

## **A Brief Report on the areas in which WAPCOS is working to promote the principles of GLOBAL COMPACT SUMMIT**

### **About WAPCOS**

Water and Power Consultancy Services (India) Limited - WAPCOS – WAPCOS is a “**MINI RATNA**” and “**ISO 2000**” accredited Public Sector Enterprise under the aegis of the Union Ministry of Water Resources, Government of India. Incorporated on June 26<sup>th</sup>, 1969 under the Companies Act, 1956, WAPCOS has been providing consultancy services in all facets of Water Resources, Power and Infrastructure Development in India and Abroad. Since its inception, the performance of the company has been steadily growing and promising. WAPCOS in terms of growth in its overall business and profitability has been rated as “**Excellent**” by the Department of Public Enterprises, continuously for 11 years and has been awarded **Prime Minister’s MOU Award for “Excellence”** for the year 1998-1999. WAPCOS is ranked amongst the **top 10 PSEs** for the year 1999-2000 and has been awarded the ‘**Merit Certificate**’ for “**Excellent**” performance during 1999-2000 and 2000-2001 by the **Hon’ble Vice President of India**. WAPCOS also received merit certificate for “**Excellence**” for the year 2001-2002 from **His Excellency President of India**.

WAPCOS’ spectrum covers a wide range of activities e.g. pre-feasibility studies, feasibility studies, field investigations, detailed engineering including designs, detailed specifications, tendering process, contract and construction management, commissioning and testing, operation and maintenance, quality assurance & management and human resources development.

WAPCOS had also been associated in the preparation of 10<sup>th</sup> Five Year Plan of Govt. of India and acted as Member of various Committees constituted by Planning Commission. WAPCOS has made a niche within the Ministry of Water Resources & Ministry of Rural Development, Government of India and deliberates` on technical matters, national policy issues, way forward approach to irrigation & drainage and privatisation issues on the subject.

WAPCOS is **registered with various international funding agencies** like African Development Bank, Arab Bank of Economic Development in Africa, Arab Fund for Economic and Social Development, Kuwait, Asian Development Bank, Food and Agriculture Organisation. World Bank/International Bank for Reconstruction and Development, International Fund for Agricultural Development, United Nations Development Program, United Nations Organisation, World Health Organisation, West African Development Bank, Indian Technical and Economic Co-operation (ITEC) Programme, Overseas Economic Co-operation Fund etc. Apart from Indian sub-continent, WAPCOS has been **operating in over 35 developing countries** and is currently engaged in providing consultancy services in Bhutan, Ethiopia, Mauritius, Cambodia, Afghanistan and Zimbabwe. In addition to its core team of professionals WAPCOS also utilises its in built capacity to draw upon and mobilise the in-service expertise from various central and state government organisations.

**Areas in which WAPCOS is working to promote the principles of Global Compact  
(in accordance with the 9 principles)**

**HUMAN RIGHTS**

*The principles on Human Rights are:*

*Principle 1*

*Businesses are asked to support and respect the protection of international human rights within their sphere of influence; and*

*Principle 2*

*Make sure their own corporations are not complicit in human rights abuses.*

**Areas in which WAPCOS is working to promote the principles are:**

- Socio-economic Impact Assessment Studies of Developmental Projects for Central and State Governments, and also for Private agencies
- Rehabilitation & Resettlement Studies carried out for Developmental/Infrastructure Projects
- Measures for Improvement of living conditions (Economic & Social) of the Project Affected Persons, keeping in view the interests of economically backward, backward & tribal communities, women and children
- Ensuring People's Participation through Workshops, Training programs, Field visits, Public Hearings, etc.
- Watershed Development Programs, Water Harvesting, Water Quality Monitoring, Information, Education and Communication
- Identification of sources for Safe Drinking Water for remote/under-developed areas
- Command Area Development Programs, Design & Development of Irrigation Schemes, Consultancy for change in Cropping pattern towards economic upliftment of farmers, etc.

**Examples of Recently Completed/Ongoing Projects**

• **Godavari Lift Irrigation Schemes, Andhra Pradesh, India**

Services included design and feasibility study for a water conductor system to provide Irrigation and Drinking Water to the drought prone Telangana region in Andhra Pradesh. Technical and economical feasibility of the scheme were analysed for the alignment of the conductor system, and the command area. The Cropping pattern in the Command Area was studied and changes in cropping pattern were suggested to improve the economic condition of the people. Use of GIS and Remote sensing tools was made for the environment and socio-economic impact assessment of the project.

- **Socio-Economic and Water Services Base Line Survey for Haryana Irrigation Department, India**

The main objective of this World Bank funded study was to carry out the socio-economic and water services base line surveys which will provide Haryana Irrigation Department insight into the situation in the initial phases of Water Resources Development and form the basis for future monitoring and evaluation of project impacts.

- **Integrated Watershed Management in Yamuna and Chambal Catchments, India**

The project objective was to evolve an integrated watershed management plan comprising land use pattern, ground water development, water disposal structures, forestry, construction of chak roads, logistics etc. The services rendered include evolving a computerised system for physical and financial monitoring, report generation, database management, field sample surveys, cropping pattern, cropping intensity, agronomical practices, crop production, pre and post project socio-agro-economic analysis.

- **Monitoring & Evaluation of Uttar Pradesh Sodic Land Reclamation Project, Phase II (UPSLRP II)**

The UPSLRP II, a World Bank funded project envisages to reclaim 1,50,000 ha of Sodic Affected Soils in 11 Districts. The main development objectives of the project is sustainable reclamation of sodic lands and prevention of further increase in sodicity in selected districts of the state. The project would contribute significantly to poverty alleviation in these areas and would also ensure more sustainable management of natural resources in future based on strong beneficiary farmer participation. Special attention is being paid to the needs of women and children.

- **Agro-Socio-Economic Survey Study of Mahi Bajaj Sagar Project, Rajasthan, India**

The scope of the study included cropping pattern, crop production, credit, input availability and economic impact of the project, analysis and evaluation of agro-socio-economic conditions, existing level of income & employment of the households in Cultivable Command Area (CCA) & non-CCA was carried out. The findings revealed that irrigation has substantial impact on the production, income and standard of living of the people in the command area.

- **Evaluation Studies for Command Area Development (CAD) Programme for Jamuna Irrigation Project (Assam), Chambal Irrigation Project (Rajasthan),**

**Mayurakshi Irrigation Project (West Bengal), Surya Irrigation Project (Maharashtra), J.L.N. Irrigation Project (Haryana), India**

The study included sample survey of project area, critical evaluation of water availability in the system, physical system of irrigation and drainage, socio-agro-economic environment of the project area, water management, agricultural practices & crop productivity, welfare analysis, employment pattern, infrastructure facilities, environmental aspects, status of maintenance, organisational review, post project economic evaluation with and without CAD conditions and detailed recommendations on the basis of the study.

- **Preparation of Watershed Development Plan Phase 1 in Rajasthan, India**

The study involved the Topographical grid survey, Socio-economic baseline survey, Soil survey and Participatory Rural Appraisal (PRA), data collection, analysis and interpretation, preparation of Management Plan and reports for the Watershed Development Project. About 30 detailed management plans for 30,000 ha. have been prepared for watersheds.

- **Poverty Alleviation through forestry activities in Orissa and Bihar, India**

The services included poverty alleviation and community development programmes. The main objective of the study was to improve the conditions of the schedule tribes and castes living in forest areas and to reduce the ecological degradation of forests.

- **Planning & Designing of water supply system for Dwarka Residential Area, Development by DDA, Delhi, India**

Detailed planning and design of the water distribution system for an area of 3550 ha. of phase-I and 2100 ha. of Phase-II was carried out under Dwarka Residential project to cater to a population of one million under Delhi Municipal Area.

- **Water Supply Scheme for Manori, Gorai and Kulvem village the Greater Bombay and for various other districts of Maharashtra, India**

**There exists extreme shortage of potable water to the residents of 3 Island Villages Gorai, Manori & Kulvem in Greater Bombay.** There is no piped water supply system by sea and the area contains 8 small lakes. The consultancy included review of census and other data available, review and analysis of data, detailed topographical survey and geo-technical tests. **The water requirement as per population projection was ascertained and water availability from surface and ground water source was matched with the projected requirement.**

- **Preparation of DPR for abatement of pollution in river Mahanadi & Kathajori at Cuttack & river Brahmani at Talcher (Orissa), India**

The consultancy services provided were in respect of:

- Identification of point and non-point source of pollution
- Assessment of wastewater flows, study of the existing of sewerage and drainage system.
- Selection of treatment process after study of waste water characteristics
- Design of effluent disposal system.
- Identification of the areas requiring low cost sanitation facilities and preparation of design, cost estimate thereof.
- Identification of locations for crematoria, including cost estimates.

- **Detailed Project Report for Water Supply Schemes under Master Plan Phase-II for Greater Jammu, India**

The project was carried out for provision of water to the people in the troubled state of Jammu & Kashmir. The Detailed Project Report (DPR) covering design of all components like intake, rising main pumping stations, trunk transmission line, water treatment plant, primary distribution network of all zones and peripheral works like population forecast, water demand (2021), water sample analysis, assessment of water availability, arrangements for sludge disposal etc was prepared.

- **A Follow up mini survey of families settled in the Indira Gandhi Nahar Project, India**

The objectives of the study were to ascertain changes in the socio-economic status of settler families over the period of settlement, contribution made by various factors, in particular that of World Food Programme's free ration & interest free loans from the revolving fund, average time needed to achieve a level of self sustenance i.e. to move above poverty line and to ascertain the nature of problems faced by the settler families.

- **Watershed Development and Afforestation, Assessment of Infrastructure Development in U.P., India**

Services included Examination of quality of construction, technical advice, construction, assessment of cost on works, preparation of plan & estimate including construction supervision. The involvement of community especially women in decision-making were also stated.

- **Monitoring and Evaluation of Rural Water Supply Schemes, Maharashtra and Karnataka, India.**

The Rajiv Gandhi National Drinking Water Mission funded project consisted of Examination of Socio-economic status of villages, present coverage status specially in backward/SC and ST areas, working status of scheme, operation and

maintenance status, community participation in respect of capital cost sharing and O&M, sustainability users, working trends of implementing agency, water quality problem & rural sanitation.

- **Rural Development in the Upper Krishna Basin Command Area, Karnataka, India**

The Project consisted of Command Area Development (CAD) Planning, Designing, Selection, Implementation and Monitoring of CAD work and estimation of their costs. The selection of works for rural development carried out keeping in view the social, cultural, industrial, economical and environmental aspects and the needs of the people of the area in terms of infrastructure was also done.

- **Socio-economic Baseline Survey of Upper Ganga Irr. Modernisation Project area of Uttar Pradesh**

The services provided were collection of Demographic and Socio-economic Baseline Survey data of two distribution system covering 2400 households adopting multistage stratified random sampling technique. The conditions in CCA & non-CCA areas were near about similar as in CCA the canal water was insufficient for irrigation and non-CCA farmers were using assured supply of ground water. The study included the socio-economic aspects, cropping pattern, cropping intensity, agro-nomical practices, crop production and infrastructural facilities. The likely impacts of the modernisation project were also analysed.

## ENVIRONMENT

*The principles on Environment are:*

*Principle 7*

*Businesses are asked to support a precautionary approach to environmental challenges;*

*Principle 8*

*undertake initiatives to promote greater environmental responsibility; and*

*Principle 9*

*encourage the development and diffusion of environmentally friendly technologies.*

**Areas in which WAPCOS is working to promote the principles are:**

- **WAPCOS has a separate Centre for Environment, which has carried out more than 150 Environmental Impact Assessment (EIA) and Socio-economic Impact Assessment (SEIA) studies. The studies included:**
  - Environmental Impact Assessment Studies for Developmental Projects (Hydroelectric projects, Transmission lines, Port development, Mining, Canals, Command Area development, Catchment Area Treatment, Lakes, Industries, Thermal power projects, etc.)
  - Suggesting Mitigation measures for minimizing Environmental Impacts
  - Suggesting New Technology for Sustainable Development
  - Suggesting Alternate sites/ design, such that Environmental affects can be minimised
  - Use of Innovative Technology like Satellite data, Geographical Information System (GIS) tools for Assessment of Environmental & Social impacts of Developmental projects (to ensure use of latest & accurate data & also to induce transparency to clients, public)

**Examples of Action (Some Important Environmental, Socio-economic, Catchment Area Treatment Projects Completed Recently /Ongoing)**

- **Preparation of Catchment Area Treatment (CAT) Plan for Kol Dam Hydro electric project, Himachal Pradesh, India**

A study was conducted for the directly draining catchment area of the proposed project. Soil data, Landuse map of the area (prepared using satellite data), Meteorological data , other published data were used to assess the soil loss in the catchment area using Universal Soil Loss Equation (USLE). **GIS layers for each data layer were overlaid to derive the vulnerability of the area.** These results were then used to formulate a Catchment area Management Plan, including the cost and time required for implementation of the Management Plan.

- **Environmental Impact Assessment (EIA) study for Hirakud B and Chiplima B Hydro electric project, Orrissa, India**

The EIA study covered collection on baseline data on environmental project ecological survey and rehabilitation and resettlement Plan for Project affected persons. Prediction and assessment of impact on water quality, ecology and socio-economics were made. The critical parameters were identified and Mitigatory measures were chalked out. Environmental Planning was also done and Predictions made to represent future scenarios, which help the management in decision-making process. Preparation of Environmental Management Plan (EMP) and Disaster Management Plan (DMP) and Post Project monitoring Programme was done.

- **R & R plan of Dhaleswari dam project, Mizoram & R&R Plan of Subansiri dam Project, Arunachal Pradesh, India**

A detailed Socio-economic study was carried at the project affected villages and a suitable Rehabilitation & Resettlement (R&R) plan suggested. For socio-economic survey in the project-affected areas, a detailed questionnaire was designed and tested before actually carrying out the survey in the field. All the data generated and collected was then used in various permutations and combinations and based on certain environmental indices, the critical parameters were identified and mitigatory measures chalked out. Environmental Planning was also done and Predictions made to represent future scenarios, which helped the management in decision-making process. A suitable compensatory afforestation plan with the help of satellite imagery was also suggested.

- **EIA study for the proposed Jetty and food processing plant, Okha, Gujarat, India**

The study envisages, collection of baseline information, prediction of impacts and preparation of Management Plan to ameliorate adverse impacts on Environment. The project also envisaged formulation of a post-project monitoring programme and Disaster Management Plan (DMP). As a part of the study, a new alignment of the Railway line was proposed for transportation of the raw material with minimum dislocation of the settlements of Okha Village. A detailed marine ecological study was carried out to evaluate the impact of the proposed project on the Marine Organisms. The work involved ascertaining the environmental baseline status through the data collected from various primary and secondary sources.

- **EIA Study for Kuriarkutty-Karparra Multi-purpose scheme, Kerala, India**

The services include collection of baseline data, forecasting of impacts to identify the negative as well as positive impacts. An ecological study of the submergence area in the periphery of Parambikulam wild life sanctuary was carried out to identify the impacts on this sanctuary due to the proposed project. The critical parameters were identified and mitigatory measures were chalked out based on certain environmental indices.



Environmental Planning was also done and predictions were made to represent future scenarios, which help the management in decision-making process. **A dam break study was carried out for Karaparra dam and a suitable disaster management plan was suggested. Environmental Monitoring programme for effective implementations was also suggested.**

- **EIA Study and Socio Economic Bench Mark study for Sankosh Multi-purpose project, Bhutan**

The study covers environmental impact assessment, Environmental Management plan, Dam Break Study, Disaster Management Plan and socio-economic and resettlement study for the oustees. A detailed study was carried out at Buxa Tiger Reserve to identify the impact of the proposed canal, which will be passing through this reserve. The path of the proposed canal was identified and plotted using GIS tools and overlay techniques. As a part of the management plan we have suggested management measures to minimize the impact in the Elephant pathway.

- **EIA and Socio Economic studies for Madikheda Project, India**

The proposed EIA Study aimed to assess both the positive as well as negative impacts on the environmental and socio-economic aspects. EMP was suggested to ameliorate the adverse impacts. A detailed socio-economic study for the Project Affected Families (PAFs) of the submergence area was conducted. A detailed ecological survey was carried out in the submergible area, which was coming under the Madhav National Park to understand the ecological impact due to this proposed project.

- **EIA Study for Srinagar Hydro-electric Project, India**

As a part of the EIA study, a detailed study was undertaken to assess the impacts on various aspects of environment due to the construction of the project. The impacts studied were displacement of population due to acquisition of private lands, and relocation of temple etc.

- **EIA Study of Water Sector in Punjab Multi purpose projects**

The objective of the study was to evaluate environmental and related socio implication due to the development of water resources sector in the State of Punjab. The EIA is aimed to recognize all environmental consequences early in the project cycle and take them into account in project site selection, planning and design stages.

## **PARTNERSHIP PROJECTS/Projects funded by International organisations**

*The Global Compact encourages companies to participate in partnership projects with UN agencies and civil-society organizations that are aligned with UN development goals.*

***WAPCOS is working in many Under-developed/ Conflict affected Regions, like Yemen, Cambodia, Afghanistan, Zimbabwe, Bhutan, Ethiopia and Eritrea.*** The Company is participating in many projects with UN/International Organisations/Agencies/Civil Society Organisations in alignment with UN goals. Some examples of such projects are:

- **Laboos Area Water Supply Project**

The project caters to supply of drinking water for a population of 50,000 persons in 101 villages in the Laboos plateau. The water supply to the villages is 60% through public stand posts and 40% through individual house connections and the entire supply is being metered and charged to the consumers.

- **Exploration and Tapping of Potable Ground Water Resources in Namibia**

This turnkey technical assistance project under the Africa Fund aims at exploration and tapping of potable groundwater resources for rural water supply in the Eastern Caprivi in Namibia

- **Preparation of Master Plan for Ethiopia Valley Development Study Agency (EVDSA)**

A Memorandum of Understanding (MOU) on mutual cooperation in the economic field was signed in December 1985 between the Governments of Ethiopia and India to bring out the Master Plan of Water Resource Development in the entire country of Ethiopia. WAPCOS was commissioned by the Ministry of External Affairs, India to implement the project with Ethiopia Valley Development Study Agency (EVDSA).

- **Studies on Ejersa and Sewir Projects in Ethiopia**

These studies were taken up to study and prepare a design report for Ejersa Irrigation Project and for preliminary design report of Sewir Irrigation Project in Ethiopia. The studies involved complete hydrological analysis, engineering design, command area planning and designs, economics, irrigation scheduling, socio-economic, infrastructural and other studies necessary for development of the project. Custom designed software, were extensively used in the hydrological and water resources planning, water management studies, and design of dam & appurtenant works.

- **WRDA Phase-I Project, Ethiopia under ITEC Programme of Govt. of India**

This project was carried out for Water Resources Development Authority (WRDA), Addis Ababa. WAPCOS made detailed technical appraisal of reports of 16 ongoing and new schemes under various programmes of development and prepared manuals to facilitate start of the projects. Work included review of the capabilities of WRDA in the fields of (a) Water Resources Design (b) Project Construction Supervision (c) Project Operation & Management and giving recommendations for strengthening the institution (d) Training for transfer of technology to Ethiopian counterparts.

- **Preliminary Water Resources Development Master Plan for Ethiopia (EVDSA) under ITEC Programme of Govt. of India**

Ethiopian Valleys Development Studies Authority (EVDSA), Addis Ababa awarded the work to WAPCOS for preparation of final report on Water Resources Development Master Plan for Ethiopia in 10 volumes. The report covered all the major basins and identified (a) 61 major irrigation schemes having a potential of 3.27 million ha (b) 26 medium irrigation schemes having a potential of 0.18 million ha (c) large number of minor irrigation schemes for a potential of 0.18 million ha. Economic matrix was formulated giving prioritisation for implementation.

- **Sedawgyi Multipurpose Project, Myanmar**

The project consists of an earthen storage dam (40 meter high) with concrete spillway and power house with an installed capacity of 25 MW and Canal systems, to irrigate a culturable command area of 51,400 ha out of which 5,700 ha are to be irrigated by drawing water from the Mandalay main canal and pumping it through three pumping stations into canal system and for increasing water supply to the Mandalay city.

- **Khanabad Irrigation Project, Afghanistan**

The project is a part of the programme for modernisation of the existing irrigation system in the Khanabad valley by construction of a diversion weir across Khanabad river and construction of main and link canals with control structures for providing irrigation to an area of 30,000 ha. Scope of Services included detailed examination of the problems prevailing in the project area, preparation of designs and tender documents for the construction of a barrage and main canals on either bank and providing construction supervision.

- **UDA Walawe Project, Sri Lanka**

Uda Walawe reservoir with a live storage of 2,03,522 acre-feet has been formed on the completion of the dam in 1967. The project envisaged land development for irrigation on either bank of the Walawe river excluding the south Central part of the river basin which

was already developed. It was proposed to have one main canal each on either bank to supply water to field for irrigating 81,000 ha.

- **Amarah Irrigation and Drainage Project, Iraq.**

**Amarah Irrigation Project** comprised of design of diversion barrages, irrigation canal systems and drainage system for integrated agriculture development for 218,000 ha in the Lower Tigris basin. The scope of service included Installation, operation and maintenance of meteorological stations in project area.

- **Kifil Shinafiya Irrigation and Drainage Project, Iraq (Planning Stage)**

The works proposed for the development of the project area comprising of five new barrages and eleven main canal systems along with a drainage network, which includes two evaporation basins as well

- **Kifil Shinafiya Irrigation & Drainage Project (Phase II), Iraq**

The project consists of river diversion structures and Macro and Micro canalisation with proper irrigation and drainage for development of irrigation in Kifil Shinafiya Region of Iraq. Scope of Services included hydrological surveys, topographic surveys, soil surveys for development of Kifil Shinafiya Region.

- **Lower Helmand Valley Development Project, Afghanistan**

Lower Helmand Valley Development Project consists of main storage dam near Rodbare is a 4,000 m long 40 m high earth dam with two canals, one from either bank. The Scope of Services included planning studies of the river basin as a whole, feasibility studies of the storage and diversion dams and the different canal systems. The assignment covers studies of the basin characteristics, hydro-meteorological, topographical and soil data for development of this largest river system in Afghanistan for providing irrigation to an area of 250,000 ha. and generation of 50 MW Power.

- **Feasibility Study and Final Designs for Te Small Irrigation Schemes and Investigation of additional sites in Taiz, Yemen**

Scope of work included topographical surveys, geological surveys and geo-technical investigation, hydrological and soil surveys, socio-economic surveys cost estimation, preparation of tender documents assessment of agriculture development, design of the various engineering components and feasibility grade engineering drawings, implementation schedule, economic analysis of the project, crop water requirement and evaluation of project efficiency, preparation of feasibility report etc.

- **Six Irrigation Schemes in SURDU Project, Republic of Yemen**

The consultancy services included carrying out planning, field investigation, survey, design and drawings for six irrigation schemes, including the rehabilitation of ancient dams in SURDU Project area. Services also included field reconnaissance, establishment of hydrological and hydro-meteorological stations and identification of dam site of Wadi Bana.

- **First Mindanao River Valley Project Studies, Philippines**

WAPCOS provided services for complete feasibility studies, for four high priority projects. Besides, planning for the usual irrigation and related facilities, studies also covered problems of flood, drainage congestion, inadequacy of river flows, large scale sedimentation, soil conservation, watershed management, bank erosion, water losses in canals, water borne diseases, inadequacy of rural infrastructures, cropping pattern, highly inadequate communication system, agricultural practices and socio-economic aspects and operation and maintenance guidelines.

- **Amibara River Valley Project, Phase-II, Ethiopia**

The project was awarded by Water Resources Development Authority, Govt. of Ethiopia and funded by African Development Bank. The services included Survey, Soil Investigation, Irrigation & Drainage Requirements, Water Management Studies, Hydrological and Hydro-geological studies, On-farm Development Studies, Detailed Engineering Designs of Drainage Works, Environmental Impact Assessment Studies, Cost Estimates, Implementation Schedules, Tender Documents, Economic and Financial Analysis.

- **Warsej Project, Afghanistan.**

Work included undertaking feasibility studies for the development of 27,000 hectares of Taloqan area from Warsej reservoir, soil conservation, topographic and geological exploration, planning, design, cost estimation of various works to achieve the above objective and cost-benefit assessment of such works with recommendations for desirable farm sizes and budgets.

- **Massingir Dam Rehabilitation Study, Mozambique**

The assignment involved undertaking feasibility studies for rehabilitation of 46m high zoned earth fill dam suffering from heavy seepage through foundations. Services included review of geological and geo-technical data, studies and design of alternative rehabilitation measures, preparation of tender documents for civil works and review of hydro-power station designs and tender documents. Seepage analysis and dam stability calculations envisage application of FBM analytical models.

- **Rehabilitation of Salma Dam, Khanabad Irrigation Project, Quarsh & Amir Ghazi and Seven Micro Hydel Schemes in Afghanistan.**

WAPCOS is presently involved in carrying out Rehabilitation study of above said projects in Afghanistan for Ministry of External Affairs, (MEA), Govt. of India under Reconstruction Programme of Afghanistan. The scope of service included detailed topographic survey, planning, Detailed design, cost estimate, tender documentation etc. Detailed feasibility report is under progress.

- **Mak Nao Lift Irrigation scheme, Laos**

The assignment involved undertaking feasibility studies, survey investigations, agricultural studies, detailed engineering design, construction drawings and cost estimate.

- **Kao Lio Irrigation Project, Laos**

The assignment involved undertaking feasibility studies, survey investigations, technical assistance, agricultural studies, detailed engineering design, construction drawings and cost estimate.

- **Water Resources Development Project, Laos**

The assignment involved undertaking feasibility studies, survey investigations, technical assistance, agricultural studies, detailed engineering design, construction drawings and cost estimate.

- **Small Scale Irrigation Project, Laos**

The assignment involved undertaking feasibility studies, survey investigations, technical assistance, agricultural studies, detailed engineering design, construction drawings and cost estimate.

- **Four Dams Project, Ministry of Hydraulic Resources, Vietnam**

The assignment involved undertaking feasibility studies, survey investigations, technical assistance, agricultural studies, detailed engineering design, construction drawings and cost estimate.

- **Dau Tieng Project, Vietnam (World Bank funded project)**

The assignment involved undertaking feasibility studies, survey investigations, technical assistance, agricultural studies, detailed engineering design, construction drawings and cost estimate.

- **Rural Electrification Master Plan study of Zimbabwe**

The objective of the project is to provide power supply to the rural service centres in Zimbabwe. WAPCOS prepared the Master Plan Document on Rural Electrification of Zimbabwe upto the horizon year 2010. The Master Plan Document is on the anvil for

implementation. It has been expanded with the inclusion of infrastructure development like water supply, irrigation, energy intensive cottage industries for the overall economic development of the rural areas in Zimbabwe.

- **West Barai Irrigation Project, Cambodia**

The Project consists of review of hydrology and assessment of rehabilitation work required. It also consisted of Assessment of Command Area Development required. Long-term sustainability of the project. e.g. watershed development and management and regulation of human activity in and around reservoir are being studied. The examination of the possibility of using water for various other commercial purposes viz. fisheries, dairy & poultry farming, water-based industries etc. is being done. HRD Training will be given to Engineers / Farmers Water User's association will be set up as a part of the project. Environmental safeguards will be suggested

- **Wabi Shebele River Project, Ethiopia**

The study is to evaluate and suggest measures for development of the valley. It consists of soil and land evaluation, evaluation of livestock production, study of hydrology and hydrogeology, irrigation and drainage, environmental impact assessment, hydro power development and suggestion of improvements in water supply and sanitation facilities.

- **Hydro-Power Development in Bhutan**

WAPCOS is involved in Hydro-Power and Transmission Projects in Bhutan for more than 25 years. It has been Consultant for Preparation of DPR and Detailed Design Engineering including Infrastructure Development for 5 Major Hydroelectric Power Projects with an installed capacity of more than 2500 MW. It has also provided services for 9 Transmission line Projects upto 400 KV level and associated sub-stations. **It has recently been awarded consultancy services for preparation of Detailed Project Report (DPR) for Punatsangchu H.E.P. and for upgradation of Chukhha H.E.P.**