



Hydrology Project Phase-II

Surface Water

PROJECT COMPLETION REPORT (PCR)

**IRRIGATION & CAD DEPARTMENT
GOVERNMENT OF ANDHRA PRADESH**

Hydrology Project Phase-I (Credit No.2774-IN)

Surface Water Component, Andhra Pradesh

Back Ground and Objective of Hydrology Project

Prior to inception of the Hydrology project, the information on water resources, quantitatively and qualitatively was neither reliable nor was its temporal spatial coverage sufficient for proper planning, design and operation purposes. Particularly Surface Water quality and quantity data are lacking or often appear to be of poor quality. The monitoring networks, equipment and practices as well as the validation and dissemination procedures are poorly tuned to the present day requirements. The state was short of skilled staff in department, due to lack of training and frequent transfers to staff resulting in a weak hydrological oriented environment. Procurement procedures and disbursement of funds are often very lengthy, which frustrates timely implementation and reduce motivation and enthusiasm of the concerned staff. Standardisation of equipment and procedures and exchange of information are strongly hampered by the absence of an inter-agency communication culture.

In the Government of India's National water policy the first priority is provision of domestic water supplies for urban and rural population but also recognises the water needs of irrigation, hydro and thermal power, industry, Navigation, Pollution control, Wild life and environment. A standardised national information system should be established with a network of data banks and data bases, integrating and strengthening the existing central and state level agencies and improving the quality of data and the processing capabilities. There should be free exchange of data among the various agencies and duplication of data collection should be avoided.

As a result, the Hydrology Project (HP) was embarked upon to support, the establishment of reliable, sustainable and easily accessible data bases at agency, State and National level for climatic, surface water and ground water quantity and quality data, fit to the requirements of the users. Each data base is embedded in an information system, which covers the Hydro – meteorological infrastructure and resources including the collection, entering of the parameters, their processing, validation, storage and dissemination. The hydrology project therefore includes, on one hand, the expansion and upgrading of the infrastructure to collect, enter, validate, store, process and distribute hydrological and hydro meteorological data, using standardised equipment and procedures and on the other hand strengthening of the human resources area.

Hydrology Project phase-1 was formed and completed with the following objectives

- Use of standardized equipment and adequate procedures for data collection and processing.
- Computerized comprehensive and easily accessible data.
- Demand drives dissemination of validated and reliable data.
- To improve Technical capabilities to measure, analyze and disseminate the Hydrological data with regard to quality and quantity for use in different fields.

Network created under HP-1

Hydrological :

- 77 no.s Gauge and Discharge sites on various minor streams,
- 40 no.s Digital Water Level recorders at various reservoir sites.

Hydro-meteorological :

- 208 no.s Standard Raingauge stations,
- 80 no.s Autographic Rain gauge stations,
- 8 no.s Full climatic stations.

Water Quality :

- 36nos. sampling stations at various streams.

Infrastructure Established under HP-1

- 15 no.s of Water quality Level-I Labs
- 2 no.s of Water quality Level-II Labs
- 1no. State Water Data Center
- 3 no.s of Divisional data processing centers
- 8 no.s of Sub - divisional data processing centers
- 11 no.s of Section offices.
- 69 no.s of Site equipment store sheds.

Procurement under HP-1

The procurement was done following the Procedures for Procurements for the bank financed projects in respect of ICB, NCB and local shopping procedures. The bids for procurement of goods were called for as per the procurements of guidelines of the bank.

Details of procurement was shown in the Separate statement enclosed.

Training to the staff

The need based trainings from NIH, NWA and other institutions are given to the staff on specific aspects of Hydrology such as computer application and introduction of relevant software like SWDES, HYMOS and WISDOM. In addition to the above trainings are given in basic and advanced short term computer courses at local institutions like CMC and WALAMTARI.

The project has trained 1626 persons in a sustained coordinated and focused way keeping in view overall organizational policy.

Data processing and Management

All sub divisions, divisions and State data processing center are equipped with computers which are being handed by training staff for data entry, validation and processing.

The data collection from field stations is validated at three levels such as
a) Primary validation at sub division
b) Secondary validation at Division and
c) Hydrological validation at SDPC adhering to HIS protocols. The software "SWDES" and "HYMOS" are mainly used for data entry and validation.

Project Completion Report(PCR)
Hydrology Project Phase-II(Credit No.4749-IN)
Surface Water Component, Andhra Pradesh

Back ground and Objective

The World Bank and Ministry of Water Resources, after reviewing the performance of Hydrology Project Phase-I, have called for new proposals for formulation of Hydrology Project Phase-II (vertical extension) with the financial aid from World Bank, wherein the Hydrological Information System developed under Hydrological Project-I and other data related to Surface Water would be used to address the problems in water sector planning and management by development of Decision Support System, Hydrological Design Aids proposed under Hydrological Project Phase-II.

As per the guidelines and Working Papers furnished by World Bank and the Ministry of Water Resources from time to time, the proposals for Hydrology Project Phase-II (vertical extension) are formulated with the prime objective of coordinated development and management of water, land and related resources to maximize social development and economic growth.

The Project Development Objective (PDO) will be extended to promote the sustained and effective use of the HIS by all potential users concerned with water resources planning and management, both public and private, thereby contributing to improved productivity and cost-effectiveness of water related investments in the 13 states and eight central agencies.

Implementation

The World Bank has cleared the Hydrology Project Phase –II (Surface Water Component) in Andhra Pradesh under I.B.R.D (International Bank for Reconstruction and development) loan No.4749-IN.The Government of Andhra Pradesh vide G.O.Ms No.31 I&CAD (Genl.IV)Dept dt.6-5-2006 has given administrative approval for Rs Rs.700.32 Lakhs (Base cost) / Rs.854.20 Lakhs (including Contengencies) for a period of Six years from 19.01.2006 to 28.02.2012. The project was proposed to be implemented in 13 states viz., Andhra Pradesh, Gujarat, Maharashtra, Karnataka, Kerala, Madhya Pradesh, Chattisgarh, Orissa, Tamil Nadu, Himachal Pradesh, Goa, Pondicherry, Punjab and 8 Central agencies viz., M.O.W.R., C.W.C., I.M.D., Central Ground Water Board (C.G.W.B.), National Institute of Hydrology (N.I.H.), Central Water and Power Research Station (C.W.P.R.S.), Central Pollution Control Board (C.P.C.B.) and Bhakra – Beas Management Board (B.B.M.B.). The overall responsibility for the project implementation will be with the M.O.W.R. and at the Central level,

the National Level Steering Committee chaired by Secretary, M.O.W.R. which in the apex body responsible for strategic supervision and policy support.

The Hydrology Project Phase-II has commenced from 5-4-2006. The original cost of the project is Rs.700.32 Lakhs with a project period of 6 years. The World bank Supervision mission(30 November – 7 December 2010) held on 02-12-2010 at Hyderabad and during Wrap up meeting on 7-12-2010 at New Delhi has suggested to upgrade the existing network established under HP-II and also establish additional G.D sites with Real Time Telemetry. Accordingly it was proposed to procure RTTS equipment for 216 Lakhs and corresponding civil works is 96.66 Lakhs. The project cost is revised to Rs 883.02 Lakhs and Government of Andhra Pradesh vide G.O.Rt No.960 I&CAD(GenI-IV.2) dt.22-9-2011 has accorded administrative approval. The HP Phase-II was extended by the World Bank up to May, 2014. The Loan closing date for HP-II project is 31 May 2014 and business closing date is 30 September 2014. The ratio of the lender share and state share is 78:22 respectively.

The proposed Hydrology Project Phase – II will build on and expand development of a comprehensive HIS (Hydrological Information System) improved access and promote extensive use of data among user departments, civil societies and other data users in the sector, thereby intensifying the use of HIS in effective and efficient water resources planning and management. The Project will implement activities towards improved planning and development of water resources to be adopted for Godavari Sub-basin (G5 Sub-Basin) on Pilot basis using Decision Support System and developing standardized design tools for estimating flood magnitudes, frequencies, flood routing and other hydrological studies using Hydrological Design Aids. Apart from these, Reservoir sedimentation studies of three reservoirs under Godavari basin and one reservoir under Krishna basin was done.

PROJECT MAIN COMPONENTS: -

Institutional strengthening:

- Procured 36nos computers and peripherals under up gradation of IT infrastructure.
- Procured GIS and Image processing software.
- As a part of Awareness Raising activity, 48 Workshops and 23 District level HDUG and 7 State level HDUG meetings were conducted to create Awareness among data users.
- Procured 5 LCD projectors and information Brochures got printed.
- Website for HP was developed and Website address is hp-apsw-cgg.gov.in.

- The Hydrology data is being disseminated to the users on demand.
- Study tour to Maharashtra State and Tamilnadu state was conducted.
- 484 Officers/ Staff were trained to improve capacity building by imparting trainings in various themes viz Basic Hydrology, Remote Sensing & GIS, Water quality, World Bank Procurement Procedures, Data base Administration and Visual Basic etc

Vertical Extension

i) Decision Support System

Development of Software model for Decision Support system planning (DSS-P) is one of the components of Hydrology Project Phase-II. Middle Godavari Basin (G-5), Sriram Sagar Project (SRSP) System was selected for model development.

The following scenarios are tested as part of the pilot study

a. Crop selection and corresponding water requirements:

This scenario tested for multiple cropping pattern in command area. Different combinations of crops are selected for optimum utilization of "available water level" in the reservoir during 1st October to 1st June. to assess the deficit of water under various cropping patterns.

b. Providing Water for all sectors based on Increasing Demands:

Effective allotment of water for various sectors (Drinking , Irrigation and industry) based on Increased demands has been tested to analyze the impact of increased demands of a particular sector on the remaining sectors

c. Combined Management of reservoirs and Water Transfers:

Integrated reservoir operation model setup completed and working on various possible test cases and results are yet to be analyzed.

d. Balancing Head-end and tail-end abstraction along irrigation canal

Conjunctive use of water has been tested in this scenario. Distributory-83(D-83) of SRSP catchment is selected as part of pilot study. Extending the scenario for more area in association with Ground Water department.

ii) Hydrological Design Aids(HDA)

The Central water commission has appointed M/s Consulting Engineering Services (India) private limited(CES) as the consultants for development of Hydrological Design Aids (Surface Water) and that contract were signed on November 18, 2009 and the consultants started the work from December 9, 2009.

Aim is to develop Hydrological Design Aids to improve upon current design practices and to standardize those practices for uniform use all over the country.

The terms of reference of the consultancy assignment include, following areas for developing HDA tools.

HDA 1: Assessment of Water Resources potential – Availability/yield Assessment.

HDA 2: Estimation of design flood. And

HDA 3: Sediment Rate Estimation.

The training programmes under HDA 1 and HDA 2 were completed.

iii) Purpose Driven Studies

Under Purpose Driven Studies, The Reservoir Sedimentation Studies of Four Reservoirs Kadam Narayana Reddy Project, Nizam sagar project, Priyadarshini Jurala Project and Sriram sagar Project were taken up by APERL (Andhra Pradesh Engineering Research Laboratories, Hyderabad). The Survey work and Report of Priyadarshini Jurala Project was completed.

According to Priyadarshini Jurala Project Survey report, the capacity of the Reservoir was reduced from 11.94 TMC to 9.657 TMC (i.e 19.125% Loss) . The Report Copies of Priyadarshini Jurala Project was submitted to Task Team Leader/World Bank and MoWR/NewDelhi, Chief Engineer(Projects), Mehaboobnagar and also to Superintending Engineer, Priyadarshini Jurala Dam Circle, Jurala for utilizing the report and based on results remedial measures to control the rate of sedimentation in the reservoir was also suggested . It is suggested to take up catchment area treatment as per the guidelines and go for construction of check dams and plantation to arrest soil erosion. It is also suggested to conduct Hydrographic surveys at frequent intervals i.e at least once in five years, as and when the reservoir attains FRL using the latest sophisticated surveying equipment (i.e., Integrated Boat Mounted Bathymetric System).

The SRSP Project report was also received from CE/APERL and it is found from the Hydrographic survey that the capacity of the project was reduced from 112 TMC to 80.104 TMC. The percentage loss in capacity is 28.48%.

The Survey work of Kadam Narayana Reddy Project and Nizam sagar is completed. The Report Preparation is under progress.

The reports of Kadam Narayana Reddy project, Nizam sagar project Reservoirs will be submitted soon after receiving the same from CE/APERL.

Project Coordination

Effective Project Co ordination between implementing agencies is important to achieve the predicted impact of the project. Co ordination is required to avoid duplication and unnecessary expenditure, follow quality control standards and procedures.

To achieve the effective coordination between implementing agencies the following committees at national level and State level are formulated.

I National Level

1. Steering committee(NLSC)
2. HISMG(Tech)

II State Level

1. Steering Committee(SLSC)
2. State Hydrological information System Coordination Committee(SHISCC)
3. Hydrological Data Users Group(HDUG)

I National Level

1) National Level Steering Committee (NLSC)

The Ministry of Water Resources(MoWR) vide their Lr.No.12/134/2006-B&B/89-146 dt.24.1.2007, have Reconstituted National Level Steering committee with 26 members from Seven Central level organizations viz., CWC, CGWB, CWPRS, IMD, NIH, CPCB, BBMB and from peninsular states, under the Chairmanship of Secretary, MoWR, New Delhi for implementation of the World bank assisted Hydrology Project Phase-II.

The functions of NLSC are

- To provide policy directions to the implementation of project.
- To exercise overall administrative and management control of Project.
- To review the financial progress of the project.

- To approve the constitution of the three management groups, HISMG(Tech), HISMG(IS&T) and HISMG(DD) set up for operational management of project on behalf of NLSC and periodically review of their functioning.
- To consider and approve any changes/ deviations to the planned programmes for project.
- To deliberate and ratify decisions not resolved at the level of the three HISMG.
- To oversee and review progress made in implementation of project.
- To resolve issues arising out of inter-agency coordination.
- Provide directions and support to State Level Steering Committees on policy matters related to project.
- To constitute special purpose working groups/ Task force to address specific aspects of the project as a time-bound activity with a clearly defined deliverable by engaging specialists from the academic/ industry, as required and
- To appoint experts to carry out an assessment of the effectiveness of HIS to provide Mid-course corrections, if any and define policies that are needed to keep the system responsive to operator needs for technological improvements.

The NLSC has met 2 times during the project period and reviewed the implementation of Hydrology Project.

II State Level

1) State Level Steering Committee (SLSC)

The Government of A.P vide G.O.Rt.NO.449 dt,13-05-2004 has constituted a State level Steering committee (SLSC) with Thirteen members under the Chairmanship of Secretary, I&CAD Department, GoAP for strategic, direction, Policy formulation, Project management and review the activities during the implementation of Hydrology Project phase-II.

The main functions of SLSC committee is

- To Monitor Physical and financial progress
- To determine slippage in respect of items on Critical path and suggest remedial /Corrective measures.
- To review conflicts in respect of detailed specifications, tender documents, tender evaluation etc.

- To consider changes/deviations to the planned programme for project, if any and where necessary refer to NLSC.
- To review the Annual Work Programme for Project.
- To review the activities of the specialist Task forces/Working groups.
- To resolve issues arising out of inter-agency co-ordination.

During the project period, the SLSC have met 7 times for review of implementation of project.

2) State Hydrological Information System Coordination Committee (SHISCC)

The Government of A.P vide G.O.Rt.NO.450 dt,13-05-2004 has constituted a State level Hydrological information system coordination committee (SHISCC) with Eight members under the Chairman ship of Chief Engineer,Hydrology, I&CAD Department, Hyderabad which will act as a project Secretariat and technical advisory body for state level Steering Committee.

The functions of the State HIS Co-Ordination committee is

- To Ensure effective co-ordination and exchange of information between the participating agencies, particularly between the State Surface Water and Ground Water Departments.
- To promote standardization in the process and formats of data collection, validation collation and analysis, to the extent possible.
- To facilitate the environment for seamless integration and free flow/exchange of Hydrology data and information between the State Surface Water and Ground Water agencies.
- To ensure compatibility of procedures, formats, protocols etc, between the central and state agencies and
- To promote special interest groups(SIG) in each State data centre to undertake Hydrological analysis, to publish the results of such projects and distributes, them widely, there by encouraging collected Ground water, Surface water and water quality specialists to conduct ongoing hydrologic analysis and publish their results.

The SHISCC have met 8 times during the project period and reviewed the implementation of Hydrology Project.

3) Hydrological Data Users Group (HDUG)

The Government of A.P vide G.O.Rt.NO.1384 I&CAD(Genl.IV.2) dept dt.12-12-2007 has reconstituted Hydrological data users group (HDUG) with Fifty One members under the Chairmanship of Secretary to Government , I&CAD Department, Hyderabad

Functions of HDUG

The main function of the Hydrological Data Users Group are as follows

1. Nature type, frequency and extent of data generally requested by various users.
2. Identification of the potentials and imitations of HIS by the members.
3. Awareness among institutions & individuals on HIS data availability & periodical review for upgrading HIS.
4. Consider the views & needs of data users in O&M of HIS.
5. Fixation of tariff structure for data dissemination based on the ability & willingness of the users to pay for the services.
6. Suggestions on users friendly form & feed back on improvements on service delivery.
7. Formulate task group, selected from the members group to carry on data needs assessment of the users at least once in a three years and updating HIN documents.
8. Assist in designing in data supply formats and suggests improvements and modifications as necessary from time to time.
9. Assist in conducting HIN interviews.
10. Provide feed back on the functional efficiency of HIS and suggests methods for enhancing scope and utility of data and
11. Participate in workshops, seminars, meetings and other forums of discussions to provide inputs for general improvements in service delivery.
12. To assist in identifying priority areas for the data collection, Management and dissemination through the data centers
13. Advise on type of services provided by the data centers.
14. Advise on format of reporting to make data dissemination user friendly and accessible.
15. Provide feed back on the practical use of data and on the data Quality.
16. Advise on charges for service in the data centre where applicable.

During the Project period 7 state Level HDUG meetings and 23 District level HDUG meetings were conducted.

Selection & Design and Procurement of Meteorological Stations:

Additional network consists of 25Nos. ARG/SRG stations and 4 Nos. F.C stations are proposed to be established under HP Phase-II for application of Decision support System(P).

Procurement of Equipment for ARG & FC stations was proposed in the procurement plan for 2007-2008. Based on the IMD officials suggestions the decision on detailed information regarding the network layout plan design for installation of instruments, list of suppliers and instrumentation was finalised.

Accordingly the administrative approval was sanctioned by Government for an amount of Rs. 8.45 lacs for procurement of meteorological equipment for establishing ARG and FC stations vide G.O.Rt.No.1394.

The World Bank communicated their "No Objection" for procurement of the equipment through National shopping.

Based on the recommendations of MoWR, a Purchase Order was placed on M/S SVS.Enterprises, Tanuku for supply of Equipment for ARG & FC Stations for an amount of Rs. 8,86,280 (Excluding Sales Tax). The equipment was installed at respective sites.

The list of stations is appended in Annexure-I

Civil works for Data collection Network

Preparation of Estimates:

The estimates for Civil works were prepared considering prevailing Standard Schedule of Rates at the time and sanction by the competent authorities.

All the Civil works are executed through force account procedures. The works contemplated under force account are executed by adopting the State Government Tendering procedures as per the instructions of the State level Procurement committee.

Lot of difficulties was faced during execution of the Civil works contemplated under force account as the value of works was very small and they are scattered in nature, spread over the entire state.

A list of Civil works executed is appended in Annexure-II

Procurement of Goods

The following procurements were done during Hydrology Project Phase - II.

A. UPGRADING INFRASTRUCTURE:

1. Upgrading IT hardware, Software and network capacities:

26 Nos. of desktop computers along with internal modem, **26** Nos. of MS office 2007 with one media kit, **26** Nos. of Norton Antivirus 2008, Software and **05** Nos. of Plain paper Fax machines have been procured for an amount of **Rs.13,58,084/-** vide purchase order No CE (Hydrology) SE(HP) /EE(HP)/ DEE3 /AEE1/HP2/ upgrading/HW&SW/550, dated,**23/09/2009** approved by CE Hydrology through DGS&D rate contract and installed successfully for use in circle office and division offices by M/S Prime computers, Sec-Bad.

2. Procurement of Laser printers and UPS:

26 Nos. of Laser printers and **26** Nos. of UPS have been procured for an amount of **Rs.5,21,834/-** vide purchase order NO.CE(Hydrology) /SE(HP) EE(HP) /DEE3/AEE1/HP2/upgrading/HW&SW/, dated 29/09/2009 approved by CE Hydrology through DGS&D rate contract and installed successfully for use in circle office. by M/S Prime computers, Sec-Bad.

3. Procurement of GIS software:

The GIS and Image processing software has been procured for an amount of **Rs.16,66,085/-** vide purchase order NO. CEHydrology) /DD (PD)/DEE /AEE /1049/08, dated **28/03/2011**, approved by CE Hydrology through Direct Contracting and installed successfully for use in circle office by NIIT GIS Limited.

4. Procurement of Computers on buy back basis:

10 Nos. of desk top computers along with MS office 2010 professional was been procured for an amount of **Rs.5,78,948/-** vide purchase order NO. 0701/HWP5/2011-2012, dated **31/01/2012** approved by CE Hydrology on buy back basis through APTS Ltd ,Hyderabad and installed successfully for use in circle office

5. Procurement of Office Furniture:

16 computer tables and 15 revolving chairs have been procured for an amount of **Rs.1,81,742/-** vide purchase order No. SE (HP) /EE(HP) /DEE3 /AEE1 /HP2/upgradation/furniture/961/A, dated 31/01/2012 for use in division, sub division offices and circle office through shopping procedures by M/S Anil Trading, Sec-Bad.

B PROCUREMENT UNDER DSS PLANNING:

1. Procurement of Database development goods:

07 Nos. of Laptops, 42 Nos. of Laptops accessories,07 Nos. of External Hard disk and 37 nos. of pendrives have been procured for an amount of **Rs.6,74,471/-** vide purchase order No. CE (Hydrology) /SE(HP)/EE(HP)/DEE3/AEE2/DSS- Laptop/326/2011/680, dated 28/09/2011 for use in circle office and division offices through DGS & D rate contract by M/S Cache Peripherals Pvt Ltd.

2. Procurement of IT Hardware for DSS Planning:

a) 01 No of Backup Tape library, 01 No of DSS Model tool computer ,04 Nos. of Antivirus Software, 01 No. of LAN, 04 Nos. of Racks for servers & UPS , have been procured for an amount of **Rs,12,28,605/-** vide P.ONoCE(Hydrology)/SE(HP)/EE(HP)/DEE3/AEE2/HP2/DSS/procurement/ , dated ,30/01/2012 , through local shopping procedures by M/S Cache Peripherals Pvt Ltd.

b) 02 Nos. of DSS Front end computer, , 01 No of DSS Web server computer, 01 No of Database server, 01 No of Backup Interface card,04 Nos. Of MS office, 01 No of Backup software, 02 Nos. of A4 Type Laser Printer, 02 Nos. of A3 Type laser printer, 02 Nos. of Online UPS for IT Applications(6KVA), 03 Nos. of Online UPS for IT Applications(1KVA),

have been procured for an amount of (Rs,16,72,033/- + Rs,34,125/-) **Rs,17,06,158/-** vide P.O No . CE (Hydrology) /SE(HP)/EE(HP)/DEE3/AEE2/HP2/DSS/procurement/, dated,30/12/2011, through DGS & D rate contract by M/S Cache Peripherals Pvt Ltd .

c) Firewall & electrical & networking items, have been procured for an amount of **Rs,1,33,361/-** vide P.O.No. CE (Hydrology)/SE (HP)/EE (HP)/DEE3 /AEE2/HP2/DSS/procurement/953, dated 30/01/2012,through local shopping by M/S Philip Suresh & Uday, Sec-Bad.

d) **02** Nos. of Split Air conditioner , have been procured for an amount of **Rs,87,500/-** vide P.O.No. CE (Hydrology)/ SE (HP) /EE (HP) /DEE3 /AEE2 /HP2 /DSS/procurement/,dated 02/05/2012, through local shopping procedures by M/S Comfort Air Solutions.

e) **01** No. of Internet leased line connection for WAN have been procured for an amount of **Rs, 8,41,648/-** vide P.O.No. CE (Hydrology) /SE(HP) /EE(HP)/DEE3/AEE2/HP2/DSS/procurement/955 dated 31/01/2012, towards IT Hardware for use in circle office and leased line in karimnagar division office through local shopping procedures by M/S BSNL.

The list of Procurement details are enclosed in Annexure III.

Procurement of Equipment for Upgrading Hydrological and Meterological Equipment for Real Time Telemetry System

The Government has accorded administrative approval for Procurement of equipment with Real Time Telemetry System for an amount of Rs.216 Lakhs for equipment and Rs.96.66 lakhs for civil works. 3ono.s of Gauge Discharge stations, 8no.s of DWLRS, 8no.s of AWLRS, 6no.s of F.Cs and 60 no.s of Rain Gauge stations are selected for upgradation and 10 no.s of additional G.D sites are also proposed to establish with Real Time Telemetry System. The IFB was issued for the above work, Six bids was received. All the bids are found to be non responsive. Further World bank communicated Aide Memoire vide E-Mail dt.18-11-2013 advised to drop RTTS activity as there is no sufficient time to re-bid the RTTS equipment.

Trainings

Need and achievement of training programmes in Hydrology Project

Training Activity is one of the main components of HP Phase-II for which the World Bank has provided an amount of Rs.53,67,000/. The primary

objective of training is to improve the staff capabilities of Hydrology project for collection and management of Hydrometric and water quality data and use of such data for water resources evaluation. The specialized training institutions such as CWC,NIH,CPCB,NWA,IIPA,Dr.MCRHRD,ESCI, ASCI are involved in the preparation and conducting of training courses to junior staff in general and specialized trainings such as advanced training courses in HYMOS in particular . Also training consultants employed to chalk out and review the training activities.

Government of Andhra Pradesh have accorded approval to the Annual Training Calendar (ATC) every year for conducting supplementary trainings on domain and software, Awareness raising activities and support to Data Users, Workshops and Study Tours (Local or National) and other trainings and workshops for organizational development, Hydrological Design Aids, DSS, etc.,

The organizational objective of Hydrological information systems for the benefit of stake holders, HDUG members, employees will be achieved through harnessing abilities and its people maximizing its potential and opportunities for development. Therefore it is necessary that there should be a match between organizing goals and attractive learning opportunities. The persons who have undergone trainings and given the teaching skills transfer to fellow employees in Department. A batch of 13 Trainers of Training (T.O.Ts) are created for conducting need based in House training for improving the skills of the employees.

In this project 484 Officers/ Staff have been trained to improve capacity building by imparting trainings in various themes viz Basic Hydrology, Remote Sensing & GIS, Water quality, World Bank Procurement Procedures, Data base Administration and Visual Basic etc

28 no.s of In house trainings are conducted under HP-II for the sustainability of the project round the year by the divisions as well as Circle office covering the network spread over entire state.

100 no.s of Domestic trainings conducted in various subjects such as Hydrological Data Collection, validation & management, Hydro meteorology, Hydrometry, Sedimentation analysis, Basic computer and data entry and Water

Quality and use of computer software specific to the Hydrology Project such as SWDES etc.,

The various trainings conducted at different training institutions are detailed below.

1. Basic course for Hydro meteorological observers.
2. Training for Hydro Meteorological supervisors
3. Sediment sampling and analysis
4. Basic computer and Data entry training
5. Basic/Advanced training in HYMOS
6. Trainer of trainings in Meteorological, Hydrometry, Water Quality and HYMOS.
7. Study Tours in India.
8. Hydrological Design Aids
9. Water quality management plan
10. Digital surface modeling and water shed modeling
11. Analysis toxic elements
12. Flood management and Flood Hydrology
13. Scripting and Dash board in decision support system for water Resources planning.

The above trainings were conducted at different Central Training Institutions i.e CWC, NWA, CPCB, IIPA, NWA, NIH and local training institutions such as WALAMTARI, APERL and Non-Govt. organizations like CMC, ESCI and Dr. MCR HRD

A training history containing seminars, workshops and in house trainings conducted in various disciplines during the project period i.e 2006-2014 is enclosed in Annexure-IV.

The training activity has resulted in improved quality of workmanship, integrated job development effectiveness in work and having in a common method of working.

The need based trainings from NIH, NWA and other institutions are given to the staff of on specific aspects of Hydrology such as computer application and introduction of relevant software like SWDES, HYMOS, WISDOM and HDA. In

addition to the above trainings are given in basic and advanced short term computer courses at local institutions like CMC and WALAMTARI.

Interagency Validation

The meteorological data up to December-2013 was sent to IMD. The IMD has furnished the validated data upto December-2010.

The Hydrological data was sent to CWC upto November 2013 as part of data exchange for validation. The CWC has submitted the data of all identified CWC stations up to May 2013.

Data Storage Center

Introduction:

Surface water data storage centre was established in Hyderabad, Andhra pradesh. The objectives and functions of the data storage centre (DSC) is as follows.

A. Objectives:

- To store and administer the validated data received from data processing centre
- To disseminate the available data to hydrological data users based on their request
- To disseminate the information of data availability or catalogue in state hydrology project website.

B. Functions:

- Periodic update of data
- Maintenance of database modules
- updating the Meta-data
- periodic reporting of status of data availability
- writing special queries for retrieving information from database
- Import / export data files upon request
- Conversion of HIS standard files into HIS data structure etc.

C. Facilities Available

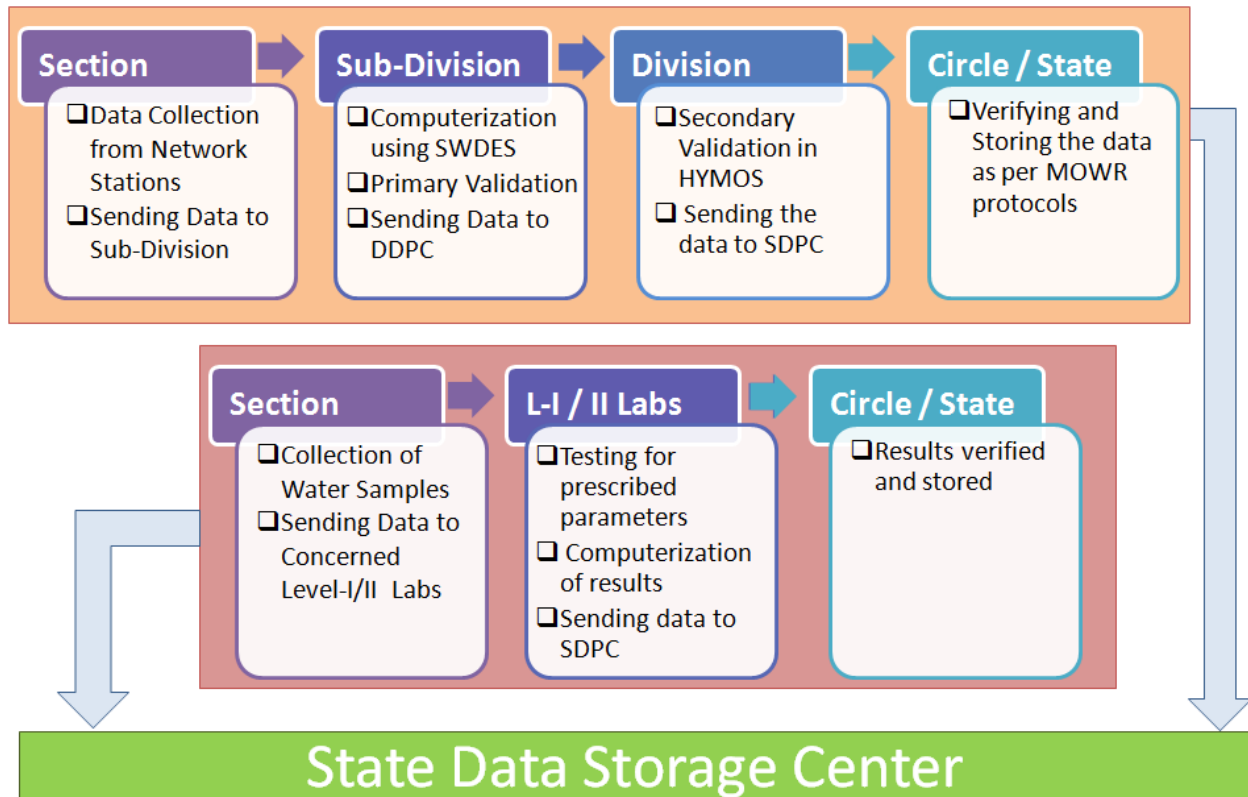
Hydrology project AP surface water consists of the following facilities spread across the state.

State Data Storage Centre	:	1
State Data processing Centre	:	1
District Data processing Centre	:	5
Sub Division Data processing Centre	:	14

District level and state level data storage centers were established with required number of computers with relevant software. The main software used to store the data is Surface Water Data Entry System (SWDES). It is a standalone application with MS access as backend.

D. Flow of Data from field to SDSC:

The flow of data from field to state data storage centre is illustrated below



E. Present Status:

Hydrology Project AP Surface water is currently using a dedicated software "SWDES V3.0" supplied by National surface water data centre, CWC, New Delhi. The data pertaining to Hydrology, Hydro-meteorological and Climatic station is available from July 1999 to January 2014 in Hydrology Project circle Data storage centre.

Specifications of hard ware and Software

The software should be standard, uniform and generic in nature.

The procurement of GIS Software was supplied by M/s NIIT GIS Limited, Hyderabad and successfully installed on 27/05/2011

- DSS Model tool computer

CPU - Intel Xeon processor E 5506, 2.66GHZ, 80W, 12M cache 5.86 GT/s QPI, DDR3 1066 MHz, HT Turbo

Memory –6 GB DDR3 800 MHz expandable to 48 GB with 6 DIMM slots and 8 GB DIMMs

Hard Disc Drive – 1000 GB, SATA HDD at 7200rpm upgradeable to 2 HDD.

- DSS Front end computer

CPU - Intel Core i5-650, 3.2 GHZ with Windows 7, 4MB L3 Cache, Memory - 2 GB 1066 MHZ DDR3 RAM expandable to 8 GB.

Hard Disc Drive - 320 GB 7200rpm Serial ATA HDD

- DSS WEB SERVER

CPU - Intel Xeon E 5506, 2.13 GHZ, 4MB L3 Cache, 800 MHz Qpi Bus Memory – 2 x 1GB 1067/1333 MHZ DDR3 RAM expandable to 24GB.

Hard Disc Drive – 3 x 146 GB, 10000rpm SAS

- DSS DATABASE SERVER

CPU - Intel Xeon E 5506, 2.13 GHZ, 4MB L3 Cache, 800 MHz Qpi Bus Memory – 2 x 1GB 1067/1333 MHZ DDR3 RAM expandable to 24GB.

Hard Disc Drive – 3 x 146 GB, 10000rpm SAS

- BACKUP Tape Library

Tape Drive Technology - LTO 4 800GB/1600 GB Native Compressed capacity, PC with min 24 slots.

- BACKUP Interface Card

HBA Single Port Fibre Channel for Win2003/ Linux.

- Procurement of GIS and Image processing software

Arc GIS, Arc Info V10 on Windows, Arc GIS Spatial Analyst Extension.

Dissemination data and application of HIS:

The data is disseminated from state data storage center through SWDES database upon the request of the users. The availability of data is distributed on request to the State / Central and other authorized Hydrological Data Users. As per the recommendation of the state Hydrological Information Systems coordination committee (SHISCC), a data pricing policy was developed for Andhra Pradesh surface water.

The Government of AP vide GO Rt No 508 I&CAD (General IV.2) Dept. Dt: 14-05-2007 have issued orders for implementation of collection of user charges for the data dissemination of Surface Water.

The pricing structure is being adopted as follows.

1. Gauge Discharge Data : Rs. 400/- per station per year
2. Sedimentation Data : Rs. 400/-per stations per year
3. Water Quality Data : Rs. 160/-per station per year
4. Rainfall Data : Rs. 0.55 per Record
5. FCS Data : Rs. 150/-per station per parameter per year

The rates mentioned above shall be charged to the categories in the following manner:

Cat-a):- The price structure is applicable for all Government Departments.

Cat-b):- For Non-Governmental organizations /individual, double the above rates shall be charged.

Cat-c): - For students, Elected representatives and Research organizations half of the rates shall be charged

In addition to the above Government order dated 26-6-09 provides for advance dissemination of data to the data users of I & CAD Dept and collect user charges later

After implementation of pricing structure the data Disseminated to various government, N.G.O. and private organization Covering university scholars and P.G. Students, Irrigation, A.P Genco, WAPCOS and other private organization for utilization for different purposes (Irrigation/Industry/consultancy). A snapshot of HIS data usage given below

Agencies	Type of data Requested	Purpose for which Intended
Government Organizations	G.D Data & Rainfall Data	Assessment of yields Disaster management Power potential studies Drought studies Design of Irrigation structures Assess flow in minor tanks etc

Research Scholars / Institutions	Water Quality, GD Data and Rainfall Data	For various dissertations like Rainfall and runoff model Impacts of meso scale watershed development in Andhra Pradesh Water Quality Trends assessment
Private Organizations	G.D Data Rainfall Data and Project Data	Implementation of hazard mitigation project To develop integrated water resources management system

The total no of purchasers from 2008 to till date are 15 nos and the amount received so far is Rs.1,36,794/-

Lessons Learned

- Displacement of trained technical personal on the administrative grounds has hampered the technical sustainability of the project to some extent. Therefore necessary steps being taken up by Government to curtail this practice.
- Recruiting or outsourcing IT experts for managing the data storage servers and advanced computer systems and softwares for processing. Dissemination and storing of Hydrological and water Quality data.
- Dearth of HIS staff and chemists is affecting the collection of Hydro meteorological and Water Quality data. A permanent solution should be sought for to overcome this.
- No objections and clearances should be issued in an accelerated manner for various procurements to avoid time delay.
- MoU's should be entered if any components / works has to be got it done with officers or organizations other than the implementing agency duly fixing time frame.
- Delay in appointment of Consultants delayed the progress.
- Regular monitoring and visits to Implementing Agencies by consultants will be speed up the activities.

Sd/-D.Rama Krishna dt16.8.2014
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