



**Environmental Audit Report
on
Mangroves Devastation and
their critical role on Environment
Government of Sindh
Audit Year 2017-18**

AUDITOR-GENERAL OF PAKISTAN

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PREFACE

The Auditor-General conducts audits subject to Articles 169 and 170 of the Constitution of the Islamic Republic of Pakistan 1973, read with sections 8, 10 and 12 of the Auditor- General (Functions, Powers and Terms and Conditions of Service) Ordinance 2001. The Environmental audit on the topic “Mangroves Devastation and their critical role on Environment”, Sindh Forest Department, Govt. of Sindh was carried out accordingly.

The Directorate General Audit Sindh conducted the environmental audit on “Mangroves Devastation and their critical role on Environment” from January to April, 2018 for the period from 2011-12 to 2016-17 with a view to reporting significant findings to stakeholders. Audit examined the economy, efficiency, effectiveness and environmental aspects of the schemes launched by the Sindh Forest Department. In addition, Audit also assessed, on test check basis, physical and financial progress reports, impact & role of mangroves, effectiveness of management information system, human resources aspect, measures on devastation & conservation of mangroves besides, environmental external issues. The Audit Report indicates specific recommendations that would help the management to improve the financial management system, monitoring & evaluation mechanism, human resources management measures and strategy of identification of risk management system to address environmental issues and external challenges. The observations included in this report have been finalized in the light of discussions in the Exit Conference/Meeting.

The Audit Report is submitted to the Governor Sindh in pursuance of the Article 171 of the Constitution of the Islamic Republic of Pakistan 1973 for causing it to be laid before the Provincial Assembly.

Dated:

(Javaid Jehangir)
Auditor-General of Pakistan

ABBREVIATIONS AND ACRONYMS

CDMIDMCSI	Conservation, Development & Management of Indus Delta Mangroves to Check Sea Intrusion
GIS	Geographic Information System
Ha	Hectare
IDM	Indus Delta Mangroves
INTOSAI	International Organization of Supreme Audit Institutions
IUCN	International Union for Conservation of Nature
PAO	Principal Accounting Officer
PC	Planning Commission
PD	Project Director
PRMCSIID	Possible Role of Mangroves in Curbing Sea Intrusion in Indus Delta
PSC	Project Steering Committee
SFD	Sindh Forest Department

EXECUTIVE SUMMARY

The Director General of Audit Sindh, conducted Environmental audit on “Mangroves Devastation and their critical role on Environment ” from January to April, 2018. The main objectives of the audit were to assess, on test check basis, measures & role of mangrove schemes executed by the Forest Department, analysis of management information system, performance in financial management, human resources management, efforts and measures in bringing effective controls over devastation of Mangroves and their protection, its importance in human life, implementation issues, internal controls and environmental / external issues and their impact on mangroves. Another objective was examination of the economy, efficiency, and effectiveness aspects of the schemes launched by the Forest Department. The audit was conducted in accordance with the International Standards of Supreme Audit Institutions.

The Sindh Forest Department has been executing two schemes viz., “Conservation, Development & Management of Indus Delta Mangroves to Check Sea Intrusion” having PC-I cost of project Rs631.670 million and another project “Possible role of Mangroves in curbing sea intrusion in Indus Delta” having PC-I cost of Rs698.110 million. Total cost incurred on two projects upto financial year of audit 2016-17 comes to Rs759.605 million. The Projects have been sponsored by Government of Sindh, implemented & executed by Sindh Forest Department and International Union for Conservation of Nature (IUCN) included in the ADP schemes from 2011-12 to 2017-18 and works have been executed in the locations at Thatta, Badin & Karachi districts. The main Projects’ objectives was plantation of mangroves in blank degraded areas to avoid sea intrusion; improve marine habitat and combat threats of tsunamis/cyclones in Sindh coastal belt; reforest and rehabilitate sparse mangroves; to protect coastal communities, their agricultural lands, livestock from ravages of sea intrusion; develop a mechanism of constant surveillance and monitoring within the creek system; alleviate poverty by providing employment and income generation through project activity and enhanced fishing production; capacity building and human resources development of Sindh Forest Department; involvement of coastal communities in development and conservation activities; begin eco-tourism activities for general public and to protect coastal areas

in the wake of global climate change and above all achievement of Quantitative/specific targets in the light of Projects' PC-I.

Major findings of the environmental study with respect to Mangroves and their role on environment are non-achievement of Projects' objectives as per timelines mentioned in the PC-I. Ex-aggerated cost of items over and above estimated cost of works. Non-Development of permanent mechanism of monitoring and evaluation of the projects' works, their effects and impact assessment procedure in respect of environmental improvement and degradation has not been in place especially by the outside agency/expert with continuous monitoring besides up-gradation of GIS Laboratory. Post-evaluation and analysis tools of the projects benefits/achievements made with quantification numbers were not in place. Research & Development framework and up gradation of GIS Laboratory was not done. Issues of potential significance and the strategies to cope up with were not yet developed. No efforts by the forest department were undertaken with the other departments for catering to challenges of sea water intrusion and low river water. No pro-active measures were taken to tackle land degradation because of sea water intrusion. Non-appointment of staff as per PC-I provision and non-development of organogram of the Projects with delegation of duties was evolved/made.

The audit mainly recommends steps for proper monitoring and evaluation mechanism should be evolved in the Forest Department with the inclusion of stakeholders, prominent environmental experts and up gradation of GIS Laboratory in accordance with PC-I provision and international standards. Timely completion of projects' objectives item-wise task accomplishment as per PC-I timelines. Quantification of targets achieved and their benefits derived accordingly especially environmental betterment. Appointment of staff and technical experts as per PC-I provision and development of human resource management as per their tasks. Measures to cater to land degradation, sea water intrusion and low supply of river water damaging the mangroves by collaboration with the other stakeholders. Application of risk-based strategies to address uncertainties of environmental hazards/challenges to target identical critical & risky areas in order to minimize adverse effects on Mangroves. Development of alternative livelihoods for mangroves' dependent communities as a means to reduce mangrove destruction such as eco-tourism.

1. INTRODUCTION

The Director General of Audit Sindh, conducted Environmental audit on "Mangroves Devastation and their critical role on Environment " from period January to April, 2018.

Mangroves are trees or large shrubs which grow within the intertidal zone in tropical and subtropical regions and have Special adaptations to survive in this environment. Mangrove is in fact a general name for several Species of Delta plant which can survive in saline environment.

Geographically, Mangroves occur worldwide in the tropics and subtropics, mainly between latitudes 25° N and 25° S. The total mangrove forest area of the world in 2000 was 137,800 square kilometers (53,200 sq mi), spanning 118 countries and territories. They are generally distributed above and below the equator, between the 20°C isotherms. Mangroves are also sensitive to below zero temperatures and damaged by stones. At colder latitudes, mangroves are often replaced by salt marls. Asia has the largest amount (42%) of the world's mangroves

Pakistan is largely arid and semi-arid, receiving less than 250 mm annual rainfall, with the driest regions receiving less than 125 mm of rain annually. It has a diverse landscape, with high mountain systems, fragile watershed areas, alluvial plains, coastal mangroves, and dune deserts. Forests cover approximately 4.58 million ha (5.7 percent) in Pakistan. (Government of Pakistan, 1996) of these, 0.132 million ha (less than 3 percent) are coastal mangrove forests. Pakistan is divided into 18 habitat types, among them mangrove forests, which occur mainly in the Indus Delta and in a few patches westward along the Baluchistan Coast.

Existing estimates show that mangroves cover approximately 129,000 ha in the Indus Delta and about 3,000 ha on the Baluchistan Coast in the MianiHor, Kalmat Khor, and Gawatar Bay areas. The Indus Delta therefore supports 97 percent of the total mangrove forest (37 percent of the Delta area) while the three pockets on the Baluchistan Coast support the remaining 3 percent (varying from 8 percent of the total area in Gawatar Bay to 21 percent in Kalmat Khor and 25 percent in MianiHor).

The Indus Delta covers approximately 600,000 ha with a coastline of 250 km, bordering the city of Karachi in the northwest. The Indus Delta is comprised of 17 major creeks, numerous minor creeks, extensive areas of mudflats, and 129,000 ha of mangrove forests. The dense forests are mostly located in the pockets created by the creeks. The source of fresh water is the perennial river Indus that flows through the Delta before reaching the Arabian Sea. The Indus Delta shelf is 150-km wide and receives scanty rainfall during the monsoon season. The average wind speed during these months varies from 12 km to 35 km.

The Indus delta mangroves are under the management control of four different organizations, which are as follows:

Organization	Area under control
Sindh Forest Department, Sindh	280,470 ha (693,000 acres)
Port Qasim Authority, Sindh	64,400 ha (159,000 acres)
Karachi Port Trust, Sindh	2,000 ha
Sindh Board of Revenue, Sindh	260,000 ha (630,000 acres)

Area under the control of Sindh Forest Department and Port Qasim Authority is declared as "Protected Forests". The area under the control of Board of Revenue is classified as "Government wasteland".

At present, there are four mangrove species found in the Indus delta:

- i. *Avicennia marina* about 90 %
- ii. *Rhizophora mucronata* about 08 %
- iii. *Aegiceras corniculatum* about 1.5%
- iv. *Ceriops tagal* about 0.5 %

PROJECT DIGEST-A

1.Name of Project	Conservation, Development and Management of Indus Delta Mangroves to Check Sea Intrusion
2.Location	Indus delta (Thatta, Badin & Karachi Districts.
3.Authorities responsible for Sponsoring	Government of Sindh
Execution	Chief Conservator of Forests, Sindh
Operation & Maintenance	Project Director/Conservator “Conservation, Development and Management of Indus Delta Mangroves to Check Sea Intrusion through Divisional Forest Officers, Coastal Forest Division”.
4.Plan Provision	Ongoing 2011-12 to 2017-18
5.Capital Cost of Project	Rs631.670 million (CDMIDMCSI)
6.SourceofFunds/Budget Releases	Government of Sindh,as per Revised PC-I Rs528.103 million (2011-12 to 2016-17)
7.Year-wise Capital Cost	Rs58.465 m 1 st Year Rs92.883 m 2 nd Year Rs93.118 m 3 rd Year Rs97.223 m 4 th year Rs78.027 m 5 th year Rs73.755 m 6 th year

PROJECT DIGEST -B

1.Name of Project	“Possible Role of Mangroves in Curbing Sea Intrusion in Indus Delta”.
2.Location	Indus Delta (Taluka Keti Bunder and Karo Chan, Thatta districts
3.Authorities responsible for Sponsoring	Planning and Development Department, Government of Sindh through Forest Department, Sindh
Implementation	Sindh Forest Department &International Union for Conservation of Nature (IUCN)
Operation & Maintenance	Sindh Forest Department & International Union for Conservation of Nature (IUCN)
4. Plan Provision	ADP 2013-14 of Sindh Forest Department
5.Capital Cost of Project	Rs698.110 million (PRMCSIID)
6.Source of Funds/Budget Releases	Government of Sindh
7.Year-wise Capital Cost	Rs24.796 m Year 2013-14 Rs70.476 m Year 2014-15 Rs74.348 m Year 2015-16 Rs96.516 m year 2016-17

2. ENVIRONMENTAL AUDIT OBJECTIVES

- 2.1 To measure the impact & role of mangrove schemes executed by the Forest Department, Government of Sindh.
- 2.2 Determine how well the management information systems and equipment are performing.
- 2.3 How far the department performed well in financial management and how well the human resources were employed.
- 2.4 To analyze what extent the departments are effective in bringing control over devastation of Mangroves.
- 2.5 To test the adequacy of existing management system/efforts and conservation of mangroves' measures.
- 2.6 Role of Mangroves in protecting the coastline and prevention of erosion.
- 2.7 To study in detail the importance of mangroves in human life.

3. SCOPE AND METHODOLOGY

- 3.1 The Environmental Audit was conducted on the review of record from financial year 2011-12 to 2016-17.
- 3.2 The scope of audit covered general information about Mangroves Plantation, their effects, impact on environment, challenges and measures taken by the forest department as a result of their Projects.
- 3.3 The Forest Department's Secretary, Chief Conservator and Conservators/Project Director/Coordinator of forest department have been contacted, held meetings for the general understanding of Mangroves, issues of potential significance and discussion as per Questionnaires served to them.
- 3.4 The audit was conducted with the help of development of Questionnaires, interviews, discussions, some internet articles, PC-I documents, financial and physical progress reports, Articles, pamphlets, organogram, site visits and expenditure statements.
- 3.5 The methodology adopted covers compliance & implementation issues, Internal control systems, Management information systems.
- 3.6 Environmental/ external issues and their impact on Mangroves.
- 3.7 Identification of issues through vetting record/material available on internet, literature review, articles etc.

4. AUDIT FINDINGS AND RECOMMENDATIONS

4.1 Organization and Management

4.1.1 Non-appointment of independent project directors – Rs1,329.780 million

According to Planning and Development Division, Government of Pakistan, vide letter No.21(2-Gen)PIA/PC/2003, dated 31st March, 2004, addressed to the Additional Chief Secretary (Dev), Planning & Development Department, Government of Sindh, Karachi, “No approval is given to a new project costing Rs100 million or more unless an independent Project Director is included in the PC-I estimates or proper justification has been given in the PC-I for not having the Project Director”.

During environmental audit of financial year 2011-12 to 2016-17, it was observed that two projects costing Rs1,329.780 million as per PC-I, “Conservation, Development & Management of Indus Delta Mangroves to check sea intrusion” of Rs631.670 million and “Natural resource-based conservation, management & community livelihood – Possible role of Mangroves in curbing sea intrusion in Indus Delta” of Rs698.110 million respectively have been executed by the forest department without adoption of above instructions in respect of appointment of independent Project Directors required for new projects costing Rs100 million or more.

The irregularities were pointed out to the Management, but no response was received till finalization of this report. Further no DAC was convened by the PAO even repeated written requests.

Audit recommends compliance of above instructions without fail.

4.1.2 Non-appointment of human resources as per PC-I

According to para 13 of PC-I, “Management structure and manpower requirements including specialized skills during construction and operational phases” read with para 13.2, “available technical staff of Sindh Forest Department will implement the project along with establishment proposed under this project”.

During environmental audit of financial year 2011-12 to 2016-17, it was observed that two projects of Mangroves by the Forest Department were executed namely; “Conservation, Development & Management of Indus Delta Mangroves to check sea intrusion” and “Natural resource-based conservation, management & community livelihood – Possible role of Mangroves in curbing sea intrusion in Indus Delta” but the human resources had not been appointed in the light of PC-I provision which doubts over the utilization of financial resources from projects and their services rendered, as the organograms of the projects did not mention their posts and distribution of work. The detail is as under: -

- i) “Conservation, Development & Management of Indus Delta Mangroves to check sea intrusion”** (Expenditure incurred on establishment charges Rs40.398 million – 82% utilization) :
 - a) GIS Specialist (0 Nos. against PC-I 01.)
 - b) Divisional Forest Officer (01 against 0 post in the PC-I)
 - c) Range Forest Officer (05 Nos. against PC-I 02)
 - d) Computer Operator (0 Nos. against 2 Nos.)
 - e) Laboratory Assistant (0 Nos. against 01 Nos.)
 - f) Forester (11 Nos. against PC-I 03)
 - g) Cox Wain (0 Nos. against 03 Nos.)
 - h) Forest Guard (05 Nos. against 20)
 - i) Driver (0 Nos. against 03 Nos.)
 - j) Launch Driver (0 Nos. against 03 Nos.)
 - k) Launch Crew (0 Nos. against 03 Nos.)
 - l) Naib Qasid (0 Nos. against 02 Nos.)
 - m) Chowkidar (0 Nos. against 02 Nos.)

ii) **“Natural resource-based conservation, management & community livelihood – Possible role of Mangroves in curbing sea intrusion in Indus Delta”**(Expenditure incurred on establishment charges Rs24.140 million – only 27% utilization from 2012-13 till 2016-17) : -

- a) NRM Expert (0 Nos. against PC-01)
- b) NRM/Sociology Coordinator (0 Nos. against 1)
- c) Climate change Coordinator (0 Nos. against 1)
- d) DRR Specialist (0 Nos. against 1)
- e) Finance Officer (0 Nos. against 1)
- f) Computer Operator (0 Nos. against 1)
- g) Office Assistant (0 Nos. against 1)
- h) Naib Qasid (0 Nos. against 1)
- i) Driver (0 Nos. against 02)
- j) Field Supervisor (0 Nos. against 02)
- k) Field Assistant (0 Nos. against 02)
- l) Launch Driver (0 Nos. against 02)
- m) Launch Crew (0 Nos. against 02)

The irregularities were pointed out to the Management but no response has been received till finalization of this report. Further no DAC was convened by the PAO even repeated written requests.

Audit recommends that clarification of non-appointment of staff in the light of PC-I provision may be justified to Audit.

4.2 Financial Management

4.2.1 Non-achievement of Project targets as per PC-I timelines

As per PC-I of the two Projects namely, “Conservation, Development & Management of Indus Delta Mangroves to check sea intrusion” and “Natural resource-based conservation, management & community livelihood – Possible role of Mangroves in curbing sea intrusion in Indus Delta”

During environmental audit of financial year 2011-12 to 2016-17, it was observed that two projects of Mangroves, as stated above, were executed by the forest department without achievement of projects’ objectives and also not meeting PC-I timelines mentioned in items of works which were to be completed by 2015-16, detail at **Annex-A**.

Some of the findings are as follows: -

1. Non-achievement of project targets by the year 2015-16.
2. Delay in the execution of items of works as per PC-I timelines.
3. Ex-aggerated payment in contradiction to estimated cost of works of items.
4. Expenditure without provision in the year of occurrence, as mentioned in PC-I.
5. Shortfall in the targets set as per PC-I.

The irregularities were pointed out to the Management but no response has been received till finalization of this report. Further no DAC was convened by the PAO even repeated written requests.

Audit recommends revision of the PC-I documents besides necessary action against the Project Directors/Coordinators of the schemes executed by the Forest Department for non-compliance of provision of PC-I and shortfall in targets.

4.2.2 Expenditure without provision in the PC-I – Rs48.452 million

As per para 5.2.2 Project Objectives (Quantitative/Specific) of the Project “Conservation, Development & Management of Indus Delta Mangroves to check sea intrusion”, targets of various items of works have been fixed of Afforestation on 11,905 Ha in high-lying blank areas; afforestation on 13,924 Ha in partially blank mudflats; assisted natural regeneration on 14,980 Ha; inland salt tolerant species plantations on 2600 ha; afforestation for sand dune stabilization on 295 ha; initiation of incentives oriented programmes coastal communities; raising of 3.489 million mangrove and inland species container plants and initiation of research and development programme to study various aspects of mangrove ecosystem.

During environmental audit of financial year 2011-12 to 2016-17, it was observed that an Expenditure of Rs48.452 million was incurred on payment for items restocking and maintenance of new plantation but the items have not been included in the project objectives (General & Quantitative targets) at Para 5.2 (5.2.1 & 5.2.2) and thus expenditure was incurred without PC-I Objectives. Moreover, no activity was undertaken for the protection and maintenance of new plantation through local resident fishing households, with each household responsible for 200 Ha.

The irregularities were pointed out to the Management, but no response has been received till finalization of this report. Further no DAC was convened by the PAO even repeated written requests.

Audit recommends regularization of the expenditure from the competent authority.

4.3 Monitoring and Evaluation (M&E)

4.3.1 Expenditure without Third Party Monitoring & Evaluation of the project – Rs266.129 million

As per para 6.5 of PC-I of the Project “Natural resource-based conservation, management & community livelihood – Possible role of Mangroves in curbing sea intrusion in Indus Delta”, the project provides for monitoring and evaluation of the project activities by the third party. The activities implemented by SFD and IUCN will be validated by third party with the prior approval of Project Steering Committee

(PSC). The expert/agency engaged would conduct monitoring and evaluation of work on regular basis with the help of a team to evaluate project activities on regular basis.

During environmental audit of financial year 2011-12 to 2016-17, it was observed that no Monitoring & Evaluation was conducted in respect of the Project “Possible role of Mangroves in curbing sea intrusion in Indus Delta (PRMCSIID) as per timeline mentioned in the PC-I during the years 2012-13 (Year-1) and 2015-16 (Year-4).

Audit is of the opinion that without project’s monitoring & evaluation by the third party and prior approval of the Project Steering Committee on regular basis tantamount to violation of PC-I provision and questions the reliability of the project.

The irregularities were pointed out to the Management, but no response has been received till finalization of this report. Further no DAC was convened by the PAO even repeated written requests.

Audit recommends regular monitoring & evaluation of the project activities by the third-party agency/expert in order to get overview of the project activities / progress as per timelines mentioned in the PC-I.

4.4 Environment

4.4.1 Non-assessment of environmental effects due to non-achievement of project objectives– Rs365.490 million

As per para 5.2.2 Project Objectives (Quantitative/Specific) of the Project “Conservation, Development & Management of Indus Delta Mangroves to check sea intrusion”, targets of various items of works have been fixed of Afforestation on 11,905 Ha in high-lying blank areas; afforestation on 13,924 Ha in partially blank mudflats; assisted natural regeneration on 14,980 Ha; inland salt tolerant species plantations on 2600 ha; afforestation for sand dune stabilization on 295 ha; initiation of incentives oriented programmes coastal communities; raising of 3.489 million mangrove and inland species container plants.

During environmental audit of financial year 2011-12 to 2016-17, it was observed that quantification of works executed in respect of above project in numbers and their effects on environment/betterment in environment through contribution as work executed was not done by the Forest Department to assess the impact of the project in respect of Mangrove plantation done at the field site. Moreover, the department was doing Mangrove Plantation work at sites without feasibility studies of the areas selected as suitable for the mangrove plantation and their basis with regard to environmental effects and scenario at the sites especially in the wake of challenges of sea water intrusion and low river water availability for the sustainability of Mangroves in Sindh.

Moreover, as a result of Mangrove Plantation at sites, several attempts were made for maintaining survival ratio of plants and also minimizing mortality ratio of Mangroves in the areas of Thatta, Sujawal and Badin but how much attempts were become successful besides cost incurred on such attempts were not worked out in order to assess the exact success ratio of the Project Plantation.

The irregularities were pointed out to the Management, but no response has been received till finalization of this report. Further no DAC was convened by the PAO even repeated written requests.

Audit recommends formulation of post evaluation mechanism in the department for the ascertainment of impact on environment due to works of the project(s) at sites, assessment of contributions and betterment in the environment due to mangrove plantation and their proper monitoring mechanism besides involvement of independent environmental expert to assess the achievements of such projects in quantitative terms.

4.4.2 Non-achievement of project's objectives of mitigation of degradation of land and efforts for its adverse effects on environment– Rs5.848 million

As per para 5.2.1 Project Objectives (General) of the Project “Conservation, Development & Management of Indus Delta Mangroves to check sea intrusion”, there are certain objective to protect coastal communities, their agricultural lands, livestock and other infrastructure from the ravages of sea intrusion, tsunamis/

cyclones in coastal belt of Sindh. To protect existing mangroves of Indus Delta through a mechanism of constant surveillance and monitoring within the creek system. To alleviate poverty by providing employment and income generation opportunity to coastal dwellers through project activity and enhanced fishing production. To encourage participatory natural resource management techniques by involving coastal communities in development and conservation activities of Indus Delta Mangroves. To start eco-tourism activities in the coastal belt for the education and information of general public.

During environmental audit of financial year 2011-12 to 2016-17, it was observed that Rs5.848 million were incurred under Community mobilization & incentive-based programme without detail of activities relating to Community Mobilization and Incentive based Programs in 50 coastal villages and other facilities, efforts and outcome in respect of Rehabilitation of Indus Delta Mangroves (IDM) through scientific conservation. Moreover, following objectives have also not been achieved as per PC-I: -

1. No pro-active efforts towards degradation of land, its rehabilitation and protection of Mangroves affected due to environmental effects, reduced fresh water flow and tackle sea intrusion were carried out by the forest department.
2. No eco-tourism activities were promoted as a result of execution of Projects by the Department.
3. No measures were undertaken as per field visits in respect of Mangroves' contribution towards generation of habitat and eco-tourism as one of the Objectives of PC-I.
4. Civil work worth Rs2.136 million upto 2016-17 was executed whereas, as per PC-I, the work of Rs8.838 million would have been executed by that time and thus non-achievement of targets as per PC-I resulting into shortfall of Rs6.702 million (76%).

The irregularities were pointed out to the Management, but no response has been received till finalization of this report. Further no DAC was convened by the PAO even repeated written requests.

Audit recommends implementation of PC-I objectives as per timelines for the socio-economic development and community-based activities so that development could be made to achieve objectives at large.

4.4.3 Non-conduct of research on aspects of mangrove ecosystem and their impact on environment – Rs6.699 million

As per para 5.2.2 (h), Project Objectives (Quantitative/Specific) of the Project “Conservation, Development & Management of Indus Delta Mangroves to check sea intrusion”, there have been specific objective of initiation of Research and Development Programme to study various aspects of mangrove ecosystem. Moreover, as per para 6.2.6, of the project “Natural resource-based conservation, management & community livelihood – Possible role of Mangroves in curbing sea intrusion in Indus Delta”, there have been R&D Programme including training on integrating Environmental safeguard into Disaster Risk Reduction and training module as per PC-I Targets.

During environmental audit of financial year 2011-12 to 2016-17, it was observed that Rs6.699 million were incurred without appropriate and permanent initiatives for the development of Research and Development Programme including training on integrating Environmental safeguard into Disaster Risk Reduction and training module (Rs5.049 million – CDMIDMCSI & Rs1.650 million – PRMCSIID) in order to study and assess various aspects of mangrove ecosystem and their environmental impact including its pros and cons.

The irregularities were pointed out to the Management, but no response has been received till finalization of this report. Further no DAC was convened by the PAO even repeated written requests.

Audit recommends compliance of above provisions in the light of PC-I objectives and development of R&D wing in the Forest Department.

4.4.4 Non-upgradation of GIS Laboratory

As per para 6.3.15, GIS Based Monitoring of the Project “Conservation, Development & Management of Indus Delta Mangroves to check sea intrusion”, the project provides for GIS based continuous monitoring and evaluation mechanism within the ambit of the project through fulltime GIS Specialist. The specialist will be responsible for Establishment of GIS Laboratory/ Unit, Development of GIS Layers vector/ Raster, development of GIS base Maps for the decision-making, change analysis of natural resources, monitoring of mangroves Eco-system using GIS and remote sensing tools, development of networking, VPN, SOL, Query and database management, Geo-referencing Map development in Deh Level, creek system, development of Digital Atlas and Geo-Database, Web tools for Web update and modification and any other activity required by the Government.

During environmental audit of financial year 2011-12 to 2016-17, it was observed that no performance of GIS laboratory in the light of above stated tasks have been accomplished as no work was done as required above.

Moreover, the task above, to a large extent, been outsourced by the Project Director instead of doing the same by the GIS Laboratory, which shows that the laboratory has not been functioning at the optimum level as the department does not upgrade its system requirements in the wake of project demands’ and requirements.

The irregularities were pointed out to the Management, but no response has been received till finalization of this report. Further no DAC was convened by the PAO even repeated written requests.

Audit recommends upgradation of the laboratory in the light of above provision in the PC-I.

4.4.5 Non-verification of claim of achievement of 225,000 Hectares Mangrove Plantation by the Forest Department

As per para 6.1 of the project “Conservation, Development & Management of Indus Delta Mangroves to check sea intrusion”, the project has been prepared to check the growing effects of Sea Intrusion through biological means of planting mangroves and Inland species to create biological barriers along with minor earthen

structures to stop insurge of sea water into the productive agricultural lands, thereby creating better resource base for the poor coastal communities.

During environmental audit for the financial year 2011-12 to 2016-17, it was observed that no proper survey of the areas/sites of Mangrove cover by the independent sources/agencies in order to assess claim of the Department of achieving 157,000 Hectare across Sindh was carried out and the plantation increased due to execution of Projects of which the department had claiming achievement of 67,836 Hectares in the areas of Karachi, Thatta, Sujawal and Badin, which comes to 225,000 Hectares in total. Moreover, no specific locations were shared in respect of Mangrove cover in Sindh, areas of Mangroves planted during 2011-12 to 2016-17 especially Karachi, Thatta, Sujawal and Badin.

The irregularities were pointed out to the Management, but no response has been received till finalization of this report. Further no DAC was convened by the PAO even repeated written requests.

Audit recommends production of proof of areas of Mangrove cover across Sindh of which claim of achievement of 157,000 Hectares prior to commencement of projects and 67,836 Hectares thereafter made by the Forest Department in Sindh.

4.4.6 Non-production of record – Rs18.099 million

As per Section 14(2) of the Auditor General’s (Functions, Powers and Terms and Conditions of Service) Ordinance, 2001, “The officials shall afford all facilities and provide record for Audit and comply with request for information in as complete a form as possible and with all reasonable expedition”. Further as per Section 14 (3) *ibid*, “Any person or authority hindering the auditorial functions of the Auditor-General regarding inspection of accounts shall be subject to disciplinary action under relevant Efficiency and Discipline Rules, applicable to such person”.

During environmental audit for the financial year 2011-12 to 2016-17, it was observed that following record of expenditure in respect of two schemes of Forest Department have not been produced, as detail below: -

1. No detail of expenditure incurred of Rs4.849 million on Training and Consultancy Programs including activities formal and informal trainings on Disaster Risk Reduction and imparting to unskilled labours, flood affectees and the village organizations for their capacity building on regular basis were provided of project “Conservation, Development & Management of Indus Delta Mangroves to check sea intrusion”.
2. Rs4.250 million have been incurred under “Community based Incentive Programme” as per PC-I provision but no detail of activities in respect of Community Mobilization and Incentive based Programmes in 50 coastal villages and other facilities were provided to audit of project “Natural resource-based conservation, management & community livelihood – Possible role of Mangroves in curbing sea intrusion in Indus Delta”.
3. No trainings, visits and consultancy programmes have been organized/ conducted from 2012-13 till 2016-17 as per PC-I worth Rs9.00 million of the project “Natural resource-based conservation, management & community livelihood – Possible role of Mangroves in curbing sea intrusion in Indus Delta”.

The irregularities were pointed out to the Management, but no response has been received till finalization of this report. Further no DAC was convened by the PAO even repeated written requests.

Audit recommends production of auditable record without fail.

ACKNOWLEDGEMENT

We wish to express our appreciation to the Management and staff of Sindh Forest Department, Govt. of Sindh for the assistance and cooperation extended to the auditors during this assignment.

Annexure-A

Project “Conservation, Development & Management of Indus Delta Mangroves to check sea intrusion”

S.No.	Name of Works/Items	PC-I Target	As per Financial & Physical progress reports
1	Afforestation in High-lying Blank Areas	Target Quantity – 11905 (2015-16) Target Year 2015-16 Estimated amount Rs131.198 million	<p>i. Achievement Qty 8705 upto 2015-16 (lesser during 2014-15 [1800/3500] & 2015-16 [2000/3500]) whereas work is still in Progress paid Rs116.730 million upto 2016-17</p> <p>ii. Actual amount determined @ RS10,334 x Qty 11905 = Rs123.026 million whereas estimated Rs131.198 million, excess & exaggerated payment Rs8.172 million (during 2011-12, 2012-13 & 2013-14)</p> <p>iii. iii.Rs18.601 million expenditure incurred during 2016-17 without provision in the PC-I</p> <p>iv. The work has not been completed by 2015-16 of quantity 3200 worth Rs33.069 million out of total quantity 11905 as per PC-I and also shortfall upto 2016-17 of quantity 1400 (10505/11905)</p>
2	Afforestation in Partially Blank Mudflats	Target Quantity – 13924 (2015-16) Target year 2015-16 Estimated amount Rs127.578 million	<p>i. Achievement Qty 11804 upto 2015-16 (lesser during 2014-15 [2880/3500] & 2015-16 [2000/3500]) whereas work is still in progress paid Rs124.911 million upto 2016-17</p> <p>ii. Actual amount determined @ Rs8,334 x Qty 13924 = Rs116.043 million whereas</p>

S.No.	Name of Works/Items	PC-I Target	As per Financial & Physical progress reports
			<p>estimated Rs127.578 million, excess & exaggerated payment Rs11.535 million (during 2011-12, 2012-13 & 2013-14)</p> <p>iii. Rs15.000 million expenditure incurred during 2016-17 without provision in the PC-I</p> <p>iv. iv. The work has not been completed by 2015-16 of quantity 2120 worth Rs17.668 million out of total quantity 13924 as per PC-I and also shortfall upto 2016-17 of quantity 320 (13604/13924)</p>
3	Assisted Natural Regeneration	<p>Target Quantity – 14980 (2015-16)</p> <p>Target year 2015-16 Estimated amount Rs95.490 million</p>	<p>i. Achievement quantity 13001 upto 2015-16 (lessor during 2014-15 [3001/3500] & 2015-16 [2500/3980]) whereas work is still in progress and paid Rs92.617 million upto 2016-17</p> <p>ii. Actual amount determined @ Rs5,998 x Qty 14980 = Rs89.850 million whereas estimated Rs95.490 million, excess & exaggerated payment Rs5.640 million (during 2011-12, 2012-13 & 2013-14)</p> <p>iii. Rs8.997 million expenditure incurred during 2016-17 without provision in the PC-I</p> <p>iv. The work has not been completed by 2015-16 of quantity 1979 worth Rs11.870 million out of total quantity 14980 as per PC-I and also shortfall upto 2016-17 of quantity 479 (14501/14980)</p>

S.No.	Name of Works/Items	PC-I Target	As per Financial & Physical progress reports
4	Raising of Mangrove Container Plants	Target Quantity – 3489260 (2017-18) 3120426 (2016-17) Estimated cost Rs20.936 million	i. Achievement quantity 2948926 upto 2016-17 against target 3120426 and thus shortfall of quantity 171500 @ Rs6 per unit worth Rs1.029 million ii) Lesser achievements of quantity of work during individual years 2014-15 [75000 x 6 =Rs0.450 million] & 2015-16 [200000 x 6 = Rs1.200 million]
5	Restocking of New Plantation	Target Quantity – 9427 (2015-16) Estimated cost Rs40.534 million	i. Achievement quantity 5472 upto 2015-16 against target of quantity 9427; shortfall of quantity 3955 worth Rs17.006 million [3955 x @ Rs4300] ii. payment of Rs7.465 million during 2016-17 without provision in the PC-I iii. The work has not been completed upto 2015-16 as per PC-I and infact upto 2016-17 resulting into shortfall of Quantity 2219 [@Rs4,300] worth Rs9.542 million
6	Protection & Maintenance of New Plantation	Target Quantity – 43704 (2017-18) Estimated cost Rs61.105 million	i) As per expenditure statement amount of Rs17.458 million upto 2016-17 have been paid whereas the same as per PC-I provision Rs42.749 million would have been done and thus Rs25.291 million work has not been executed.

Project “Natural resource-based conservation, management & community livelihood – Possible role of Mangroves in curbing sea intrusion in Indus Delta”

S.No.	Name of Works/Items	PC-I Target	As per Financial & Physical progress reports
1	Mangrove protected plantation in frontage and back water	<p>Target Quantity –up to 2016-17, 32,800 ha</p> <p>Target Year Estimated Amount Rs309.796 million at the rate Rs 9445/ha</p>	<p>I. Achieved Qty 22,367 up to 2016-17 from 2013. (shortfall 10,433/32,800 ha i-e 31%)</p> <p>Whereas work is still in progress worth Rs98.540 million up to 2016-17.</p> <p>II. Estimated as per PC-I Rs415.580 million Actual estimate Rs408.968 million (Rs 9445 x 43300 ha) Difference in PC-I Rs6.612 million</p>