

INTEGRATED WATER RESOURCES DEVELOPMENT AND MANAGEMENT IN INDIA

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Abstract

Most of India's river basins are inter-State in nature. India's Constitution provides power to the States to develop the water resources within their boundaries subject to Parliament empowering Union Government to regulate and develop inter-State rivers to the extent to which such regulation and development is declared by the Parliament by law to be expedient in the public interest. The schemes for water resources development are taken up by the respective State Governments.

The National Water Policy (2002) provides for planning of water resources development and management for a hydrological unit. It further emphasizes for establishment of appropriate river basin organizations for the planned development and management of a river basin as a whole or sub-basin. For the purposes of planning and development of water resources, the entire country has been divided into twenty river basins comprising twelve major basins and eight composite river basins.

In early stages of water resources development in India, the States had chosen easy sites for the water resources development projects. Consequently, much attention was not paid for formulating comprehensive plans for optimum utilization of water resource of a basin. In most cases water resources development projects were planned and developed as single entity with the sole intention of meeting project specific demands.

With the increase in population and overall economic development of the country there has been considerable increase in water demand for meeting various basic and developmental needs. For optimum utilization of water resources and maximizing the benefits, integrated planning and development approach of the river basin as a unit is increasingly adopted to balance and satisfy the competing interest of all the stakeholders. As formation of river basin organizations is considered a right step in this direction, there is a need to set up river basin organization for each river basin to take up the integrated planning, development and management of the basin. The paper discusses the issues involved in such river basin development in the Indian context.

*Key words: basin development comprehensive plans hydrological unit
Integrated development optimum utilization river basin organisation*

1.0 INTRODUCTION

India is a vast country with a total geographical area of 3.29 million km². It is bounded by the Himalayas in the North, the Indian Ocean in the South, the Bay of Bengal in the East and the Arabian Sea in the West. Due to its vastness, the different regions of the country have varied climates and rainfall patterns. India is a Union of States comprising 28 states and 7 Union Territories. With a population of more than one billion, around 16% of Global population, India is the second most populous country in the World. About three-fourth of the population live on agriculture and 25% of gross domestic product comes from agriculture.

India has about 4% of the world's water resources. Water is a prime natural resource, a basic human need and a precious national asset. Growing population, urbanization and economic development are exerting pressure on the available freshwater resources. Most of the water resources of India is replenished by monsoon rainfall. Owing to the wide variation in availability of rainfall in time and space, many parts of the country is facing drought-flood-drought situation.

Most of the rivers in India are inter-State. The Constitution of India provides power to the States to develop the water resources within the state subject to Parliament empowering Union Government to regulate and develop inter-State rivers to the extent to which such regulation and development is declared by the Parliament by law to be expedient in the public interest. At the initial stages of water resources development, States were planning and executing water resources development projects at better locations in the river basins. The future major water resources development projects have to be taken up at rather difficult locations. The new projects are more likely to be inter-State in nature.

Realizing the importance and scarcity value attached to freshwater and need for optimum utilization of water resources, the Government of India is taking steps for integrated planning, development and management of water resources of the country. Setting up of River Basin Organization with necessary powers is a right step in this direction.

2.0 NATIONAL WATER POLICY

A National Water Policy was first adopted in the year 1987. In view of the emergence of new challenges in water resources sector, it was considered necessary to review the Policy. The reviewed and updated water policy known as the National Water Policy 2002 (NWP-2002) was adopted in April, 2002. The NWP-2002, in particular states that the water resources development and management will have to be planned for hydrological unit such as drainage basin as a whole or for a sub basin, multi-sectorally, taking into account surface and groundwater for sustainable use incorporating quantity and quality aspects as well as environmental considerations and that all individual developmental projects and proposals should be formulated and considered within the framework of such an overall plan keeping in view the existing agreements/awards for a basin or sub-basin so that the best possible combination of options can be selected and sustained. In order to achieve the objectives appropriate institutional mechanism is considered necessary. NWP-2002

provides for establishment of river basin organization. The relevant Para is as under:

“4.2. Appropriate river basin organizations should be established for the planned development and management of a river basin as a whole or sub-basins, wherever necessary. Special multi-disciplinary units should be set up to prepare comprehensive plans taking into account not only the needs of irrigation but also harmonizing various other water uses, so that the available water resources are determined and put to optimum use having regard to existing agreements or awards of Tribunals under the relevant laws. The scope and powers of the river basin organizations shall be decided by the basin states themselves.”

Project Planning

“6.4. There should be an integrated and multi-disciplinary approach to the planning, formulation, clearance and implementation of projects, including catchment area treatment and management, environmental and ecological aspects, the rehabilitation of affected people and command area development

“6.6 The drainage system should form an integral part of any irrigation project right from the planning stage.”

“6.8. The involvement and participation of beneficiaries and other stakeholders should be encouraged right from the project planning stage itself.”

Participatory Approach to Water Resources Management

“12. Management of the water resources for diverse uses should incorporate a participatory approach; by involving not only the various governmental agencies but also the users and other stakeholders, in an effective and decisive manner, in various aspects of planning, design, development and management of the water resources schemes. Necessary legal and institutional changes should be made at various levels for the

purpose, duly ensuring appropriate role for women. Water Users' Associations and the local bodies such as municipalities and *gram panchayats* should particularly be involved in the operation, maintenance and management of water infrastructures/ facilities at appropriate levels progressively, with a view to eventually transfer the management of such facilities to the user groups/local bodies.”

The above policy provisions can be effectively implemented through integrated development and management of water resources of a basin or sub-basin requiring an appropriate River Basin Organization.

3.0 WATER AVAILABILITY

Most of India's freshwater is received through monsoon rainfall. The average annual rainfall in the country is about 1170 mm per year. However, there is considerable variation both in space and time. The rainfall is generally confined to only about three or four months in an year and varies from about 100 mm in the Western parts of India to over 10,000 mm in the North-Eastern parts. As a result of rainfall and snow melt, the availability from surface water and replenishable groundwater is put at 1,869 billion cubic metre (BCM). Because of topographical and other constraints, only about 1122 BCM (690 BCM from surface water and 432 BCM from replenishable groundwater) can be put to beneficial use.

4.0 RIVER BASINS OF INDIA

In India, there are 20 river basins comprising twelve major river basins each having drainage area exceeding 20,000 km² and eight composite river basins combining suitably together all the other remaining medium and small river systems for the purpose of planning and development. Most of these river basins are inter-State in nature. As assessment of water resources potential river basinwise is an essential pre-requisite for the efficient planning and development of water resources, river basinwise total annual availability of water in India has been assessed as 1,869 BCM.

5.0 PER CAPITA WATER AVAILABILITY

The water availability in India remains more or less fixed according to the hydrologic cycle, but the per capita availability is reducing progressively due to the increase in population. The population of India has grown almost three times since its independence in 1947. Thus, the per capita availability of water has also reduced to almost one third. The per capita water availability in 2001 was about 1820 m³. Owing to large variation in the rainfall from region to region, the per capita availability of water differs considerably from one river basin to other.

According to accepted international norms any situation where per capita water availability is less than 1700 m³ per person per year is considered as water stressed and less than 1000 m³ per person per year is water scarce. As per these norms some of the river basins of India already fall into water scarce category.

6.0 PROJECTED WATER DEMAND

A Standing Sub-committee constituted by the Ministry of Water Resources for assessment of availability and requirement of water for diverse uses in India has estimated the total demand for water as 1093 BCM and 1447 BCM in 2025 and 2050 respectively against the total utilizable water resources of 1122 BCM. The scenario indicates water deficiency in the overall national perspective. The suggestions made to bridge the gap between demand and availability are development of untapped water resources, reuse of water, recycling of water, increasing the efficiency of present use of water and inter-basin transfer of water from surplus river basins to deficit river basins.

7.0 INTER-STATE ISSUES AND LEGAL FRAMEWORK

As already mentioned most of the rivers in India are inter-State in nature. India's Constitution provides power to the States to develop the water resources within their boundaries subject to Parliament empowering Union Government to regulate and develop inter-State rivers to the extent to which such regulation and development is declared by the Parliament by law to be expedient in the public interest. As most of the rivers in India are inter-State, the regulation and development of water of these rivers, is a possible source of inter-State difference and disputes.

7.1 Constitutional Provisions

The Constitution of India has demarcated clearly areas of legislative, executive and financial powers between the Union of India (Centre) and the States. Hence, the river basin planning, development and management has to fall within the parameters of constitutionally assigned competence. The constitutional provisions in respect of allocation of responsibilities between the States and Centre fall into three categories namely, the Union List (List I), the State List (List II) and the Common List (List III). Article 246 of the Constitution deals with subject matter of laws to be made by the Parliament and by Legislatures of the States. The Constitutional provisions in regard to water are as follows:

Entry 17 in List II (State List)

“Water, that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and water power subject to the provisions of entry 56 of List I”.

Entry 56 of List I (Union List)

“Regulation and development of inter-State rivers and river valleys to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest”.

Article 262 of the Constitution

“(1) Parliament may by law provide for the adjudication of any dispute or complaint with respect to the use, distribution or control of the waters of, or in, any inter-State river or river valley”.

“(2) Notwithstanding anything in this Constitution, Parliament may by law provide that neither the Supreme Court nor any other Court shall exercise jurisdiction in respect of any such dispute or complaint as is referred to in clause (1)”.

The Government of India has, so far, not exercised these provisions effectively in view of complex and sensitiveness involved in inter-State water disputes.

7.2 Parliament Legislation

The Central Legislation, so far, enacted under the Constitutional provisions consists of two Acts, one under Entry 56 namely, the “River Boards Act, 1956” and the other under Article 262, namely the “Inter-State River Water Disputes Act, 1956”.

7.3 River Boards Act, 1956

The River Boards Act, 1956 is an Act to provide for the establishment of River Boards for the regulation and development of inter-State rivers and river valleys. The Central Government may, on a request received in this behalf from a State Government or otherwise establish a River Board, when it is declared that it is expedient in the public interest that the Central Government should take under its control the regulation and development of the inter-State rivers and river valleys to the extent provided in the Act.

The Central Government has, however, not been able to constitute any River Boards under this Act. The role of the River Boards as envisaged in the Act is only advisory in nature. The Central Government has established some bodies either to deal with specific projects on inter-State rivers or for the preparation of master plans for a river basin and its sub-basins through Government Resolution or through specific legislation by Parliament independent of the River Boards Act.

7.4 Inter-State River Water Disputes Act, 1956

The Inter-State River Water Disputes Act, 1956 was enacted by Parliament for adjudication of disputes relating to water of inter-State rivers and river valleys under Article 262 of the Constitution of India. Though Section 11 of the Act precludes all the courts including Supreme Court from having jurisdiction in respect of any water dispute which may be referred to a Tribunal under this Act, the disputes are still taken to the Supreme Court on the interpretation of the Awards given by the Tribunal, thereby delaying the progress of the water resources development projects and optimum utilization of water resources.

8.0 ISSUES IN INTER-STATE WATER RESOURCES DEVELOPMENT

The issues in development of water resources need not necessarily mean only disputes between the States on sharing of waters of inter-State rivers, which is often the general perception, but even the interpretation of Tribunal Awards, agreements for sharing, issues related to construction of projects on inter-State rivers, construction of joint projects, operation and regulation of water for various beneficial uses and the controlling mechanism established for such regulation etc. also form part of disputes. Negotiated settlement through discussion by the party States is the most preferred path for resolution of inter-State issues in water resources development.

8.1 Negotiated Settlement

Many of the inter-State water disputes among the States have been resolved through a process of negotiations under the good offices of the Central Government. Further, without the direct involvement of the Central Government, some of the States have been able to resolve their disputes through negotiated settlement among themselves. The efforts of the Central Government have always been for a negotiated settlement of water disputes rather than through adjudication by Tribunals.

8.2 Settlement through Adjudication

When the Central Government is satisfied that the disputes on sharing of water of an inter-State river cannot be settled by negotiations among the party states, the same is referred to a Tribunal under the provisions of Inter-State Water Disputes Act, 1956. Five tribunals under the Act have, so far, been set up for resolution of the water disputes related to the river valleys namely Krishna, Godavari, Narmada, Ravi-Beas and Cauvery. The Krishna, Godavari and Narmada Tribunals have given their final Award. But the Ravi-Beas and Cauvery Tribunals are yet to give the final Award. The Ravi-Beas Tribunal accepted the river basin as a unit for allocation of water among the basin States.

9.0 BASIN DEVELOPMENT INITIATIVES IN INDIA

As already mentioned, the concept of river basin level development is not new in India. Basin level planning and development has been attempted in India immediately after independence by establishing organizations for specific functions and objectives. These are briefly discussed below.

9.1 Damodar Valley Corporation

The Damodar Valley Corporation (DVC) came into existence on 7 July, 1948 by an Act of Parliament of India for development and management of the Damodar basin as a whole. The functions of the DVC include promotion and operation of irrigation, water supply, drainage, hydro-electric and thermal power generation, flood control, navigation, afforestation, control of soil erosion, public health, agricultural, industrial, economic and general well-being in the Damodar Valley. The DVC continues to be in existence for the management and operation of all the projects under its control excluding water and power distribution to consumers.

9.2 Tungabhadra Board

The Tungabhadra Board was constituted on 1 October, 1953 under Andhra State Act, 1953 by a notification for the completion of the inter-State project Tungabhadra Dam and to deal with all matters relating to works which were common to the States of Andhra and Mysore. The Board was reconstituted later on and continues to discharge the functions like regulation and supplies of water and power as per the Tribunal Award, maintenance of common portion of dam and canals and fisheries development in the reservoir.

9.3 Krishna-Godavari Commission

The Krishna-Godavari Commission was constituted in 1961 in order to review the availability of supplies in Krishna and Godavari basins, reporting on the requirements of projects in the basins and reporting on the feasibility of diverting any surplus supplies in Godavari to the Krishna. The Commission was wound up after submission of the final report in 1962. The recommendations of the Commission include establishment of a network of hydrometeorological, sediment and water quality observation sites as well as setting up of Inter-State River Board for coordinated Planning and integrated of operation all the projects, etc.

9.4 Bhakra-Beas Management Board

The Bhakra-Beas Management Board was constituted through an executive order of the Central Government in accordance with the Punjab Reorganization Act, 1966 to regulate the supply of the river Sutlej, Ravi and Beas to the States of Punjab, Haryana, Rajasthan and National Capital Territory of Delhi and to distribute power from the Bhakra-Nangal and Beas Projects to the States of Punjab, Haryana, Himachal Pradesh, Jammu and Kashmir, Union Territory of Chandigarh and Delhi when required. The Board falls under the category of organizations responsible for the operation and maintenance of water resources projects.

9.5 Ganga Flood Control Board

The Ganga Flood Control Board (GFCB) was set up in 1972 by a Government of India Resolution. The Ganga Flood Control Commission (GFCC) was constituted by the Central Government in April 1972 as per the provision in the resolution constituting GFCB for assisting the GFCB. The important functions assigned to the GFCC are to prepare comprehensive plan of flood control for the Ganga sub-basin, to monitor the execution of the important flood control schemes particularly those being executed under the Central sector or Centre's assistance and to evaluate the performance of major flood control measures executed by the States including inter-State schemes.

9.6 Betwa River Board

Betwa River Board was constituted by an Act of Parliament in 1976 to carry out surveys and investigations in the Betwa inter-State river valley and prepare a comprehensive project report and cost estimates, allocate the cost among the states of Madhya Pradesh and Uttar Pradesh, lay down rules for operation and management of Rajghat Dam. The Board is vested with powers to acquire, hold and dispose of such properties, to publish statistics or other information relating to various aspects of flood control and drainage in the Betwa River Valley, regulation of Rajghat Reservoir and generation of power at Rajghat Dam.

9.7 Bansagar Control Board

Bansagar Control Board was set up in 1976 by the Central Government in accordance with an agreement reached among the State Governments of Madhya Pradesh, Uttar Pradesh and Bihar on 16 September, 1973 for sharing the waters of the Sone and the cost of Bansagar Dam. The Board was entrusted the task of ensuring efficient, economical and early execution of Bansagar Dam including all connected works in Madhya Pradesh but excluding the canal systems which will be executed by the respective States.

9.8 Brahmaputra Board

The Brahmaputra Board was set up in 1980 by an Act of Parliament to prepare a master plan for the control of floods in the Brahmaputra Valley giving due regard to overall development and utilization of the water resources of the valley for irrigation, hydropower, navigation and other beneficial purposes.

9.9 Narmada Control Authority

The Narmada Control Authority (NCA) was set up by a resolution of the Central Government in 1980 as per the provisions contained in the Narmada Water Disputes Tribunal (NWDT) Award. The main functions of NCA are overseeing the implementation of the NWDT Award for planning and management of the waters of Narmada basin including storage apportionment, regulation and control of storages,

sharing of power benefits from Sardar Sarovar Project, etc. A Review Committee headed by the Union Minister for Water Resources and Chief Ministers of the States of Madhya Pradesh, Maharashtra, Gujarat and Rajasthan and Union Minister for Environment and Forests as members has to take final decision on matters of any disagreement, which is binding on all co-basin States.

9.10 Sardar Sarovar Construction Advisory Committee

The Sardar Sarovar Construction Advisory Committee (SSCAC) was set up by a resolution of the Central Government in 1980 as per the provisions contained in NWDT Award. The main function of SSCAC is to achieve efficient, economic and early execution of Sardar Sarovar Dam.

9.11 Upper Yamuna River Board

The Memorandum of Understanding signed by the Chief Ministers of the basin States of the Yamuna on 12 May, 1994 takes care of the irrigation and consumptive drinking water needs of all co-basin states and has opened up possibilities of development of the water resources in the Upper Yamuna River Basin. A Board has been constituted for the purpose of allocating the available flows among co-basin States within the overall frame work of the agreement.

10.0 INTEGRATED WATER RESOURCES DEVELOPMENT AND MANAGEMENT

The concept of river basin for planning, development and management of water resources in an integrated manner considering all the needs of the stakeholders is not new in India as can be seen from the earlier paragraphs. The diminishing per capita availability, increasing demand and varying interest of the users and stakeholders are not only putting strain on the limited resources but also open up new challenges for the water planners in India. With the available technology India is marching ahead to meet the challenges.

The vision for integrated water resources development and management in India can be summed up in the following lines.

“Optimal sustainable development and maintenance of quality and efficient use of country’s water resources to match the growing demand on the precious natural resource with active involvement of all stakeholders in order to achieve accelerated, equitable economic development of the country”

The above vision can be implemented only by adopting comprehensive and integrated approach for water resources development and management after proper assessment of water availability and demands. Establishment of River Basin Organizations envisaging integrated planning and management of water resources is a right step in this direction.

10.1 River Basin Organizations in India

Proposal for establishment of River Basin Organizations(RBO) has been under consideration for a long time and related issues have been examined by several committees with a view to suggest the form and role of the basin level organizations. As few of the river basins have already some organizations, these can be reconstituted and for the rest can be established afresh. The RBO in the Indian context is envisaged as a body in which the concerned State Governments, local Governments and water users would have representation and which would provide a forum for mutual discussions and agreement. The structure of such an RBO considering the need for wide representation, general acceptance and effective functioning would consist of a General Council and a Standing Committee with a permanent secretariat.
