ROLE OF PUBLIC PRIVATE PARTNERSHIP IN HYDROINFORMATICS

Deepa Chalisgaonkar
Scientist 'F', National Institute of Hydrology, Roorkee

ABSTRACT

Water resources planning and management is a complex task where public and private sector both have a role to play. The National Water Policy 2002 also spells out the ambit for private sector participation. The private sector participation is deemed helpful at introducing innovative ideas, generating financial resources, introducing corporate management, and improving service efficiency and accountability to users. In Indian water sector, the participation of private sector is envisaged only for supply of water and its infrastructure. However, the time has come to make the use of participation of private sector in a new area by collaborating with Information Technology (IT) industry for developing user interactive software for wide applicability of advanced technologies in water sector. Today an increasing number of tech majors and emerging technology companies are using India as a development base because of lower cost of infrastructure. Collaborations can be made with IT companies in Public-Private-Partnership (PPP) mode, to develop menu-driven software with appropriate and effective technology. This collaboration will provide IT solutions and tools for the development and enhancement of hydrological applications. Some of the areas for softwares development are: reservoir operation, flood estimation, flood routing, water demand, water allocation and optimal use, resource assessment, conjunctive use, seepage studies, ground water flow modeling etc. Practicing engineers and scientists as well as field and academic organisations find these tools of immense use.

1.0 NEED OF IT TOOLS IN WATER RESOURCES PLANNING AND MANAGEMENT

Water resources planning and management includes both structural interventions and nonstructural rules and policies. Structural interventions include the design and construction of physical works under criteria of safety, workability, durability, and economy, including short-term, operation and maintenance activities with existing structures and long-term investments in new structures. Nonstructural interventions combine optimal operating rules of hydrologic systems, economic optimization of water allocation, and understanding community behavior and institutional processes related to the formation and support of agencies making decisions about water management. These institutional directives, financial incentives, and hydrologic system operating rules have greatly modified the traditional, structural approach to water management. The interdisciplinary nature of water problems require the integration of technical, economic, environmental, social, and legal aspects into a coherent framework for decision making purposes.

Developments in systems analysis and information technology have made significant advances in water resources management. Complexity associated with management of water resources calls for use of tools capable to mirror the complexity of problems under consideration. Simultaneously these tools have to be capable to cope efficiently with the multiplicity and amount of information which has to be processed during decision making. It is a challenge to integrate new information technologies with traditional methods of analysis and to put these tools to work in practice. Presently, some softwares for water management are available worldwide and they are being applied in India also but there are problems in their direct application to Indian conditions. The task can be better achieved with by developing dedicated interactive softwares consisting of analytical tools and information management capabilities. India is having a large number of experienced domain experts in the various fields of water resources development and they have developed number of softwares mainly in FORTRAN language. For a field engineer having limited knowledge of computer, it becomes difficult to use the available methodology in the form of computer programmes. So there is a need to develop user-friendly software package for the benefit of field organisations.

2.0 IT DEVELOPMENT IN INDIA

Today India is home to some of the finest software companies in the world. With the huge success of the software companies in India, the Indian software industry in turn has become successful in making a mark in the global arena. This industry has been instrumental in driving the economy of the nation on to a rapid growth

curve. As per the study of NASSCOM, the IT industry recorded a growth of 4 - 7 percent in the year 2010. In fact, software export from India accounts for more than 65% of the total software revenue. The domestic software market largely depends upon sale of software packages and products, which constitute major part of revenues. Products account for almost 40% of the domestic market. On the other hand, more than 80% of revenue from software export comes from software services like custom software development and consultancy services etc. An increasing number of tech majors and emerging technology companies are using India as a development base because of lower cost of infrastructure. The destination of Indian software exports has been shown in fig.1.

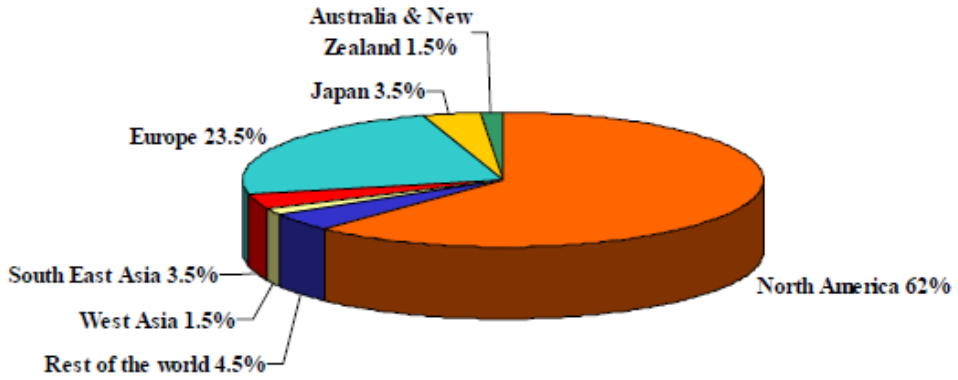

Fig.1 : Software Exports by Indian IT Companies

India is an IT partner of choice. It is playing a key role in fulfilling IT service needs of an increasing number of countries.

3.0 HYDROINFORMATICS

Hydroinformatics is about making use of advanced information, communication and computational technologies to handle information concerning the issues of the equitable and efficient use of water for many different purposes. It consists of routines for data Processing, analysis and decision support. Typical tools for hydroinformatics include: internet resources; computer programming; data processing; numerical methods, and Geographical Information Systems (GIS).

More specifically, Hydroinformatics deals with the dynamics of information flow through the “data - models - knowledge - decisions - impacts” chain:

- from data acquisition and analysis using advanced IT and remote sensing tools;
- through optimisation of water management and control;
- where hydroinformatics tools enhance social and stakeholder collaboration through participatory processes;
- to dissemination of knowledge and stakeholders’ feedback through appropriate use of communication systems like mobile telephony and Internet.

Nowadays most of the water related projects are executed with modelling supported by IT based tools. Hydroinformatics is a strongly inter-disciplinary field, which links water related problems with various computational modelling methods and fast developing information and communication technologies.

4.0 NEED OF COLLABORATION IN HYDROINFORMATICS?

Water sector research is facing pressures to decrease time-to-market for new inventions, and to conduct research aimed at specific, identifiable customer needs. The research can be made popular by devloping user-friendly softwares models for them so that they can be easily used. The software development involves the interplay of a wide range of IT tools, and all the necessary tools expertise may not lie with the water resources experts. These tools can be developed the It company. To bring together all this expertise, there is a compelling need for collaboration. India has seen the rise of various forms of collaboration among the sectors of government, academia, and industry. These forms include sector-specific inter-firm research consortia, government-industry technology transfer, and university-industry research centers. Yet the emergence of R&D organisation-IT industry strategic partnerships is relatively recent, and often fostered by specific government programs.

Globalisation and increasing speed to market are causing more and more organisations to review all aspects of their efficiency, including their R&D activities and spending. Organisations are increasingly market-driven and as a consequence assess their needs for technology according to their estimates of what market demand requires and justifies. The spending on R & D activities are also being critically examined as a result of the increasing development of deep specialisms and the costs associated with the pace of technological change. In view of this the organisations are planning to make the R & D more cost-effective. They are also planning whether technology should be developed through in-house R & D, collaboratively with partners, or purchased. These trends make new and increased demands on governments. The accelerating pace of market and technological change, the high costs of essential investment in many areas of technology, and the strategic importance of technology in many product markets are all factors which may justify new government action. Failure by governments to respond to these challenges puts at risk economic competitiveness, not only but especially among SMEs, and employment.

5.0 WHAT IS PUBLIC-PRIVATE PARTNERSHIP (PPP)?

This generic term refers to arrangements whereby public entities, such as governments or publicly owned utilities, enter into contracts with private sector organizations (sometimes including non-government organizations) to perform defined. It is sometimes also referred to as private sector participation, but the term PPP is more inclusive. In general terms, a PPP refers to a contractual agreement formed between a government agency and a private sector entity that allows for greater private sector participation in the delivery of public infrastructure projects. Compared with traditional approaches, the private sector assumes a greater role in the planning, financing, designing, construction, operation, and maintenance of public facilities.

PPP in R & D organisation with IT industry can be broadly refers to long-term, contractual partnerships between government/public and private sector agencies, specially targeted towards financing, designing, implementing, training and operating software facilities to provide services that were traditionally provided by the public sector. In a PPP, each partner, usually through legally binding contract(s) or some other mechanism, agrees to share responsibilities related to development and implementation and/or operation and management of a project. This collaboration or partnership is built on the expertise of each partner that meets clear needs of the PPP partner.

6.0 THE ROLE OF PPP IN HYDROINFORMATICS

Problems of water management are large and complex. The public and the private sector both have a role to play. The 2002 National Water Policy of the Government of India encouraged private participation in planning, development and management of water resource projects. Accordingly, this should be a promising time for Public Private Partnerships (PPPs) in the Indian water sector. The private sector participation is deemed helpful at introducing innovative ideas, generating financial resources, introducing corporate management, and improving service efficiency and accountability to users. In India, the participation of private sector is envisaged only for supply of water and its infrastructure. However, the time has come to make the use of participation of private sector in a new area by collaborating with Information Technology (IT) industry for developing user interactive software for wide applicability of advanced technologies in water sector. Today an increasing number of tech majors and emerging technology companies are using India as a development base because of lower cost of infrastructure. Collaborations can be made with IT companies in Public-Private-Partnership (PPP) mode, to develop menu-driven software with appropriate and effective technology. This collaboration will provide IT solutions and tools for the development and enhancement of hydrological applications. The emphasis can be given on methods to minimize learning time and errors in application. Some of the areas for softwares development are: reservoir operation, flood estimation, flood routing, water demand, water allocation and optimal use, resource assessment, conjunctive use, seepage studies, ground water flow modeling etc. Practicing engineers and scientists as well as field and academic organisations find these tools of immense use.

R & D organisations can work in PPP mode with IT industry and provide versatile software for practicing design engineers in various field of water engineering. Some of the areas where PPP can be effectively used in developing software in water sector are : reservoir operation, flood estimation, statistical analysis, flood routing, water demand, water allocation and optimal use, resource assessment, conjunctive use, seepage studies, ground water flow modeling etc.

The software can be designed in such a way so that they can :

- Assist water managers in their results,
- Support and enhance managerial judgment,
- Improve the effectiveness of decision making rather than the efficiency,

- Combine the use of models or analytical technique with data access functions,
- Focus on features, which make them easy to use by inexperienced users.

The aim should be to create a system in which the mechanics of linking one component with another are largely transparent to the user. In this way, the person responsible for the actual project should be able to make rational use of the system without an in-depth knowledge of modeling techniques. An interactive software would provide a better means for organizing, accessing, and evaluating a wide range of information and alternative strategies. Benefits from such a software include better access to information, improved evaluation tools, enhanced communication, and better project management.

7.0 ATTRACTIVENESS OF THE BENEFITS ACCRUING TO THE PPP STAKEHOLDERS

The demand for innovation in the water sector is largely driven by a handful of organisations dealing in software development. The situation is further complicated by the funding structure and competitive environment. Collaboration of R & D organisations with IT industry will play a role of growing significance and will integrate disparate pools of IT persons and water resources managers. The participants in the partnership bring to the table very different skills, capabilities, and organizational contexts. The alliance evolves into a shared community of innovation, where each participant retains the legacy of its origins, but joins a network of researchers that evolves its own common values, norms, and vocabulary. The knowledge from each organization can then be integrated within the new context of a community of innovation, and applied by each participant toward its own learning goals. The advantages of PPP in R & D organisations with IT industry will be :

- attracting private capital in the form of PPP is a key strategy
- specialized expertise
- speedy, efficient and cost effective delivery of projects
- efficiencies from integrating collaboration with IT industry with financing, operation and maintenance/upgrading of software
- competition and greater development capacity

The IT company will be benefited from the development of softwares in water sector as the software developed will provide them a great market in the area and they will get due return of their investments. However, the IT company may be asked to give royalty to the R & D organizations in water sector on software sales, if technical input in the form of old softwares / testing / solution has been provided by the R & D organizations to IT company.

7.1 Possible PPP Partners

- Companies dealing in hydro-meteorological instruments
- Companies dealing in development of electronic sensors & systems
- Consultancy firms dealing in management of water resources

They can be finalised by calling Expression of Interest (EOI) / Request For Qualification (RFQ) and Request For Proposal (RFP) in leading newspapers.

7.2 Users of the Outcome of the Research

The beneficiaries include:

- Government organizations (meteorology, drinking water, sanitation, irrigation, environment and pollution control, agriculture, rural development, disaster management, planning, project funding)
- Academic and research institutions, NGOs, User industries (hydropower, farming, horticulture, aquaculture, construction, insurance companies, aviation, transportation, wastewater treatment, rainwater harvesting, drainage utilities, banks, microfinance)

7.3 Lessons from the Global PPP Experience

PPPs have proven to be an effective delivery tool – under specific conditions! The key to success is the role of the public sector. Most commonly project ‘failure’ has equated to the financial failure of the private operator. A significant part of designing an enduring market, and therefore private sector willingness to fund and undertake risk, entails improving public sector capacity to execute and manage sustainable partnerships. Poor PPP outcomes can be seen to have emanated from poor setup, lack of clarity about project objectives, too much focus on the transaction, inappropriate risk model applied to project, lack of internal capacity, failure to realise value for money, inadequate planning etc.

8.0 CONCLUSION

Though PPP is a relatively new approach to procurement, lessons could be drawn from the experiences of developed and developing countries on the conditions for the success of PPP. As a relatively late entrant in the PPP development process, India can learn and benefit from these lessons. PPP has a vital role to play in hydroinformatics and if implemented properly can provide access and usage to large number of personnels working in the water sector. The implementation benefits are :

- Setting up of more efficient funding mechanisms through better administrative and financial procedures for promotion of hydroinformatics.
- Creation of world-class facilities in nationally relevant fields to enhance India's international competitiveness in areas where we have strengths, opportunities or natural advantages.
- PPP are not the panacea but have a strong potential
- PPP should not be a conditionality of donor but the decision of national, local government
- Transparent processes and accountability are key

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BRIEF PROFILE OF THE AUTHORS

Deepa Chalisgaonkar, Scientist 'F' at National Institute of Hydrology, Roorkee, graduated in Electronics Engineering from the Jiwaji University, Gwalior in 1983. She obtained Master of Engineering degree in Computer Science from University of Roorkee (now IIT, Roorkee) in 1985. Her areas of specialization include hydroinformatics and software development.