbitrary nominal credit of replaced unserviceable parts / material is given. Such material is handed over to the contractor and the credit amount is deducted from the final bill of the contractor. This is highly irregular and violation of the Codal Rules, in doing so the evidence of replaced parts / material is totally destroyed. Such material should either be taken on stock or scrap registers and auctioned as per rules.
- While preparing the estimates for rewinding of electric motors, certain percentage of wastage of burnt enameled copper wire is provided, this varies from 5% to 10% and even more in some cases. The issue has already been resolved by the Secretary IPD during 2005 through a committee. These findings have again been communicated to all the Chief Engineers by the consultants. The percentage of wastage as determined by the committee should be adopted uniformly by all concerned.

Budget Allocation and Utilization, No. of Contracts Planned, Awarded & Completed (2008-09)

Division-wise, Circle-wise and Zonal-wise information regarding budget allocation and utilization, number of contracts of M&R works awarded, completed and left incomplete during the financial year 2008-09 as provided by the Department is presented below to the following Irrigation Zones. The overall position of all the 6 Zones of IPD is presented as under:

Zone	Budget Allocation	Cost of Work Plan	Contracts Planned		Contracts Awarded		Contracts Completed		Contracts Remained In-Complete		Budget Utilized
	Amount	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount	Amount
1	2	3	4	5	6	7	8	9	10	11	12
Lahore	349.762	286.070	1175	326.601	1165	323.521	1155	318.648	12	8.002	319.022
Faisalabad	233.745	254.963	1707	237.685	1676	233.668	1663	230.278	44	4.989	228.018
Sargodha	449.267	449.018	2263	445.800	2263	446.764	2229	437.190	13	5.892	442.984
Multan	411.323	424.066	2214	440.539	2087	410.006	2063	398.011	11	3.259	402.236
Bahawalpur	362.230	424.280	1245	430.359	990	357.837	910	345.109	90	11.244	360.812
D.G. Khan	309.503	348.067	1553	325.155	1237	267.309	1299	258.108	33	32.437	300.023
TOTAL:	**2115.830**	**2186.464**	**10157**	**2206.139**	**9418**	**2039.105**	**9319**	**1987.344**	**203**	**65.823**	**2053.095**

General Issues Requiring Attention of IPD (2008-09)

The Consultants evaluated the randomly selected M&R works taken up by the field divisions of IPD during the year 2008-09 and compiled their findings division-wise to assess performance of each division. However, during the process they cam across certain issues which need to be emphasized as a special case for the attention of the Client so that appropriate corrective actions may be taken to enforce required operational and financial discipline on implementation of the works under the annual Work Plans. The issues are briefly described below:

i) The prescribed time schedule was not followed in the preparation / approval of the work plans. These were revised repeatedly. So much so that last revisions made by some of the divisions were in the month of August, after the expiry of the financial year.

ii) Information regarding works other than those approved in the work plans taken up by the Field Divisions was not provided in time to facilitate monitoring by the Consultants.

iii) Works costing below Rs 50,000/- were being allotted to the contractors at the schedule rates without recourse to calling tenders in violation of the codal rules.

iv) The implementation schedules of works stipulated in the work plans were not generally followed. Short notice tendering was adopted too frequently without cogent reasons.

v) Information regarding tendering, award of contracts, and commencement and completion of works was generally not provided the Consultants in time.

vi) For works of "Repairing rain cuts and gharas", the rain cuts and gharas are required to be opened, measured and recorded in the measurement books. The opened cuts and gharas are then repaired by filling earthwork in layers and moistening and ramming to the required density. In actual practice this strategy is not followed.

vii) Estimates of repairs to Residential Buildings costing upto Rs 3.0 lacs were sanctioned by some of the Executive Engineers in violation of their competency as laid down under Irrigation & Power Department at Sr.No.1(c) (iv) (Page 78) of "The Punjab Delegation of Financial Powers Rules, 2006.

viii) There is not standard design criteria for all weather roads to be provided on top of flood embankments with the result that Executive Engineers have adopted varying designs which are either inadequate or wasteful. The Department needs to prescribe standard design for such works which should include not only the design specifications but also the locations where this facility could be utilized.

ix) The works involving berm cutting and bed clearance of canals and drains executed done through machines were not as per approved design and grade. Moreover, the earthwork of berm cutting and bed clearance was mostly left on the berms / banks in the shape of heaps and not properly disposed off.

x) In case of Job Rates involving non-schedule items, the rate analysis are not properly prepared and sanctioned by the competent authority. The job rate quotations obtained from the local market to form the basis of estimation are not authentic unless supported by proper rate analysis duly sanctioned by the competent authority.

xi) Detailed standard specifications of metallic / non-metallic components and various lubricants are generally not mentioned while tendering which leads to the supply and use of sub-standard material.

xii) Nominal credit of the replaced components was provided in the estimates relating to repair works of machinery and the used / scrap material handed over to the contractors by deducting the credit amount from their bills in violation of the codal rules.

xiii) Monthly expenditure statements of works are not being supplied to the Consultants by the divisions for monitoring the financial progress.

xiv) The utilization of the budget allocations by the Divisions during the year was extremely skewed. About 50% to 60% of the expenditure was incurred in the months of May and June. This is against the spirit of good planning. The rush of work at the fag end of year also leads to compromises on the quality of works.

xv) A number of works tendered and awarded during the month of June could not be completed in time and have been carried over to the next financial year 2009-10.

xvi) Urgent need for ownership of implementation of M&R Work Plans by Superintending Engineer's and Chief Engineers.

Appendix–6

IRRIGATION MEGA PROJECTS DEVELOPMENT – A CASE STUDY OF TAUNSA BARRAGE EMERGENCY REHABILITATION AND UP-GRADATION PROJECT

IRRIGATION MEGA PROJECTS DEVELOPMENT – A CASE STUDY OF TAUNSA BARRAGE EMERGENCY REHABILITATION & UP-GRADATION PROJECT

Taunsa Barrage built across Indus River is located at about 16 Km from Kot Adu, a Tehsil head quarter of Muzaffargarh District, with location coordinates of 30º 31' N 70º 51' E. The Barrage as originally constructed has 65 bays with a total width of 4,346 ft between the abutments. Width of each bay is 60 ft except for bay No. 8 which is 22 ft wide and serves as navigation lock to allow boats and other craft to cross the Barrage. Bays No. 9 to 61 constitute main weir and there are two sets of undersluices separated from the weir by two divide walls as left and right flanks bays No. 1 to 7 from left undersluices while right undersluices cover bays No. 62 to 65. The Barrage has 2 fish ladders each 11 ft wide alongside each divide wall.



Downstream View of the Barrage

Discharge, GCA & Districts Irrigated by Taunsa Barrage Canals

Sr #	Name of Canals	GCA (Acres)	Length (Km)	District	Design Discharge (Cusec)
1	Muzaffargarh	940,000	113	Muzaffargarh, Layyah	8,901
2	DG Khan	1,285,000 (present) 2,279,874 (Final)	105	DG Khan, Rajanpur	i) present day 11,540, Final 14,500
3	TP Link	126,000 (Rangpur canal tail area) supplemental support to Panjnad Command	62	Muzaffargarh, Balawalpur, Rahimyar Khan	12,000

FUNCTIONS OF THE BARRAGE

The functions of a conventional Barrage are:

- Raising water level in the river to an extent required for feeding the off-taking canals;
- Pinning down the river at one location to facilitate transportation needs;
- Regulation and control of the river flows.

But Taunsa Barrage is more than a conventional Barrage. It provides the following:

- Irrigation facilities to areas in Muzaffargarh, DG Khan and Rajanpur Districts (2.354 million Acres);

- Converting inundation canal systems into weir regulated irrigation system;
- Accommodates rail road crossing for the direct rail link between Kot Adu on the left bank and DG Khan, Rajanpur and Kashmore on the right bank of Indus River in Sindh;
- Accommodates a Class 70/AA loading Arterial Road Bridge;
- Accommodates a 16 inch dia high pressure pipeline owned by PARCO for conveying petroleum products from Karachi to the up country storage at Mahmood Kot terminal.
- Accommodates a 16 inch dia high pressure natural gas pipeline conveying natural gas from Dhodak gas field to KAPCO and serviceable areas.

Taunsa Barrage is thus a truly multipurpose complex.

Problems and Remedial Measures

Taunsa Barrage soon after its commissioning in 1958 ran into multitude of problems, which multiplied with passage of time. Then, a stage reached that indicated that the Barrage could collapse at any time, This, God forbid, would have resulted in; stoppage of irrigation water supply to multi-millions of acres and drinking water supply to about 6 million people and their live stock served by Taunsa Barrage canals' systems; disruption of rail road traffic to trans-Indus areas; non functioning of oil and gas pipe lines crossing the river over the Barrage piers; etc.
Briefly, solutions to the problems lay in immediate rehabilitation of Taunsa Barrage to restore its designed functions. The following table lists the problems and proposed solutions/remedies in annotated form.

Problems and Solutions/Remedies

Problems	Solution / Remedies
Retrogression of levels on the downstream of Barrage and consequential issues	Construction of a subsidiary weir 925 ft downstream of the Barrage to raise tail water levels to safe values.
Repeated damages to stilling basin appurtenances including rupture of skin concrete and leaking joints of mass concrete.	Grouting of leaking Concrete and cavities in or underneath the mass concrete, removal of existing shattered skin and re-laying of 3 feet thick concrete overlay with nominal reinforcement.
Sedimentation problems in DG Khan canal	Construction of silt excluder in the u/s right pocket, raising crest of head regulator and removing the silt ejector at RD 20,800 D.G Khan Canal which is not rendering any assistance in silt ejection rather behaving as a hump in the canal flow.
Repeated subsidence of the backfill of left and right flared out walls on the downstream.	Provision of a proper filter and pressure release pipes or an effective seepage cut-off.
Choking of about 80% of pressure pipes and mal-functioning of the remaining 20%	Provision of vibrating wire (electronic) piezometers in 10 bays of the Barrage and 7 rows in the new sub-weir.
Problems of gates and hoists	Overhauling the gates and hoisting system, improvements through amended design and automation with Central Control System for better regulation of flows.

PROJECT OBJECTIVES AND CONSTRUCTION PHASE

The main objectives of the Project were to take urgent steps to prevent a failure of the Taunsa Barrage that provides irrigation for two million acres and drinking water in the rural areas of Southern Punjab

benefiting several million farmers, and to serve as a model for rehabilitation of other Barrages in Punjab.

In May 2005, the World Bank helped launch the "Taunsa Barrage Emergency Rehabilitation and Modernization Project" to achieve the aforesaid objectives and to assist Irrigation and Power Department, Government of the Punjab in overcoming the problems associated with the Taunsa Barrage.

Engineering Design

The following table lists the design standards adopted for engineering design of various Project works

Basis of Design for Various Components Works

Sr #	Design Features	Theory / Standard Adopted
1	Frequency Analysis for Estimation of the Peak Annual Discharge	Gumbel Extreme Value Type-I
2	Surface Flow Conditions – Hydraulic jump analysis and relevant floor thickness	Crump and Khosla methods
3	Subsurface Flow Analysis • Safety against Uplift Pressures • Seepage Analysis • Floor Thicknesses	 Khosla' s Theory, Lane Theory Khosla' s Theory, & Lane Theory Khosla' s Theory
4	Stilling Basins • Type	USBR Engineering Monograph No. 25 Modified Type IV
5	Stone Aprons	Scour depths using Lacey's Method and the Blench Equation
6	Abutment & Flared out Walls	USBR Monograph No. 27 & Irrigation Engineering by SK Sharma
7	Earth Pressure for Stability Analysis for walls and embankments	Coulomb's Theory
8	Structural Design	American Concrete Institute (ACI), or British Standards (BS) where ACI Code does not carry certain pertinent information.

PROCUREMENT OF CONSULTANCY SERVICES AND WORKS

Procurement of Services of Supervision Consultants

M/s Punjab Barrages Consultants-PBC (a Joint Venture of National Development Consultants Regd (NDC), and National Engineering Services of Pakistan (Pvt) Limited (NESPAK) in association with ATKINS (Global) Water, UK), who had provided services for feasibility study and detailed design of Taunsa Barrage, were employed to provide construction supervision services for following two International Competitive Bidding (ICB) Contracts financed by the World Bank:

i) Civil Works - ICB-01 Contract
ii) Mechanical & Electrical Works - ICB-02 Contract

Procurement of Civil Works

The procurement for civil works was initiated in July 2004 with a notice for Invitation for Prequalification in the press. In response to the above notice, eleven individual firms and joint ventures (JV), from different countries applied for prequalification.

After evaluation, five applicants qualified for bidding for civil works and these were notified during September 2005. The Letters of Invitation (LOI) to purchase Bidding Documents for ICB-01 Contract were issued to the pre-qualified firms/JVs on November 13, 2004. Out of 5 pre-qualified bidders, 4 submitted their Bids The Bids were opened on January 14, 2005 at 11:30 hours by a Bid Opening Committee in the presence of Bidder's Representatives.

As a result of bid evaluation process, carried out by the bid evaluation committee, JV of M/S Descon Engineering Ltd (DEL) and M/S China Gezhouba Water & Power Group Corporation Ltd (CGGC), was declared as the lowest evaluated Bidder.

Letter of acceptance for ICB Contract-01 (Civil Works) was issued to JV of DEL-CGGC by Head PMO for Punjab Barrages (Employer) on 12 April 2005. Notice to commence the work was issued by the Engineer on 10 May 2005 and Contract amounting to Rs 4,527.68 million was signed on 27 May 2005 with a stipulated completion period of 1,092 days with May 05, 2008 as the Contracted date of completion.

Procurement of M&E Works

The procurement process for M & E works was initiated in April 2005 with publication of a notice for Invitation for Prequalification in the press. In response to the above notice, eight firms/JVs from different countries applied for prequalification.

Out of eight applicants six firms/JVs were pre-qualified. The results of pre-qualification were issued on November 01, 2005 to all the six pre-qualified firms/JVs.

The LOI to purchase Bidding Documents for ICB Contract No. 02 was issued to all pre-qualified firms/JVs on November 23, 2005. Only 4 firms/JVs purchased the Bidding Documents.

The Bids were opened on January 09, 2006 at 11:30 hours by a Bid Opening Committee in the presence of Bidder's Representatives. As a result of bid evaluation process, approved by World Bank JV of M/S China National Electric Wire & Cable Imp./Exp. Corporation (CNEWC), China was declared as the commercially lowest evaluated Bidder.

Letter of acceptance for ICB Contract-02 was issued to M/S CNEWC, China by Head PMO for Punjab Barrages on August 11, 2006. Notice to commence the work was issued by the Engineer on August 29, 2006 and the Contract was signed on October 09, 2006. Total price of the Contract was Rs 1,557.76 million with a completion period of 850 days with a prescribed date of 26 December, 2008..

CONSTRUCTION OF THE PROJECT WORKS

Civil works

Civil Works Contract ICB-01

The Contract (ICB-01) Civil works in the river bed were completed one year ahead of schedule. Taking Over Certificate (TOC) was issued 26 May 2008.

Scope of Work

Civil works involved following main components:

a) Mobilization Works, involving construction of Contractor's and Employer's site Facilities such as Contractor's labor camp and staff residences, equipment and plants maintenance facilities etc.

b) Strengthening of the existing Barrage included;

- Rehabilitation of D/S floor & glacis of Main Weir,
- Construction of silt excluder for DG Khan Canal
- Remodeling of D.G. Khan Canal Head Regulator
- Remodeling of Fish ladders of Existing Barrage
- Diversion of escape channel of D.G. Khan Canal silt ejectors

c) Construction of 4,346 ft long Subsidiary Weir with essential appurtenances such as navigation lock, two fish ladders and the D/S guide banks.

MECHANICAL AND ELECTRICAL (m & e) WORKS

M&E Works Contract ICB-02

ICB-02 Contract comprising M & E works was awarded to M/S China National Electric Wire & Cable Import/Export Corporation (CNEWC); the acceptance letter was issued on August 12, 2006; 'Notice to Commence' was issued on 29 August 2006 and Contract was signed on 09 October 2006. The original Contract Price was Rs 1,557.76 million (excluding provisional sums). The stipulated Contract period was 28 months with completion date of 26 December 2008. Taking Over Certificate (TOC) was issued on 09 February 2009.

SCOPE OF WORKS

M&E works under ICB-02 contract for Taunsa Barrage Emergency Rehabilitation and Modernization Project financed by the World Bank comprised:

a) Mobilization Works
b) Replacement of 4 right undesluice gates No. 62-65.
c) Rehabilitation of 31 gates of the main weir, (bay No. 31-61) and Gate No. 8 in the navigation bay.
d) Replacement of 7 gates each of DG Khan and T.P. Link Canal Head Regulators
e) Rehabilitation of 5 gates of Muzaffargarh Canal.
f) Automation of gates operation
g) Data acquisition and communication system.
h) Procurement of necessary equipment for operation and maintenance, including workshop, data observation, and discharge monitoring equipment,

QUALITY ASSURANCE AND QUALITY CONTROL

General

Quality assurance and quality control are the most important grass root processes that are essential for good health and timely completion of large construction project. Taunsa Barrage Emergency Rehabilitation and Modernization Project was a mega project and proper implementation of QA and QC procedures was the essence of the whole construction operation for the project.

Engineers Quality Assurance Plan

A quality assurance and control plan was prepared by the Engineer and submitted to the Employer vide # TBRM/01/82.2/61 dated June 20, 2005. It included the details of quality assurance procedures and instructions.

CONTRACTOR'S quality assurance plan

The Contractor also prepared and submitted his plan as per Contract Provision (SP-10) which being in order was reviewed and agreed.

Source Approvals

The first step in the quality assurance/control (QA/QC) activities exercised on the project is the source approval of the materials intended to be used on the project by the Contractor. Source approvals were granted for required materials including steel reinforcement, aggregates, stone, cement, PVC water stops, and admixtures etc. After the source approval, regular tests were conducted in the laboratory established at the site for aggregates, concrete, bricks. For materials such as cement, steel reinforcement, samples were taken periodically from the consignments delivered at site in accordance with provision of the technical specifications of the project. These materials were got tested from Central Materials Testing Laboratory (CMTL) WAPDA, University of Engineering & Technology, Lahore, and PITAC, Lahore.

CONCRETE MIX DESIGN

The method given in ACI 211.1-91 was adopted to design the mix for Concrete class A, B, C, D & E. 28 days strength requirement for the above five categories of Concrete was:

Class A 4000 Psi	Class B 3000 Psi
Class C 2500 Psi	Class D 2000 Psi
Class E 1500 Psi	

SOCIAL & ENVIRONMENTAL ASPECTS

Summary

Water resources development projects invariably result in many far-reaching ecological changes. Some of them benefit human population, while others threaten the long-term productivity of the projects themselves as well as the natural resource base. The undesirable changes are not solely restricted to increasing pollution or loss of habitat for native plants and animals; they cover the entire range of environmental components, such as soil, water, air, energy, and the socioeconomic system.

The Taunsa barrage emergency rehabilitation and modernization (TBERM) project was necessitated due to retrogression of levels on the downstream of barrage and consequential issues; i.e., repeated damages to stilling basin appurtenances including rupture of skin concrete and leaking joints of mass concrete; sedimentation problems in DG Khan canal; choking of about 80% of pressure pipes and mal-functioning of the remaining 20%; and above all, operational problems of gates and hoists.

To comply with Pakistan as well as international financer's social and environmental safeguards policies, environmental impact assessment was carried out to predict social and environmental impacts of the project during construction as well as operation phases. The environmental management and monitoring plan (EMMP) as well as a resettlement action plan (RAP) were also developed to mitigate the anticipated adverse social and environmental impacts.

The environmental and social impacts anticipated and identified during monitoring were:

- Biological Impacts: Impacts on Taunsa wildlife sanctuary; threats to Indus dolphin upstream or downstream; Impacts on algae and micro-invertebrates; impacts on fish fauna.
- Physical Impacts: change in river morphology; waterlogging; impacts on water quality; changes in ambient air quality; increased noise levels.
- Social Impacts: Community displacement and resettlement; pending claims/grievances of project affected persons (PAPs); disturbance in fishing; disturbance in business; economic stability to canal command area; social mixing; downstream fish catch.

All these issues were well addressed during construction phase. The most significant positive impact of TBERM project is the sustainability of the agriculture ecosystem in the canal command areas which otherwise could result in desertification of the entire land, in case of failure of the barrage.

PHYSICAL QUANTITIES AND FINANCIAL TABLES

- All the project works were completed within schedule time and cost.
- The total project cost has remained within the approved PC-1 outlay.
- The table showing the breakup appears as Table-I.
- The project has been constructed/completed under two International Contracts. The physical quantities completed for ICB-01 are contained in Table-II.
- The expenditure on ICB-01 works comes to Rs. 4,974,084,181/- as detailed in Table-III.
- All the works have been completed by ICB-02 Contractor in December 2008.
- The total expenditure on ICB-02 is Rs. 1,877,403,517/- as detailed in Table-IV.
- Since the expenditure is within the approved cost, the economic studies will not yield any significant change in the EIRR calculated earlier.

LESSONS LEARNT

Lesson Learnt

Based on detailed discussions with the government project team and consultants on the lessons learnt from the Project, the following inferences can be drawn for preparation and implementation of similar projects:

Project Design and Preparation:

- Project Design should include a component of social and environmental management along with mitigation/support measures.
- Adequate orientation / training for PMO and consultants staff on the World Bank safeguards policies is very important.
- A Communication Strategy and Program about canal closure should be part of the project preparation to ensure a smooth implementation of the Project.
- A PMO fully staffed with competent specialists in all aspects/needs should be on board by project approval and a mechanism should be in place to avoid frequent staff turnover.
- Key Borrower actions such as approval of PC-I, EIA, and convening of POE for review of feasibility study and engineering design should be completed before Bank's approval.
- The procurement process for key works, goods and consultants services required during the first year of the project should be at an advanced stage by project negotiations, so that disbursements commence immediately after effectiveness of loan agreement. Likewise, issues

such as processing and decision making about project procurements should be streamlined to avoid unnecessary delays.

- Constructability of engineering design should be reviewed thoroughly in design phase for execution of the contract in accordance with schedule.
- An orientation/training for familiarizing the PMO staff and supervision consultants about World Bank procurement guidelines and safeguard policy at project launch would help improve project implementation.

Project Implementation

- A high-level Project Steering Committee (PSC) and effective coordination mechanism in the government prove to be a main success factor in resolving key issues in a timely manner.
- A Project Implementation Plan (PIP) prepared during project preparation would be a very valuable guide for all project staff to avoid ad hoc planning;
- A well-thought out planning process is important for proactive environmental and social management;
- Procurement for consultancy services and works should be done in time to avoid missing critical working periods such as annual canal closure/low flow period.
- Supervision Consultants should be properly staffed with contract management, and Environment, Health and Safety (EHS) staff at site.
- Contractor's relations with local community are important for smooth implementation.
- International Panel of Experts (POE) is an effective way of independent review and quality enhancement.
- Level of commitment and competency of Implementing Agency management and PMO core staff are critical to project success.
- There should be certain mechanism built-in the contract document to ensure that the construction contractor fully complies with EMMP of the Project.
- Implementation of resettlement action plan (RAP) and other project activities involving interaction with local communities should be implemented through the process of social mobilization. Involvements of rural support networks such NRSP, PRSP can provide valuable assistance. Implementing Agency (IA) role in such a case shall of a monitoring the progress.

Financial Management

- It is essential that anomalies arising due to application of the Government procedures versus financing agency's procurement guidelines needs to be clearly defined.
- It is necessary that Provincial Government including the Finance and the Audit Department understand the procedure and discipline intended for implementation of the project, subsequent audit observations discourage the pace of the project.
- A sound financial management, accounting and reporting system managed by qualified staff is a key element for a smooth implementation of the project. Considerations should be given to out-sourcing certain aspects of financial management to professional firms, instead of setting up in-house system.

Project Cost Summary -Component Wise

Sr. No.	Description	Approved PC- I
A	Civil Works (ICB-01 Contract)	4,974.08
B	Mechanical and Electrical (M&E) Works	
B-1	JICA Grant-in-Aid	2,778.84
B-2	Recipient Country's Share	113.00
B-3	ICB-02 Contract (World Bank Funding)	2,077.40
	Sub - Total B, (B1+B2+B3)	4,969.24
C	Project Management Support and Technical Assistance	402.37
	Total Base Costs (A+B+C)	***10,345.69***
D	Physical Contigencies @3% on Civil and E & M Works	186.98
E	Escalation @ 10% on Local and 10% on Foreign Currency Base Cost	
F	Taxes and Duties etc @ 12.5% of Foreign Exchange Component	
G	Interest During Constrcution	207.00
H	Front End Fee for World Bank Loan (As per loan Aggrement, 1% of the loan amount)	32.98
Total Project Costs		**10,772.65**

ICB-01 CONTRACT
Overall Physical Progress Summary

Sr No	Item	Units	BOQ Provision	Total Workdone
1	Earthwork Excavation	Cft	20,114,222	20,063,577
2	Embankment	Cft	8,452,500	9,293,468
3	Dismantling of Existing Stone Pitching	Cft	71,950	292,141
4	Steel Sheet Piles	Sft	384,692	421,128
5	Concrete Class A	Cft	5,967,100	7,156,984
6	Concrete Class B	Cft	2,288,800	2,438,115
7	Concrete Class D	Cft	254,397	456,144
8	Concrete Class E	Cft	786,100	547,103
9	Steel Reinforcement	Ton	5,604	6,666
10	Dismantling of Concrete	Cft	1,259,260	820,482
11	Drilling and Grouting	Inches	164,124	173,121
12	Vibrating Wire Piezometers	No.	120	119
13	Stand Pipe Piezometers	No.	14	11

14	Stone Apron	Cft	4,175,700	5,136,238
15	Filter Material	Cft	539,900	589,661
16	PVC Water Stop Type A	L Ft.	9,348	85,539
17	PVC Water Stop Type B	L Ft.	140,090	7,619
18	Rawl Bolts	No.	14,295	8,762
19	Gate Equipment for Navigation Lock Bay	Set	1	1
20	Stop logs for Gate of Navigation Lock Bay	Set	1	1
21	Slide Gate Equipment for Fish Ladders	Set	1	1

CONTRACT NO. ICB-01 (CIVIL WORKS)

SUMMARY

Consultants: Punjab Barrages Consultants **Contractor:** DESCON-CGGC JV

Sr. No.	Description	BOQ Amount	Total Work Executed (Pak Rupees)	Remarks
A	B	C	D	E
1	General Items (Less Prov. Sum and Prime costs)	995,404,653	938,065,057	
2	Subsidiary Weir	2,587,148,910	2,744,532,481	
3	Guide Banks	159,836,691	119,063,236	
4	Repair works for existing barrage	611,496,498	397,066,016	
5	Silt excluder in U/S right pocket	36,289,782	37,825,160	
6	Excavation of diversion channel	3,864,000	2,183,652	
7	Remodeling of DG Khan Canal Head Regulator	19,169,847	5,539,588	
8	Remodeling of Fish Ladders Existing Barrage	25,954,505	17,259,711	
9	Gate Equipment for Subsidiary Weir	60,869,303	24,311,902	
Sub Total for BOQ Bill 1 to 9		**4,500,034,189**	**4,285,846,804**	
10	Variation Orders	-	421,421,293	
11	Provisional Sum/Prime Cost Items	18,700,000	2,219,626	
12	Daywork Orders	14,952,125	148,816	
13	Discount Deducted	(356,000,000)	(347,870,190)	

14	Price Adjustment under Clause 70.3	350,000,000	481,502,567	Price adjustment is applicable to local currency component only.
15	Repayment of Advance (15% Sr. No.16) Clause 60.7			Advance already recovered.
16	Other sums due under the Contract (Clause 60.1) DRB Expenses		5,815,265	
17	Amicable settlement		125,000,000	
18	**Total / Net Amount Payable**	**4,527,686,314**	**4,974,084,181**	

CONTRACT NO. ICB-02 (MECHANICAL & ELECTRICAL WORKS)

SUMMARY

Consultants: Punjab Barrages Consultants
Contractor: China National Electric Wire and Cable Imp/Exp Corporation

Sr. No. / BOQ Bill No.	Description	BOQ Amount	Amount of BOQ excluding bid discount (1%)	Total Workdone (PKR)
				BOQ Items
A	B	C	D	F
1	General Items (Less Prov. Sum)	172,821,655	171,093,438	159,441,318
2	Rehabilitation Works of Underslucies Gates (Less Prov. Sum)	133,708,739	132,371,652	133,708,740
3	Rehabilitation Works of Weir Gates (Less Prov. Sum)	641,183,997	634,772,157	622,196,775
4	Rehabiltation Works of Canals Head Regulator Gates (Less Prov. Sum)	69,996,985	69,297,015	48,292,756
5	Modernization of Hoisting Mechanism and Installation of Discharge Monitoring and Communicaton System	134,535,899	133,190,540	121,647,083
6	Electro-Mechnical Works of Lock Gates	18,874,214	18,685,472	18,874,214
7	Electro-Mechanical Works of 11 Left & 4 Right Undersluice Gates)	62,273,414	61,650,680	57,921,893
8	Rehabiltation Works of Canals Head Regulator Gates	170,429,053	168,724,762	164,247,732
9	Installation of water Discharge Data Acquisition System /Modernization of existing Gates Hoist Mechanism.	15,380,928	15,227,119	14,682,138
10	Spare parts Tests & Mechansim	15,318,663	15,165,476	15,318,663

11	Discharge Monitoring and Communication Network	69,454,050	68,759,510	69,454,050
12	Work Shop Equipment	18,436,565	18,252,199	18,436,565
13	Equipment/Instrument Required for Survey, GIS Related Hardware, Software and date Observation.	36,395,644	36,031,688	29,587,573
14	Central Operation Control Room	10,928,006	10,818,726	10,928,006
Total Amount 9Bill No. 1 to 14)		**1,569,737,812**	**1,554,040,434**	**1,484,737,506**
15	**Discount**			**(14,847,375)**
16	Variation Orders		-	235,312,032
17	Provisional Sum/Prime Cost Items	58,100,000	58,100,000	
18	Daywork Orders	3,258,995	3,258,995	-
19	Amount subject to Price Adjustment			
20	Price Adjustment under Clause 70	100,000,000	100,000,000	172,201,355
21	**Total Amount due prior to deductions**			1,877,403,517
22	Withholding Tax @ 6%			
23	Total Amount after deduction			
24	**Total Amount due after deductions (Sr. No. 20-21)**	**1,731,096,807**	**1,715,399,429**	**1,877,403,517**

Note: 1 US $ = Rs 59.90
US $ 20,372,492

Appendix–7

KEY PERFORMANCE INDICATORS

PUNJAB IRRIGATION AND POWER DEPARTMENT
Key Performance Indicators

#	Sub Activity	KPI
CHIEF ENGINEER (Operational Zone)		
1	Development and Rehabilitation Works in the Zone	• Identification of ADP, Rehabilitation & Improvement and Remodelling Schemes and Preparation of ADP on scheduled time; • Project Preparations as per Program; • Project Implementation in the given time frame.
2	Monitoring Operation & Maintenance of canals	• Inspection of canals and other works by the Superintending Engineers, Executive Engineers and subordinate staff as per Departmental guidelines; • Preparation and approval of annual M&R work plans by SEs by schedule date; • Implementation of the approved work plans in the given time frame as per Quality Assurance System of the Department.
3	Regulation of canal supplies and equitable distribution within the system;	• Discharge observations of canals and outlets in the zone. • Periodical check of the outlets. • Preparation and maintenance of H Registers and outlet efficiency diagrams. • Maintenance of gauge registers and record of tail gauges. (PMIU may look into these indicators)
4	Performance of the Revenue Staff in the zone	(List of indicators may be got framed from a senior Canal Collector).
5	Concurrent control with the Audit Officer, over the duties of the officers of the department in connection with the maintenance of the accounts.	• Maintenance of Accounts by the lower officers & timely submission of periodical accounts returns. • Budget allotments of the year are fully expended and large expenditures in the last month of the year are prevented; • Money which is not likely to be needed during the year is promptly surrendered; • Disposal of audit observations and draft paras.
6	Maintaining Performance Efficiency and Discipline in the Zone.	• Disposal of disciplinary cases; • ACRS by all concerned in the zone as per prescribed time schedule; • Postings and transfers in the zone as per Govt. Policy ; and • Filling of vacant posts.

#	Sub Activity	KPI
7	Miscellaneous Activities	• Annual Inspections of the lower offices; • Systematic touring by the field Officers. • Decision making on issues referred by the lower offices; • Liaison & coordination with other Departments. • Interaction with public and public representatives and • Disposal of public complaints.
SUPERINTENDING ENGINEER (Operation Circle)		
1	Development and Rehabilitation Works in the Circle	• Identification of ADP, Rehabilitation & Improvement and Remodelling Schemes and Preparation of ADP on scheduled time; • Project Preparations as per Program; • Project Implementation in the given time frame.
2	Monitoring Operation & Maintenance of canals	• Inspection of the state of various canals and works in the circle and to satisfy himself that the system of management prevailing is efficient and economical. • Preparation and approval of annual M&R work plans by schedule date; • Implementation of the approved work plans in the given time frame as per Quality Assurance System of the Department.
3	Regulation of canal supplies and equitable distribution within the system;	• Discharge observations of canals and outlets in the Circle. • Periodical check of the outlets. • Preparation and maintenance of H Registers and outlet efficiency diagrams. • Maintenance of gauge registers and record of tail gauges. (PMIU may look into these indicators)
4	Adjudication of cases under Canal and Drainage Act and judicious disposal of other revenue cases	
5	Performance of the Revenue Staff in the Circle	(List of indicators may be got framed from a senior Canal Collector).
6	Maintenance of accounts in the Circle and lower offices as per codal procedures.	• Monitoring budget preparation and timely submission of periodical returns. • Budget allocation and utilization in the circle; • Inspection of divisional offices in the circle at least once in a year to examine various accounts documents. • Examination of books of the divisional offices and their subordinates to see that accounts fairly represent the progress of each work.

#	Sub Activity	KPI
		• Examine the register of works so as to keep a vigilant watch over the rates of works. • Investigate excesses over subheads to decide whether a revised estimate is required for the work. • No delay is allowed to occur in the submission of completion reports where necessary. • Disposal of audit observations and draft paras.
7	Maintaining Performance Efficiency and Discipline in the Circle.	• Disposal of disciplinary cases; • ACRS by all concerned in the Circle as per prescribed time schedule; • Postings and transfers in the Circle as per Govt. Policy ; and • Filling of vacant posts.
8	Miscellaneous Activities	• Systematic touring by the field Officers as per Departmental instructions. • Decision making on issues referred by lower offices regarding administrative, technical, financial and revenue matters; • Liaison & coordination with other Departments. • Interaction with public and public representatives and • Disposal of public complaints.
1	Development and Rehabilitation Works in the Division	• Identification of ADP, Rehabilitation & Improvement and Remodelling Schemes and Preparation of ADP on scheduled time; • Project Preparations as per Program; • Project Implementation in the given time frame.
2	Operation & Maintenance of canals	• Inspection of channels by himself and the subordinate staff as per Dept. guidelines; • Preparation of annual M&R work plan by schedule date; • Implementation of the approved work plan in the given time frame in accordance with the Quality Assurance System of the Department; • Checking the preliminary survey of under water works up to the prescribed limit; • Check measuring the underwater works up to prescribed limits.
3	Regulation of canal supplies and equitable distribution in the Division.	• Periodical check of the discharge of Channels and outlets; • Periodical Physical check of the outlets; • Preparation and maintenance of H Registers and outlet efficiency diagrams. • Maintenance of gauge registers and record of tail gauges. (List of indicators to be given by PMIU)
4	Adjudication of cases under Canal and Drainage Act and judicious disposal of	

#	Sub Activity	KPI
	other revenue cases	
5	Performance of the Revenue Staff in the Division.	(List of indicators may be got framed from a Revenue Officer).
6	Maintenance of Divisional accounts as per codal procedures.	• Maintenance and upkeep of departmental stores of Stock & T&P articles including Survey and mathematical instruments by Ensuring; - Periodical physical checks; - Correctness of records of cash and stores, receipts and expenditures; - Preparation and submission of monthly accounts of the division to the Audit Office. • Budget preparation and timely submission of periodical returns. • Budget utilization in the Division as per allocation; • Inspection of sub-divisional offices in the division at least once in a year to examine various accounts documents. • Revision of estimates to cater for excesses / surrenders over subheads of works. • Provide immediate information of the probability of excess to the SE. • Submission of completion reports in time, where necessary. • Disposal of audit observations and draft paras.
7	Maintaining Performance Efficiency and Discipline in the Division	• Disposal of disciplinary cases; • ACRS by all concerned in the zone as per prescribed time schedule; • Postings and transfers in the Division as per Govt. Policy; and • Filling of vacant posts.
8	Miscellaneous Activities	• Measures to preserve all the buildings and works in the division. • Preventing encroachments on Government land. • Ensuring safe guard and preventing accidents to all canal and drainage works in the division. • Decision making on issues referred by lower offices regarding administrative, technical, financial and revenue matters; • Liaison & coordination with other Departments. • Interaction with public and public representatives and • Disposal of public complaints.
SUB DIVISIONAL OFFICER (Operation Sub-Division)		
1	Development and Rehabilitation Works in the Sub-Division	• Assisting in identification of ADP, Rehabilitation & Improvement and Remodelling Schemes and Preparation of ADP Program in scheduled time; • Project Preparations as per approved Program;

#	Sub Activity	KPI
		• Project Implementation as per given time frame.
2	Operation & Maintenance of canals in the Sub Division	• Inspection of channels by himself and the subordinate staff as per Dept. guidelines; • Assist in preparation of annual M&R work plan of the Division by the scheduled date; • Implementation of the M&R works in the Sub-Division as per plan in accordance with the Dept. Quality Assurance System; • Checking the preliminary survey of works up to the prescribed limit; • Check measuring the works up to prescribed limits.
3	Regulation of canal supplies and equitable distribution in the Sub Division.	• Checking discharge of Channels and outlets periodically as per Dept. Orders; • Reporting to police any damage/alteration done to outlets/ canal structure; • Periodical Physical check of the outlets; • Preparing and maintaining H Registers and outlet efficiency diagrams and • Maintaining gauge register and record of tail gauges. (List of indicators to be given by PMIU)
4	Adjudication of cases under Canal and Drainage Act and judicious disposal of other revenue cases	
5	Maintenance of Sub Divisional accounts as per codal procedures.	• Maintain and upkeep of departmental stores of Stock & T&P articles including Survey and mathematical instruments by: - Carrying out physical checks periodically. - Ensuring the correctness of records of cash and stores, receipts and expenditures; - Preparation and submission of monthly accounts of the Sub-division to the Divisional Office. • Assisting Divisional office in budget preparation and timely submission of periodical returns. • Budget utilization in the Sub-Division; • Keeping a watch over excesses/ surrenders over subheads of works and prepare revised estimate if required; • Preparation and submission of completion reports where necessary. • Assist Divisional office in Disposal of audit observations and draft paras.
6	Miscellaneous Activities	• Maintaining performance efficiency and discipline in the Sub-Division; • Taking measures to preserve all the buildings and works in the Sub-division. • Preventing encroachments on Government land. • Ensuring safe guard and preventing accidents to all canal and drainage works in the Sub-division.

#	Sub Activity	KPI
		• Interaction with public; • Disposal of public complaints.
SUB ENGINEER (Operation Section)		
1	Development and Rehabilitation Works in the Section	• Assist SDO in identification of ADP, Rehabilitation & Improvement and Remodelling Schemes and Preparation of ADP Program in scheduled time; • Assist SDO in Project Preparations as per approved Program; • Project Implementation as per given time frame.
2	Operation & Maintenance of canals in the Section	• Inspection of channels as per Dept. guidelines; • Assist in preparation of annual M&R work plan of the Division by the scheduled date; • Implementation of the M&R works in the Section as per plan in accordance with the Dept. Quality Assurance System; • Carrying out preliminary survey and prepare estimate of M&R, Development, Remodelling schemes as per given time schedule; • Supervise execution of works and take measurements thereof in the measurement books and prepare Contractor's bills; • Put up measurement books regularly to his SDO at least twice a month; • Submission of various periodical returns due from him as per specified time schedules; • Ensure efficient performance and discipline in the subordinate Staff.
3	Regulation of canal supplies and equitable distribution in the Section.	• Check the discharge of Channels and outlets including tail outlets; • Safe guard and prevent accidents to all canal and drainage works within his section; • Report any damage/alteration done to outlets/ canal structures; • Maintain Outlet notebooks and physically check all the outlets during a month; • Prepare command statements in revenue cases u/s 20 and 68; • Prepare and maintain H Registers and outlet efficiency diagrams; • Maintain gauge register and record of tail gauges.
4	Maintenance of accounts in the Section as per codal procedures.	• Maintain and upkeep of departmental stores of Stock & T&P articles including Survey and mathematical instruments by; - Carrying out periodical physical checks. - Maintaining accounts of Issue and receipts of store articles. - Preparation and submission of monthly accounts of Issues and receipts of store articles. • Provide assistance for Disposal of audit observations and paras.

CHIEF ENGINEERS
(Operational Zones)

Technical (Weightage 50)

1. Overview and monitoring Development and Rehabilitation Works in the Zone (15)
    - Identification of ADP, Rehabilitation & Improvement and Remodelling Schemes and Preparation of ADP Program on scheduled time;(5)
    - Project Preparations as per approved Program; (5)
    - Project Implementation in the given time frame. (5)
2. Overview and monitoring Operation & Maintenance of canals (20)
    - Inspection of channels by the Superintending Engineers and Executive Engineers and subordinate staff as per Dept. guidelines;(5)
    - Preparation and approval of annual M&R work plans by SEs by schedule date ;(5)
    - Implementation of the approved work plans in the given time frame;(5)
    - Execution of works as per Quality Assurance System of the Department. (5)
3. Overview and monitoring regulation of canal supplies and its equitable distribution within the system; (10)
   (List of indicators to be given by PMIU)
4. Overview and monitoring performance of the Revenue Staff in the zone.(5)

   (List of indicators may be got framed from a senior Canal Collector)

Financial (20 marks)

1. Overview and monitoring efficient maintenance of accounts in the lower offices as per codal procedures to ensure financial discipline; (4)
2. Monitoring that the budget allotments of the year are fully expended and large expenditure in the last months of the year is prevented; (4)
3. Ensuring that any money which is not likely to be needed during the year is promptly surrendered; (4)
4. Exercise a concurrent control with the Audit Officer, over the duties of the officers of the department in connection with the maintenance of the accounts(4) and
5. Monitoring disposal of audit observations and draft paras. (4)

Administrative (20 marks)

1. Overview and monitoring general performance efficiency and discipline in the zone; (4)
2. Disposal of disciplinary cases; (4)
3. ACRS by all concerned in the zone as per prescribed time schedule; (4)
4. Postings and transfers in the zone as per Govt. Policy (4); and
5. Filling of vacant posts. (4)

General (20)

1. Overview and monitoring general performance efficiency and discipline in the zone;
2. Annual Inspections of the lower offices;
3. Postings and transfers in the zone as per Govt. policy.
4. ACRS by all concerned in the zone as per prescribed time schedule
5. Disposal of disciplinary cases;
6. Systematic touring by the field Officers.
7. Decision making on issues referred including administrative, technical, financial and revenue matters;
8. Liaison & coordination with other Departments.
9. Interaction with public and public representatives and
10. Disposal of public complaints.

SUPERINTENDING ENGINEERS
(Field Circles)

Technical (Weightage 50)

1 Overview and monitoring Development and Rehabilitation Works in the Circle (15)

- Identification of ADP, Rehabilitation & Improvement and Remodelling Schemes and Preparation of ADP Program on scheduled time;(5)
- Project Preparations as per approved Program; (5)
- Project Implementation in the given time frame. (5)

2 Overview and monitoring Operation & Maintenance of canals (20)

- Inspection of channels by himself and Executive Engineers and subordinate staff as per Dept. guidelines;(4)
- Preparation and approval of annual M&R work plans by schedule date;(4)
- Implementation of the approved work plans in the given time frame;(4)
- Inspection of the state of various works in the circle and to satisfy himself that the system of management prevailing is efficient and economical.(4)

3 Overview and monitoring regulation of canal supplies and its equitable distribution within the system; (10)
(List of indicators to be given by PMIU)

4 Adjudication of cases under Canal and Drainage Act and judicious disposal of other revenue cases.

5 Overview and monitoring performance of the Revenue Staff in the Circle.(5)
(List of indicators may be got framed from a senior Canal Collector)

Financial (20 marks)

1. Overview and monitoring efficient maintenance of accounts in the lower offices as per codal procedures to ensure financial discipline; (4)
2. Monitoring budget preparation and timely submission of periodical returns.
3. Overview and monitoring budget allocation and utilization in the circle;
4. Inspection of each divisional office in the circle at least once in a year to examine various accounts documents.
5. Examination of books of the divisional officers and their subordinates to see that accounts fairly represent the progress of each work.
6. Examine the register of works so as to keep a vigilant watch over the rates of works.
7. Investigate excesses over subheads to decide whether a revised estimate is required for the work.
8. Ensure that no delay is allowed to occur in the submission of completion reports where necessary.
9. Monitoring disposal of audit observations and draft paras. (4)

Administrative (20 marks)

1. Overview and monitoring general performance efficiency and discipline in the Circle; (4)
2. Disposal of disciplinary cases; (4)
3. ACRS by all concerned in the zone as per prescribed time schedule; (4)
4. Postings and transfers in the Circle as per Govt. Policy (4); and
5. Filling of vacant posts. (4)

General (20)

1. Overview and monitoring general performance efficiency and discipline in the zone;
2. Postings and transfers in the zone as per Govt. policy.
3. ACRS by all concerned in the zone as per prescribed time schedule

4. Disposal of disciplinary cases within given time frame;
5. Systematic touring by the field Officers as per Departmental instructions.
6. Decision making on issues referred by lower offices regarding administrative, technical, financial and revenue matters;
7. Liaison & coordination with other Departments.
8. Interaction with public and public representatives and
9. Disposal of public complaints.

EXECUTIVE ENGINEER
(Operation Division)

Technical (Weightage 50)

1 Development and Rehabilitation Works in the Division (15)

- Identification of ADP, Rehabilitation & Improvement and Remodelling Schemes and Preparation of ADP Program on scheduled time;(5)
- Project Preparations as per approved Program; (5)
- Project Implementation in the given time frame. (5)

2 Operation & Maintenance of canals in the Division (20)

- Inspection of channels by himself and the subordinate staff as per Dept. guidelines;(4)
- Preparation of annual M&R work plan by schedule date;(4)
- Implementation of the approved work plan in the given time frame;(4)
- Checking the preliminary survey of under water works up to the prescribed limit;
- Check measuring the underwater works up to prescribed limits.
- Inspection of the state of various works in the Division and to satisfy himself that the system of management prevailing is efficient and economical.(4)

3 Regulation of canal supplies and its equitable distribution in the Division; (10)

- Ensure periodical check of the discharge of Channels and outlets;
- Ensure periodical Physical check of the outlets;
- Ensure Preparation and maintenance of H Registers and outlet efficiency diagrams. (List of indicators to be given by PMIU)

4 Adjudication of cases under Canal and Drainage Act and judicious disposal of other revenue cases.

5 Overview and monitoring performance of the Revenue Staff in the Circle.(5)
(List of indicators may be got framed from a senior Canal Collector)

Financial (20 marks)

1. Ensure maintenance and upkeep of departmental stores of Stock & T&P articles including Survey and mathematical instruments by Ensuring;

   - Periodical physical checks;
   - Correctness of records of cash and stores, receipts and expenditures and
   - Preparation and submission of monthly accounts of the division to the Audit Office.

2. Budget preparation and timely submission of periodical returns.
3. Budget utilization in the Division;
4. Inspection of sub-divisional offices in the division at least once in a year to examine various accounts documents.
5. Keeping a watch over excesses/ surrenders over subheads of works and taking appropriate action.
6. Provide immediate information of the probability of excess to the SE.

7. Ensuring that no delay is allowed to occur in the submission of completion reports where necessary.
8. Disposal of audit observations and draft paras. (4)

Administrative (20 marks)

1. Maintaining performance efficiency and discipline in the Division; (4)
2. Disposal of disciplinary cases; (4)
3. ACRS by all concerned in the zone as per prescribed time schedule; (4)
4. Postings and transfers in the Division as per Govt. Policy (4); and
5. Filling of vacant posts. (4)

General (20)

1. Taking measures to preserve all the buildings and works in the division.
2. Preventing encroachments on Government land.
3. Ensuring safe guard and preventing accidents to all canal and drainage works in the division.
4. Decision making on issues referred by lower offices regarding administrative, technical, financial and revenue matters;
5. Liaison & coordination with other Departments.
6. Interaction with public and public representatives and
7. Disposal of public complaints.

SUB-DIVISIONAL OFFICER
(Operation Subdivision)

Technical (Weightage 50)

1 Development and Rehabilitation Works in the Sub-Division (15)

- Assisting in identification of ADP, Rehabilitation & Improvement and Remodelling Schemes and Preparation of ADP Program in scheduled time;(5)
- Project Preparations as per approved Program; (5)
- Project Implementation as per given time frame. (5)

2 Operation & Maintenance of canals in the Sub-Division (20)

- Inspection of channels by himself and the subordinate staff as per Dept. guidelines;(4)
- Assist in preparation of annual M&R work plan of the Division by the scheduled date;(4)
- Implementation of the M&R works in the Sub-Division time as per plan in accordance with the Dept. Quality Assurance System;(4)
- Checking the preliminary survey of works up to the prescribed limit;
- Check measuring the works up to prescribed limits.

3 Regulation of canal supplies and its equitable distribution in the Division; (10)

- Checking discharge of Channels and outlets periodically as per Dept. Orders;
- Reporting to police any damage/alteration done to outlets/ canal structure;
- Ensuring periodical Physical check of the outlets;
- Preparing and maintaining H Registers and outlet efficiency diagrams and
- Maintaining tail gauge register to monitor state of tail gauges
  (List of indicators to be given by PMIU)

4 Adjudication of cases under Canal and Drainage Act and judicious disposal of other revenue cases.

Financial (20 marks)

1. Maintain and upkeep of departmental stores of Stock & T&P articles including Survey and mathematical instruments by:
    - Carrying out physical checks periodically.
    - Ensuring the correctness of records of cash and stores, receipts and expenditures and
    - Preparation and submission of monthly accounts of the Sub-division to the Divisional Office.

2. Assisting Divisional office in budget preparation and timely submission of periodical returns.
3. Budget utilization in the Sub-Division;
4. Keeping a watch over excesses/ surrenders over subheads of works and prepare revised estimate if required;
5. Preparation and submission of completion reports where necessary.
6. Assist Divisional office in Disposal of audit observations and draft paras. (4)

General (20)

1. Maintaining performance efficiency and discipline in the Sub-Division; (4)
2. Taking measures to preserve all the buildings and works in the Sub-division.
3. Preventing encroachments on Government land.
4. Ensuring safe guard and preventing accidents to all canal and drainage works in the Sub-division.
5. Liaison & coordination with other Departments.
6. Interaction with public and public representatives and
7. Disposal of public complaints.

SUB-Engineer
(Operation Section)

Operational

1 Inspection of channels in the section as per Dept. guidelines;(4)
2 Assist in preparation of annual M&R work plan of the Division by scheduled date;(4)
3 Implementation of the M&R works as per plan in accordance with the Quality Assurance System of the Dept. ;(4)
4 Conduct preliminary survey and prepare the estimates of M&R, Development, Remodelling, Improvement and Rehabilitation Schemes as per given time schedule;
5 Supervise execution of works and take measurements thereof in the measurement books and prepare Contractor's bills;
6 Put up measurement books regularly to his SDO at least twice a month;
7 Provide assistance in preparation and submission of annual budget and other financial returns;
8 Safe guard and prevent accidents to all canal and drainage works within his section;
9 Assist SDO/XEN in carrying out regulation of canal supplies to ensure equitable distribution within the system;
10 Check the discharge of Channels and outlets including tail outlets;
11 Report any damage/alteration done to outlets/ canal structures;
12 Maintain Outlet notebooks and physically check all the outlets during a month;
13 Prepare command statements in revenue cases u/s 20 and 68;
14 Prepare and maintain H Registers and outlet efficiency diagrams;
15 Ensure Efficient performance and discipline in the subordinate Staff;
16 Submission of various periodical returns due from him as per specified time schedules.

Accounts

1 Maintain and upkeep of departmental stores of Stock & T&P articles including Survey and mathematical instruments by;

- Carrying out periodical physical checks.
- Maintaining accounts of Issue and receipts of store articles.
- Preparation and submission of monthly accounts of Issues and receipts of store articles.

2 Provide assistance for Disposal of audit observations and paras.

Canal Collector

1. Over view and monitoring performance of Revenue establishment and related matters in the zone.
2. Control on malpractices by revenue staff.
3. Inspection of Circle and Divisional Revenue offices .
4. Overall performance of duties assigned to him in the Revenue Manual.

Deputy Collector

Over view and monitoring performance of Revenue establishment and related matters in the division.
Control on malpractices by revenue staff.
Inspection of Subdivisional Revenue offices.
Overall performance of duties assigned to him in the Revenue Manual.

The Zilladar

1. Performance of revenue field work;
2. Monitoring performance of Canal Patwaris;
3. Preparing and checking the demand statements.
4. Conducting preliminary investigations in revenue cases and cases of theft of water.
5. Performance of duties assigned to him in the Revenue Manual.
6. Coordination with the Engineering staff.

The Patwari

1. Field work for recording unauthorized irrigation
2. Interaction with public.
3. Performance of duties assigned to him in the Revenue Manual.
4. Coordinate with the Engineering staff