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Managing Water in Federal Countries: India

Rakesh Hooja[1]

PhD, Director of the Harish Chandra Mathur Rajasthan State Institute of Public Administration (HCM RIPA), JLN Marg, Jaipur 302017, and Additional Chief Secretary (Training) Government of Rajasthan, Jaipur, INDIA

[1] The views and opinions expressed in the paper are purely those of the author and they do not necessarily reflect those of the governmental organisation where the author works.

Abstract

Keywords

LIST OF ACRONYMS/Terms:

CAD: Command Area Development
CAD & WU Department: Command Area Development and Water Utilisation Department
CWC: Central Water Commission
ICAR: Indian Council for Agricultural Research
MOWR: Ministry of Water Resources
NABARD: National Bank for Agriculture and Rural Development (earlier called Agriculture Refinance Corporation or ARC)
NRAA: National Rainfed Area Authority
NWB: National Water Board
NWRC: National Water Resources Council
PHED: Public Health Engineering Department
PRIs: Panchayati Raj Institutions

- Zila Parishad – District Council
- Intermediate level Panchayat (variously called Panchayat Samiti or Mandal Panchayat in different States)
- Village Panchayat or Gram Panchayats
- Urban local bodies (Municipal Corporations and Municipal Councils)

Union Government: Central, or Federal Government
Water Resources Department: Refers to also the Irrigation Department (State), Public Works Department (PWD)
WUA: Water Users Association

I. Introduction

1. General Comments

In this paper it is intended to initially describe the constitutional provisions regarding the role of the Central (Union) Government, State Governments and local bodies in water management, as well as the water related organisations at Union Government, State Government and sub-State levels. Thereafter issues, administrative and otherwise, in managing water in India which is a federal (or as some people prefer to call it "quasi federal", or "Union Model") country, shall be

discussed followed by a review of how inter-State water disputes have been managed. For purposes of this paper the term "water management" is being used in its broadest meaning of water resources management to include the development of water projects, the operation and maintenance of water delivery systems, and other water management issues like sharing between alternate uses and amongst different regions, as well as measures to ensure optimum use of water, most of which are undertaken by government agencies. Keeping in mind that water resource management strategies have to be context specific and that there are no one-size-fits-all-countries framework, this paper is meant to provide to the reader with a good feel for how water is managed particularly at State and sub-State levels in India and the role that the Union Government has been trying to play.

2. Constitutional Background

Many of India's constitutional arrangements that came into force in 1950 go back to the days of British rule, or as we in India refer to it, the British Raj. A lot of the federal type arrangements date back to at least the pre-independence *Government of India Act* of 1935.

India is not a country made up of separate States coming together. All of what today is India was part of the British Raj either as directly ruled by the British or as what were princely States under the paramountcy of the British.

The Constitution of India simultaneously created the Indian Union and the States, whose boundaries can be altered or new States created even today. The word federal is never mentioned in the Constitution. When the Constitution was framed, India had just been through a painful and violent partition of the British Raj into India and Pakistan. So our Constitution makers tilted the Constitution in favour of the Union and not in favour of the States. However, this does not hold true for water related matters, as this paper demonstrates.

It may be pointed out that India is a Union of 28 States and seven Union Territories with two Union Territories having their own legislatures. It is further divided into 607 districts which are administrative units of the State Government. Most of the rural districts also have a Zila Parishad (District Council) as the highest of three tiers of Panchayati Raj Institutions (PRIs) or rural local bodies. The total number of PRIs in India is 2,39,544 of which 537 are Zila Parishads and 6094 are intermediate level Panchayats (variously called Panchayat Samiti or Mandal Panchayat in different States), the rest being village Panchayats or Gram Panchayats. There are 3551 urban local bodies (Municipal Corporations and Municipal Councils) in the country.

3. Hydrology of India

More than 70% of the annual rainfall in most parts of India (though the countries average annual rainfall is 105 cm, the quantum of rainfall differs a lot from region to region in India) is usually concentrated during the three monsoon months July to September. Within those three months most rain falls in about 40 rainfall days each year. And in many parts large proportions of the annual rainfall would be on three, four or five days of heavy rainfall. Many parts of the country face annual floods following the monsoon rains, while significant parts of the country are prone to periodic annual monsoon rainfall failure resulting in droughts and famines. This naturally affects the thinking of everyone from those in the Union and State Governments down to farmers who may be looking to their local village ponds. Concerns include approaches to water storage, dams, embankments to either retain waters for subsequent use or to prevent floods, water diversion and use of groundwater.

Further, at least since 1860s the State Governments assumed all rights to constructing water projects, as well as all rights over rivers, water bodies etc. So private or community management of water can take place only if the government

permits it. The only exception is extraction and use of groundwater from one's own fields since groundwater rights are attached to the land. While one may sell the extracted groundwater, groundwater rights cannot be sold separately; they go with the land. Only recently has government decided to consider permitting private entry through PPPs (public private partnerships) for hydropower development.

State Governments' water rates for supply of irrigation water and of domestic/drinking water have traditionally been kept very, very low and no State Government has shown, or appears likely to show, the political courage (for fear of losing votes in elections) to significantly raise such charges even to the extent of being able to meet maintenance costs through the fees collected. This naturally limits the governments' capabilities as regards water management.

We may add that while India has almost 16% of the world's population it has to make do with 4% of the world fresh water resources. Average surface water flows in India have been estimated as 1869 b.c.m. (billion cubic meters) of which about 690 b.c.m. may be utilised (conditional availability) if appropriate storages are created. In addition there is a dynamic (rechargeable) groundwater resource whose potential has been estimated as 432 b.c.m., including recharge due to canal irrigation. Thus the estimated exploitable water resources are 1122 b.c.m. (690 plus 432). River basin wise water availability is indicated at Table 1. At the end of the 20th century, the country's purposewise utilisation in b.c.m. of water was assessed as (i) Irrigation 501, (ii) Domestic (including drinking) 30, (iii) Industrial 20, (iv) Energy 20, and (v) Others 34, total 605 b.c.m. India has a population of 1028 million (2001 Census) and its total area is 32,87,263 km^2 or approximately 329 million hectares out of which about 146 million hectares is degraded and 85 million hectares is rainfed arable land. Net cultivated area is about 145-150 million hectares. Out of India's cultivated area 40% is irrigated producing 55% of the country's food, while 60% is rainfed producing the balance of 45%. Further

within the net irrigated area 31% is covered by canal water, 58% by groundwater and 11% by tanks and other sources.

4. Water as per the Constitution

The Constitution of India (adopted in 1949) lays down the legislative and functional jurisdiction of the Union and State Governments including that in respect of water. Water is essentially a State subject, and has been so since the Government of India Act 1935 of British India transferred irrigation from the control of the centre to the provinces, and the Union Government has a constitutional role only in the case of inter-State waters. The Seventh Schedule of the Constitution contains lists of subjects on which the Union Parliament can legislate (List I, Union List), on which both the Union Parliament and the legislature of a State can legislate (List III, Concurrent List), and on which only the legislature of a State can legislate (List II, State List). Entry 17 of the State List reads "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 (Union List)". Entry 56 of the Union List reads "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 deals with adjudication of disputes relating to matters of inter-State rivers or river valleys granting the Union Parliament the right to make laws to "provide for adjudication of any dispute or complaint with respect to the use, distribution, or control of water of, or in, any inter-State river or river valley". Only two such laws have been enacted. These are the *River Boards Act 1956* and *Inter State Water Disputes Act 1956* (as amended in 2002). There is also a separate article in the Constitution to deal with general inter-State disputes, but in the case of water Article 262 prevails.

Another relevant entry is Entry 5 in the State List which reads "Local government that is to say, the constitution and powers of municipal corporations, improvement trusts, district boards, mining settlement authorities and other local authorities for the purposes of local self government or village administration". This entry along with the Constitution 73rd and 74th Amendments (both 1992) related to Panchayats and to Municipalities, empowers each State legislature to determine which functions and responsibilities the legislature may like to endow the Panchayats or Municipalities with. The Eleventh Schedule to the Constitution has suggested that State legislatures may consider devolving some powers and responsibilities related to minor irrigation, water management and watershed development, and drinking water, to Panchayat bodies at various levels within their State, and the Twelfth Schedule suggests that State legislatures may consider devolving some powers and responsibilities related to water supply for domestic, industrial and commercial purposes to Municipal Bodies within their State. Decisions in this regard can, and have, differed from State to State who have by and large not been too keen to devolve their powers to the urban and rural local bodies.

"Agriculture" (and thus by implication rural development) closely connected to the management of water, and "public health" which includes the provision of potable drinking water, are also items included in the State List.

Another constitutional provision worth noting is Entry 10 of the Union List which reads "Foreign Affairs, all matters which bring the Union into relation with any foreign country". This read with Entry 14 to the Union List "Entering into treaties and agreements with foreign countries and implementing of treaties, agreements and conventions with foreign countries" means that the Union Government is not bound to consult the States, riparian or otherwise, when negotiating on issues like water sharing and water use with neighbouring countries.

Amendment to the Constitution to modify the Seventh Schedule requires approval by two thirds of the members present and voting in the Central Parliament and by the legislatures of a majority of the States in the Indian Union.

At this juncture it would be relevant to take a look at some of the institutions and organizations at Union, State and sub-State levels which play significant roles in water management.

II. Water Administration and Organisation in India

1. Water Related Organisations in the Union Government

The main water related agency in the Union Government is the Ministry of Water Resources or MOWR (earlier called the Irrigation Department) which is the national organisation responsible for the overall planning and management of the water resources in the country. MOWR was created in 1985. Before that the Irrigation Department was a part of the Ministry of Agriculture. To the extent that the inter-State water disputes (discussed later) have to be dealt with by the Union Government it is this Ministry which is concerned. The Central Water Commission (CWC), Central Groundwater Board and National Water Development Agency provide overall technical support to MOWR. The CWC also provides technical advice if State Governments so require, and is expected to technically examine all large irrigation projects beyond a certain size (medium irrigation projects having a culturable command area – CCA – of 2,000 ha to 10,000 ha and major irrigation projects having CCA of 10,000 ha and more) of State Governments, before the Planning Commission (see below) agrees to permit funds to be earmarked for such projects. However the CWC is a purely Central agency, as is the Central Groundwater Board, though this Board also has offices in many States and has undertaken exploratory drilling and groundwater mapping across the country.

MOWR also operates Centrally Sponsored Schemes (CSSs) particularly in the realm of Command Area Development (CAD) which shall be discussed later; a CSS being one where Central funds are provided to States who have to make available counterpart or "matching funds" in a ratio predetermined for each CSS. The guidelines for a CSS are provided by the Central Government as the major provider of funds for the scheme (who may consult State Governments while formulating such guidelines), while implementation is the responsibility of each State Government, with the concerned Central Ministry monitoring progress in the field before releasing further funds. MOWR has also been administering an Accelerated Irrigation Benefit Program (AIBP) as a CSS where State Governments propose irrigation projects to MOWR for sanctioning of funds for the same and then construct the projects. The Central Government can also, with the consent of State Government concerned, declare a project to be one of national importance in which case the Union Government would assume responsibility for its funding as a Central sector project.

That State Governments manage their waters as per their discretion can be understood from the fact that a model groundwater regulation bill prepared and circulated by MOWR did not find any State Government willing to adopt legislation along the lines of the model bill. An indirect method of Central control of over-exploitation has been devised whereby the National Bank for Agriculture and Rural Development (NABARD, earlier called Agriculture Refinance Corporation or ARC), which is linked to the Department of Banking and the Reserve Bank of India, does not refinance banks for groundwater related (minor irrigation) loaning to farmers in those blocks of the country where groundwater exploitation has crossed a certain level.

Similarly the National Water Policies of 1987 and 2002 in whose formulation MOWR took a lead, which have attempted to bring about agreement among the States on a minimal set of basic statements about water, were not put

into operation as they were not binding upon States who remained able to chose to formulate their own water policies.

MOWR also services the National Water Resources Council (NWRC) set up in 1983 and the National Water Board (NWB) set up in 1990.

The NWRC is presided over by the Prime Minister and includes the Union Minister of Water Resources, the Chief Ministers of all States and Lieutenant Governors of Union Territories and important Central Ministers. Unfortunately it has met infrequently (a total of four meetings in over 20 years till 2004) and has not proved to be very effective. Given the political nature of the body and the need for each State Government and for the Union to agree, its deliberations on most issues remain inconclusive.

The NWB is chaired by the Secretary to Government of MOWR and includes the Chief Secretaries of all States and Union Territories, Secretaries of concerned Union Ministries and the Chairman of the CWC. Given its composition, although the NWB is less political, it is not free from the political process. Before 2004 it had met eleven times. However in view of the need for each State to agree, many issues are kept pending for years.

There is also an Inter-State Council with the Prime Minister, some Union Ministers and the Chief Ministers and Lieutenant Governors of States and Union Territories as members to deal with various Centre-State and inter-State matters. But here also consensus is required. So few decisions of any major import are achieved and matters can pend for long periods.

MOWR also coordinates with the Ministry of External Affairs on all water related matters involving treaties and interactions with neighbouring countries where rivers flow across international borders.

MOWR is also associated with various inter-State management boards which are inter-governmental bureaucratic arrangements whereby concerned State Governments (and in some cases MOWR) are represented through bureaucrats or engineers (technocrats) in bodies responsible for coordinating the day to day operations as per pre-agreed allocation of canal or river waters in some systems which cover more than one State. These exist only in some cases. While some observers refer to these inter-State management boards as river boards, they are different from the river basin organisations which do not exist but have been advocated in recent years. Such contemplated bodies would be composed of various stakeholder members, including water users, local bodies (both urban and rural), representatives of State Government and the leader of the opposition in the State Legislature.

Other Central agencies associated with the water sector include the Ministry of Rural Development, which provides funds for rural drinking (and domestic use) projects to State Governments. Funds provided by the Rural Development Ministry to States for Employment Generation Program are also used inter-alia for water related construction works. This Ministry and the Ministry for Agriculture have been involved in providing central assistance to the State governments and framing guidelines for CSSs and Central sector schemes related to watershed development projects for rainfed areas. At times the two Ministries have collaborated on framing common guidelines, while at others their guidelines (and the corresponding stated objectives of watershed development) have differed.

In 2006 a National Rainfed Area Authority (NRAA) has been constituted under the aegis of the Ministry of Agriculture, though a number of Ministries had lobbied that NRAA be created under their umbrella. Common Guidelines for Watershed Development Projects as formalised by NRAA in March 2008 have recently been circulated by Ministry of Rural Development to all State Governments.

The Ministry of Agriculture and its attached Indian Council for Agricultural Research (ICAR) which has its Central research stations and sub-stations spread all over the country, is also responsible for stimulating agriculture extension and technology transfer for both irrigated (surface and groundwater irrigation) areas and for rainfed areas, and for agriculture research including for irrigated agriculture. However Agriculture universities are normally set up by State Governments.

The Ministry of Agriculture also operates similar CSSs for propagating drip and sprinkler irrigation for horticulture and for crop husbandry.

The Housing and Urban Development Ministry provides schemes and funding to the State Governments for urban drinking and domestic use water projects.

The Environment and Forest Ministry is involved in view of the *Environment (Protection) Act 1986, Central Water (Prevention and Control of Pollution) Act 1974* and *Forest Conservation Act 1980* which place restrictions on the development of new as well as extension of old water resources development projects in ecologically sensitive areas and accordingly State Governments have to refer many water related works to the Environmental Ministry or its agencies for environmental clearance.

In some form or other additional Ministries, like Shipping, Power and Industrial Development, are involved with management of water resources.

MOWR (and the civil engineers who dominate it and the CWC) aspire that all water related aspects of all Central Ministries be transferred to it, as asserted in a 2003 MOWR document on Integrated Water Resources Development and Management. Recently the Ministry for Panchayati Raj has been claiming that all schemes for rural areas should be brought under its purview.

Before concluding our brief review of water related organisations at Union Government level, mention must be made of the Planning Commission of India. The Planning Commission is a non-statutory body headed by the Prime Minister with a full time Deputy Chairman, full time members in charge of various sectors of the economy, and a well staffed secretariat. Along with the National Development Council (NDC) comprising of Prime Minister and important Central Ministers as well as Chief Ministers and Lieutenant Governors of States and Union Territories and which meets at least once a year, the Planning Commission prepares an Approach to each Five Year Plan, as well as the Five Year Plan itself, and, following a process of detailed consultations with State Governments and Central Ministries, determines the annual plan sizes in term of funds for each Central Ministry and each State Government. Naturally many water related schemes/projects and plan budgets are affected and influenced by this. The Planning Commission also provides project clearance of various schemes and larger projects of Central Ministries for implementation in the States.

2. Water Related Organisations at State Government Level

As already indicated the State Governments are responsible for the actual management of the water sector. State water administrations, known variously as the Irrigation Department (State), or Public Works Department (PWD), or the Water Resources Department in different States, are responsible for the construction, maintenance, operation and management of water storage and surface irrigation projects. There normally is a separate department for groundwater, and another separate department for drinking (and domestic) water which in some States is called Public Health Engineering Department (PHED) which also deals with sanitation. Since water management responsibilities are often held by Ministries dealing with public works, public health or internal water transport, they are lumped together with activities such as road construction and

are commonly referred to as “engineering departments” or “works departments” within the State Government.

The Irrigation Department, by whatever name it has been called, is gradually being renamed Water Resource Department in each State (therefore referred to hereafter as the Water Resources Department). In addition to surface irrigation canal systems and dams as well as flood control works, it now normally deals with allocation of water for alternative uses (irrigation, drinking and domestic use, industrial use, environmental purposes, and leisure related use) and perspective planning of water development and water use within the state as, with growing populations, technological changes in the agriculture and industrial sectors, and changing human lifestyles (all of which lead to increased water demand) and the gradual but sustained change since India’s independence from subsistence farming to commercial farming, more and more regions are getting converted from water surplus areas to water stressed areas. The Water Resources Department also normally has a water (or irrigation) Engineering Design and Investigation Directorate attached to it, and also either a Water and Land Management Institute (WALMI) or Irrigation Management and Training Institute (IMTI) associated with it for capacity building and action research purposes.

The Water Resources Department has also traditionally dealt with inter-State and Centre-State water related matters through a special cell created for the purpose, and continues to do so.

Mention has already been made of PHED and Groundwater Departments. Other State Government departments dealing with water include the Agriculture Department (with State Agriculture Universities having links to it), Rural Development and Panchayati Raj Department, Urban Development and Local Self Government Department, Animal Husbandry and Fisheries Department and Command Area and Water Utilisation Department. The Disaster Management Department is also concerned as in times of droughts the provision of drinking

water for humans and livestock is a component of drought relief, and in times of floods the relief works are coordinated and funded by the Disaster Management Department.

The Industrial Department, Mines Department, and Energy Department interact separately with the Water Resources Departments to get specific quantities of water from canals, lakes, etc. allocated for large projects in their sectors. The Energy Department, through a State Electricity Board or Power Generation Company, is also responsible for the operation of hydro- electric power projects normally located at the sites of dams.

The Environment Department and State Pollution Board have to be consulted for environmental clearance of all water related projects, as does the Forest Department.

At the State Government level each department consists of an Administrative or Secretariat Department headed by a Minister and a Principal Secretary to Government or a Secretary to Government, and one or more Executive or Field Department(s) segmented functionally, whose head of department (HOD) may hold designations like Director, Chief Engineer or Commissioner. In some cases public sector enterprises are also set up. For example some states have Tubewell Corporations, or Land Development Corporations.

The allocation of functions between various State Government departments is governed by Rules of Business which are framed or modified by the Council of Ministers of the State Government.

Since the various State Governments are always short of financial resources as compared to the Union Government, scheme-based financial assistance in the form of CSSs or Central Sector Schemes are looked forward to, and State

Governments tend to give priority to schemes and programmes for which Central Government funds are available to them. This also applies to the water sector and all water related activities. These scheme-related Central funds are in addition to the sharing of taxes etc. between the Union and the States for which separate constitutional provisions exist because those become a part of the States resources by right and are not deemed to be part of any Central assistance to States.

An example of a State Government department in the water sector fully dependent upon a CSS is the Command Area Development and Water Utilisation Department (CAD & WU Department) (this author has worked as Secretary to Government of this department). Since 1974 the Union Ministry of Agriculture, and later MOWR, have been operating a CSS for CAD. The objective is that the irrigation potential created through irrigation works should be optimally utilised throughout the command, or commandable, area of the irrigation project. For this the outlet of the minor canal is linked to each farmer's field through the construction of water courses. Similarly field drains and farm roads are constructed to service each farmer's field. It may be added that a large proportion of farmers in each irrigation command are small and minor farmers with scattered holdings while an outlet in the canal minor may be designed to irrigate five to eight hectares or even more (earlier this area used to be 40 hectares) and thus each water course may feed water to a number of farmer's fields. The CAD program also envisages provision of agriculture extension services and back up adaptive and adoptive agriculture research, tree plantation, and if it is a new area being "colonised" through the irrigation project, or being converted from rainfed or "dry farming" to irrigated farming, then the CAD program may also involve arrangements for input supply and for marketing and storage of agriculture produce, and even for planning and creating new villages and towns, arranging for drinking water, pasture development and livestock breeding, afforestation and roads to connect villages and towns to the irrigated area (this is similar to the "watershed plus" approach being adopted in rainfed areas). In the case of integrated CAD projects the operation and maintenance of the irrigation system

would also be part of the CAD project. CAD also involves propagation of Participatory Irrigation Management (PIM) and the handing over of certain irrigation and water management functions to Water Users Associations (WUAs). While integrated CAD projects are managed fully by the CAD & WU Department and would be discussed in more detail in the next section, for un-integrated CAD projects CAD & WU Department requests concerned departments to take up CAD related works in the concerned project through their respective budgets and staff and itself takes up some core CAD activities, especially construction of water courses and field drains, through its own departmental staff. Perhaps, if CAD assistance under a CSS had not been forthcoming, then many States would not have adopted the CAD approach. The National Water Policy 1987 had advocated that all irrigation projects should adopt the CAD approach and the 2002 National Water Policy also recommends a multidisciplinary approach including CAD.

Another group of activities related to water under CSSs of the Union Ministry of Agriculture and Union Ministry of Rural Development pertains to individual beneficiary programs and employment generation programmes for rural areas. In one state in India, Rajasthan, a special Agriculture Special Schemes Department was created for such schemes (and this author was posted in it thrice: twice as Deputy Secretary to Government and once as Special Secretary to Government). It was later renamed the Integrated Rural Development and Special Schemes Department and now stands merged in the State Rural Development and Panchayati Raj Department. The individual beneficiary programs included helping individual farmers to access bank loans for wells, pump sets, sprinkler systems, field channels etc along with providing government subsidies to small and marginal farmers and those below the poverty line (BPL) to reduce the repayment burden.

For this, minor irrigation schemes are prepared. (It may be noted that the term minor irrigation is used separately both for well-based irrigation based on groundwater, and for the smaller surface irrigation schemes). The minor irrigation

schemes are approved by NABARD for refinancing specific commercial or cooperative banks in specific areas for loans made to individual farmers. The subsidies are released through special project organisations set up at the district level (which would be described further in the next section).

As regards employment generation schemes, the State Government has been getting them implemented through various functionally segregated departments at the state level, or through special project organizations at the district level, or through rural local bodies (PRIs), and some of the employment generation works pertain to irrigation or drinking water.

In India use of the word "watershed" is mostly made in common usage for relatively small catchments in rainfed areas where there are no rivers nor canals, and the word "watershed" is not used to mean "river basin". Watershed development (mostly of watersheds ranging from 40-50 hectares to 250-300 hectares) is another activity which has to a large extent depended upon Central assistance under CSS. The State level watershed directorates evolved from the earlier soil conservation directorates. They were earlier attached to the State Agriculture Department through some of the Central assistance received by them was under Desert Development Program or Drought Prone Areas Program in addition to under programs or schemes of integrated watershed development. A couple of years ago the watershed directorate has been transferred from control of the State Agriculture Department to that of the State Rural Development and Panchayati Raj Department. As a consequence the technical aspects related to appropriate use and treatment of each piece of land (both the common lands and private property of individuals) now receives less emphasis than participatory (and political) aspects during watershed development.

As already indicated earlier in this paper, CSSs of Union Government involve the State Governments providing counterpart funds (matching share) as per predetermined ratios, and implementing the program/scheme as per Union

Government guidelines. Therefore, the State Planning Department, which fixes annual plan budget ceilings for each State Government department including those dealing with water management and water development projects, is another State Government department which influences water management.

3. Water Related Organisations at Sub-State Levels

A) Second Tier of Indian Federalism

The State Government departments and their officers and staff at the State capital, at regional (or divisional) level, at the district level (where each department normally has a district level officer or DLO), and at the sub-district administrative units (sub-divisions and tehsils) and all the way down to the village level (all of whom are transferable from one post to the other, and one area to another, by the State Government department) are part of the second tier of Indian federalism (the first tier being the Union Government and its employees wherever they are posted in the country). Similar is the case of special project agencies (manned by personnel from State departments which may be multi-departmental bodies or single department bodies) created for specific purposes and located at sub-State levels; often at the district level. The DLOs of all water related departments have important roles to play in water management.

The district is the main administrative unit of the State Government for carrying out all its numerous regulatory as well as developmental tasks. Local coordination of the working of DLOs and other functionaries of all the various State level departments is carried out by the District Collector (also referred to as the Deputy Commissioner or the District Magistrate in some States), who is an officer of the Indian Administrative Service posted in a district by the State Government (this author has worked as Collector in two districts). The Collector is both head of the general administration as well as the agent and representative of the State Government in the district and has been so since the days when the

British ruled India, having been assigned a prime position in the local administration as far back as 1786. Through a system of over 70 district level committees he or she coordinates the working of individual departments or sectorally grouped departments in the district. Thus he or she has a significant role in coordination of agriculture and livestock development, industrial development, irrigation and drinking water development, drought proofing of the district, planning of flood protection works and also in preparation of the overall District (Development) Plan. Through the district level bankers coordination committee he coordinates developmental loaning for all sectors including the water sector. He or she is either Chairman or an important member of all special project agencies created by the State Government in the district. In fact for over three decades since early 1970s, the Collector has been Chairman of the District Rural Development Agency (DRDA) which implemented individual beneficiary programs, employment generation programs, well-based minor irrigation schemes, community lift irrigation schemes, and some area development schemes, etc. in the district. Now that the DRDA has been merged into the Zila Parishad, the Collector still continues to play a significant role. In times of droughts or famines the Collector heads the famine relief works in the district which include arranging for drinking water for humans and for livestock in each famine effected village. Similarly in times of floods the Collector heads the flood relief operations. The Collector has certain supervisory powers over PRIs (rural local bodies) and the urban local bodies. Acquisition of private lands or the provision of government lands for all projects including water related projects in the district is done by the Collector who is also head of the "land records" and "land revenue" administration. For each Water Resources Department project in the district, the Collector chairs a meeting of various stakeholders in the form of a water regulation committee once before the start of every crop season to assess the likely water available for the particular season and to determine, on the advice of the irrigation department engineers, when water is to be let into the canals, the number of waterings to be allowed, and the consequent canal running program for the entire crop season. He also coordinates the Water Resources Department's Jal Chetna

Yatra (water awareness marches) within the district aimed at generating awareness about better utilisation and use of water and water conservation efforts. As regards drinking water it is PHED which prepares project proposals, but the Collector gives suggestions about their priority before the State Government decides which projects to sanction. Since the Collector is also responsible for the maintenance of law and order in the districts any potential or existing conflicts over water use have to be tackled from the point of view of law and order by the Collector (with water rights being determined by courts or being dealt with by the water resources department from whose projects water is supplied). If citizens have a grievance regarding canal irrigation, or supply of drinking water, or loaning for an irrigation well/pump set, and the like, while they may approach the concerned DLO or bank branch manager, they are equally likely to approach the district Collector who is responsible for getting public grievances redressed in the district and the Collector thus takes up the grievances with the concerned government agency and monitors the action being taken.

Another important organisation of the State Government at the sub-State level is the integrated CAD project. Certain irrigation projects are taken up to be managed as integrated CAD projects. A single officer heads such a project with officers from Irrigation, Agriculture, PHED, Afforestation, Animal Husbandry, Roads etc Departments being seconded or placed on deputation in such a project. Integrated budgets are received from the State CAD & WU Department and works and other activities fitting into the CAD approach are planned and implemented in an integrated manner within the command area of the irrigation project. Naturally the command area of the project is determined on topographical considerations. Thus it is bound to be different from the existing boundaries of administrative units like the district or its subunits, as well as from boundaries of rural local bodies. An integrated CAD project (like other irrigation projects) may cut across district boundaries and cover areas in more than one district, or it may be confined within a district. The Command Area Development Authority (CADA) normally has the concerned district Collectors, local members of the State legislature, heads of the Zila Parishads concerned, and senior officers of State Government

departments concerned with various components of the CAD project as members of the CADA. For larger integrated CAD projects the head is a member of Indian Administrative Service appointed by State Government as an Area Development Commissioner (this author has worked as both Area Development Commission and as Additional Area Development Commissioner in two CAD projects). For similar projects that are not so large an irrigation engineer, or agriculture officer, or State administrative service officer may be designated as its head by the State Government.

B). Third Tier of Indian Federalism

This tier comprises of rural local bodies, PRIs, (comprising of the Zila Parishad, intermediate Panchayat body, and village Panchayats or Gram Panchayats) and urban local bodies. All the local bodies comprise of elected representatives and government functionaries to carry out the work of the bodies. Before the 73rd and 74th Constitutional Amendments of 1992, which gave these bodies constitutional status, they had statutory status (i.e. they were constituted and governed by Acts passed by each state legislature). Panchayati Raj Acts were passed in various States starting in 1959, while Municipal Acts had initially been passed in the days of British rule. Even today the functioning of these local bodies is determined by Municipality Acts and Panchayati Raj Acts legislated by each State Government. Each local body is independent and there is no hierarchy of local bodies in that a larger local body (the Zila Parishad, say, cannot issue directions to a smaller lower order local body – intermediate Panchayat or Gram Panchayat – within its jurisdiction).

As already indicated State Governments have not shown much enthusiasm for devolving functions to the local bodies. Though the local bodies legally have powers to raise resources through certain taxes or fees, they are reluctant to do so. Thus they tend to depend upon the State Government for funds and functionaries. These local bodies are more keen to receive State Government funds than State

Governments are to receive Central assistance under CSSs since State Governments are capable of functioning without such assistance while PRIs are not. Thus many State Government departments tend to treat them as agencies for implementing their schemes providing funds and detailed guidelines for doing so. Watershed development is one such activity in which Panchayat bodies are associated with implementation. Employment generation schemes like those under a central National Rural Employment Guarantee Act (NAREGA) is another where the State Rural Development & Panchayati Raj Department may provide funds directly to the Water Resources Department, PHED etc for water related works, and also to Panchayat bodies like the Gram (or village) Panchayat. Gram Panchayats are also often used as agencies to undertake construction of employment oriented works as part of famine relief during times of droughts.

However small water bodies below a certain size (may be those which can irrigate up to 40 hectares) are normally transferred to the Gram Panchayat in many states, with larger irrigation projects vesting with the Water Resources Department.

Regarding rural drinking schemes it is the PHED which normally prepares and implements them in consultation with Panchayat Samiti and Gram Panchayat on the one hand and the district Collector the other. Efforts are made to get the Gram Panchayat to take over and manage Traditional Source Schemes (TSS) based on community wells in the village with water being drawn through tubewells, as also to take over responsibility for minor repairs of TSS and of drinking water hand pumps-but the Panchayats often prefer that the PHED does this work.

In fact none of the three tiers of Panchayat bodies have shown much interest in water management activities – preferring instead to attempt gaining some control over field staff of State Government departments in education or health sectors, or to obtaining powers to sanction certain small works to be carried out

with State Government funds. That is not to say that there are no enlightened Panchayat bodies where the elected people's representatives play a positive role.

The local bodies are also involved in the process of preparing District (Development) Plans.

While in some cities/towns the municipal bodies operate urban drinking water and sanitation schemes, more often than not it is the PHED that does so. Moreover, where water has to be moved long distances from rural sources to towns (or even to certain villages), it is only the PHED that is capable of doing so and not the urban local body.

C). Fourth Tier of Indian Federalism

There are certain community-based organizations (CBOs), or user, or beneficiary, groups like Water Users Associations (WUAs), Watershed Committees, Joint Forestry Management Committees. Resident Welfare Associations or Local Residents Committees with regard to domestic and drinking water or urban rooftop rain-water harvesting, which can play a significant role in water management. This author views these bodies as a sort of fourth tier in India's federal structure. In some States WUAs on canal irrigation systems enjoy statutory status as, commencing with legislation in Andhra Pradesh in 1997, they have been constituted under Farmers Management of Irrigation Systems Acts of the concerned States. In other cases such bodies are either registered societies or cooperative societies, or set up by administrative orders, or they may even be informal groups. These bodies or their members either take up small water management tasks themselves or lobby concerned government agencies for improved public service delivery. They function on the basis of the local social capital that they possess as well as the felt needs of members that they can fulfill. Their territorial boundaries are often based upon hydrological or topographical considerations and thus they are seldom co-terminus with boundaries of local

bodies or of the units of general administration. In fact they are normally much smaller. Some proponents of Panchayati Raj want them to be placed under the control of Panchayat bodies. This writer feels that just as PRIs press for autonomy and political space vis-à-vis State government agencies, such "fourth tier" bodies should be permitted their autonomy and space to function on their own.

Non-governmental bodies (NGOs), whether publicly (governmentally) or privately sponsored, have also at some places been involved in some aspects of water management. Supporters of Panchayati Raj refer to them as "parallel bodies" with which PRIs may need to compete.

III. Some Issues of Managing Water in India

It would be appropriate to preface this section by pointing out that in the matter of water resources the right of the government at the State Government level is paramount and has been so since 1866 when government assumed the main role in irrigation development with projects to be constructed by state agencies. Different provisions of the Constitution, as well as central and State acts, have been used towards securing this right. Neither riparian rights, nor prior appropriation rights of private parties including farmers are secured. Because of this, private initiative in water resource development is limited to private lands through wells and tubewells.

From the days of British rule in South Asia/India the policy had been to develop canal irrigation systems for extensive irrigation rather than for intensive irrigation. The available water was spread over larger areas. Such spreading with longer lengths of canals and lower water allowances was more conducive to subsistence farming rather than commercial farming. This strategy has carried over into independent India. The result is that every farmer on every irrigation system feels that he is short of water particularly since today the other conditions are much more in favour of commercial farming even if more water per unit land

may be required for it. This leads to problems between the head reaches of irrigation systems and tail reaches. State Government and the Collectors and district administrations often have to resolve such head-tail disputes, which even have the potential of turning violent. If it is a multi-district project this becomes a dispute between farmers/citizens/politicians of the concerned districts. If more than one State is involved it becomes an inter-State water dispute. The problem can get compounded if the canal systems of a large project take many years to construct. Farmers in the head reaches get accustomed to receiving and using more water than their allocated water allowance. S ubsequently when canals in the middle or tail reaches get constructed and the head irrigators are asked to limit themselves to their allocated water allowance and to forego the additional water they have been using till then so that it can be provided to the downstream farmers, they protest and political agitations can and have occurred. In some cases this has also become an inter-State water dispute spurred by head subsystem farmers in one State and middle or tail subsystem farmers in another.

Another legacy of the British Raj is that the Water Resources Departments evolved from British military engineers being used for such works and they became departments manned by civil engineers (and not even by persons who had studied irrigation engineering/water engineering). This, I believe is different from the tradition in the erstwhile Spanish and Dutch colonies where the irrigation departments were more multidisciplinary in character. The civil engineers in the irrigation departments tended to be uni-dimensional construction oriented functionaries and, exceptions apart, did not get used to interacting with the irrigator-farmers. In fact even till today they feel somewhat constrained and uneasy communicating with agriculture department staff working in the area of the irrigation project though the objective of each irrigation project is irrigated agriculture. The result is that for every water management problem, the Water Resources Department tries to come up with technical or engineering solutions whereas many of the issues may require socio-political interventions. Thus many issues, which could be sorted out by dialogues, negotiations and the involvement

of local water users and other stakeholders, tend to get bogged down in emphasis on technical issues. Similarly existing community arrangements for water management as is the case of many old tank irrigation systems in South India or traditional water harvesting systems in water scarce, drought prone, and desert areas of the country, were overlooked and ignored by irrigation engineers who tried to impose their departmental norms and procedures instead. Thus traditional community managed schemes have tended to languish over time. The Water Resources Department engineers do not show much interest in facilitating genuine Participatory Irrigation Management where WUAs take over canal minors or canal systems and make their own decisions regarding rotational running of canals and operation and maintenance etc for managing the canals system. They would rather that the WUAs limit themselves to working as agents of the Irrigation Departments and undertaking tasks like recovering of irrigation dues, which the engineers find difficult to manage.

Similarly the Water Resources Department engineers are not much enamored with the idea of water development projects being implemented, operated and maintained in a multidisciplinary way as in the case of integrated CAD projects. Such multidisciplinary water project implementation is required not only because today such a project needs to cater to the requirements of multiple uses of water (and not just to irrigation) but also because, unlike in many developed western countries where the other physical and social infrastructure already exists, in India the development of a water project may have to be undertaken hand in hand with the development of roads, schools, hospitals, storage and marketing facilities and other area development in the command area.

In most cases while proposing new irrigation projects provision is not made for controlling possible water logging and soil salinity by providing drainage (surface or subsurface, horizontal or vertical). This may be due to a lack of understanding by irrigation engineers. But it reduces projected costs leading to higher benefit cost ratios enabling easy sanction of irrigation projects. Later when

water logging or salinity occurs reducing agriculture production, the curative measures may be more costly and difficult than preventive measures. Drainage needs to be provided for at the initial planning stage in each irrigation project.

Traditionally the two departments at the State level concerned with the availability of water, that is the Water Resources Department and Groundwater Department have not had much coordination and interaction. Thus not only conjunctive use of surface and groundwater has been more a slogan than actuality in practice, but assessments of water availability in each region for planning its use has not been sufficiently coordinated. Harnessing and development of surface water is done mainly by the Water Resources Department, though the Watershed Department, PHED and in the case of much smaller structures PRIs and District Rural Development Agency have also been involved. Harnessing groundwater is mostly done by individual farmers, though the PHED also uses a lot of groundwater for both its urban and rural drinking water schemes; the Groundwater Department undertakes exploration work, periodic surveys of availability of groundwater supplies in different blocks and projects future groundwater availability as per planned development and use.

At times individual farmers, PHED and entrepreneurs wanting water for industrial use all dig wells in the same area, and community lift irrigation projects may also be planned in the same area, leading to over-exploitation of groundwater. As the administration currently stands, no government department can monitor this.

The Water Resources Departments currently responsible for water resources planning at the State level seem to have an unintentional, but nonetheless real, in-built bias towards the planning and development of the resources for irrigation and in favour of those who receive surface irrigation. The other water uses such as industrial water supply, domestic and drinking water supply, water needed for environmental protection, or for maintaining water quality, tend to get neglected in

such planning. One reason for this could be that in the first half of the twentieth century, or even earlier, when the traditions of India's Water Resources Departments were being set, it was often assumed that the irrigation water received by irrigators from surface irrigation projects could also be used by them for drinking and domestic purposes and in those days the levels of industrialisation and urbanisation were low. Thus separate water provisions for activities other than irrigation were normally not made in surface irrigation projects (though some small dedicated drinking water projects to supply nearly towns were sometimes constructed separately). In those days groundwater was a limited option as electricity was mostly confined to urban areas and loaning and institutional finance arrangements for wells and pump sets were lacking. So Water Resources Departments got accustomed to concentrating upon surface irrigation projects and irrigation use of waters. This tendency persists to the present day.

Nowadays most State Governments give top priority to drinking water. Thus many irrigation projects have to reduce the water they earlier provided for irrigation and provide it to the PHED for drinking water. In some cases some projects earlier constructed for irrigation have had to be totally handed over for drinking and domestic water use. In fact drinking and domestic use water is not supplied separately but is supplied together jointly for both purposes.

The State Government departments are expected to simultaneously look after tasks of development, management and regulation. In practice the departments concerned tend to pay more attention to development rather than to management, and are by and large ineffective in regulation. Development of projects, the managing of service delivery of water, and water resources management involving multiple uses need to be looked at separately even if the same department is involved in all three.

Panchayats taking up small local works do not refer them to the Water Resources Department or Groundwater Department from the point of view of

macro planning of the water resource for the area. With water stress or water scarcity increasing from year to year, the tendency of villagers becomes one of trying to tap and store all water, rainfed or from surface flows, within the village. One hears talk along the lines of "not a single drop of water should be permitted to flow out of the village" (in the Indian land management system a village is a certain area of land and not the main habitation in that area). Thus local Panchayats, or even groups of farmers, construct small anicuts or check dams to block the flow of water and to store it on the spot whereby groundwater levels also increase. However by such blocking of flows, the downstream dams, reservoirs, rivulets and rivers are all adversely affected.

Such unplanned local development can have consequences that cannot be acceptable from the macro area point of view. The State Governments have often had to get such anicuts or small check dams and similar water harvesting structures destroyed since otherwise they may be blocking the catchments of downstream reservoirs or causing downstream rivers to dry up.

However the views expressed by the villagers as indicated in the previous paragraph are similar to the philosophy of State level leaders who do not want any water be allowed to flow from their State to a downstream State because according to their thinking such water has been wasted. But the downstream State accustomed to receiving such waters for centuries is bound to protest at any present day attempts to divert or block such waters. Many of the inter-State water disputes result from such thinking. In some cases particular governments have even tried to evade honouring inter-State agreements to provide certain quantities of water in certain river-systems or canals to downstream States.

In the 1950s and 1960s many soil conservation works used to be carried out along the field boundaries of farmers' fields rather than on the basis of topography. One of the objectives of watershed works was to overcome this where-by treatments based upon topography and soil conditions along with appropriate use

of each patch of land (whether commonly owned or private) became components of watershed development in rainfed areas. With the recent transfer of watershed directorates in some States from the State Agriculture Department to the State Rural Development & Panchayati Raj Department this has come under threat. The Gram Panchayat which is involved in implementation of watershed works may find local agriculturists pressurising it to revert to soil conservation works along the boundaries of farmers' fields rather than cutting across such fields on topological considerations. If they succeed the very purpose of the watershed of approach will be lost.

The State Agriculture Departments ensure provision of agriculture extension messages for farmers and these contain some aspects of what this author likes to refer to as "irrigation extension" in that on-field water application techniques and optimum water quantities and appropriate times for water application for various different crops are covered. But there are no agencies assigned the task of providing extension messages for water resource development and management: there is no government agency involved in technology transfer and providing a recommended package of practices to the various water users: methodologies of managing and operating canals, optimal use of drinking and domestic water including water conservation, efficient use of water for industrial purposes including control of water pollution and of industrial effluents in water. At least irrigation extension on the lines of agriculture extension should be provided through the Water Resources Department or CAD & WU Department.

State Government departments have benefited from funding from externally aided projects – both multilateral and bilateral. Aid has been received for watershed development, tank rehabilitation, CAD, drainage, dam safety, modernization of existing surface irrigation schemes, rural electrification which facilitates groundwater exploitation, agriculture credit including for wells and pump sets, flood control, propagation of Participatory Irrigation Management, State-wide Water Resources Consolidation projects, and multifaceted Agriculture

Development Project etc. However, the Constitution permits only the Central Government to deal with foreign agencies for such aid. The Department of Economic Affairs (DEA) in the Union Ministry of Finance is the nodal agency for channeling all such aid to the States. It enhances the role of the Union Government in allocative decisions. While DEA can take the expert advice of the concerned Central Ministry when deciding as to which foreign loaning or aid agency should link up with which sector in which State, it can never have the sort of feel for ground realities in a particular sector in a particular State in the manner that the concerned State departments have.

Right from the time that the Constituent Assembly was framing India's Constitution, there has been a view that the Union Government should be able to play a more effective role in water management. Thus from time to time the suggestion is renewed that water should, through a Constitutional Amendment, be shifted from the State list to the Concurrent list of the Seventh Schedule of the Constitution which would enable both the Central Parliament as well as State legislators to legislate on water related issues. This issue also comes up in connection with the fact that the National Water Policy of 1987, or the subsequent one of 2002, is not binding upon the States and consequent suggestions that it should be possible for Parliament to, in the interest of better water management, enact a National Law in this regard which would be binding upon the States. It can be debated whether this would be desirable. However, while perhaps such a Constitutional Amendment may have been feasible in the 1950s or early 1960s when the same political party was in power at the Union Government and State levels, today when different parties or coalitions are in power in different States or in the Union, and members of the same political party often find themselves on different sides on inter-State water issues, such an Amendment would be virtually impossible. The country has to live with the existing constitutional provisions as they exist.

As it is, through CSSs and the fact that external aid is routed through the Central Government, as well as the requirement of getting larger projects technically cleared from CWC, the Union has increased its influence over the States as regards water. Such a trend is also visible in other sectors other than water – but politically a trend of State Governments asserting themselves vis-à-vis the Central Government is growing.

It may be added, that just as many advocate that the State Government Water Resources Department should be made more multidisciplinary in character, one has started coming across writings suggesting that the CWC be restructured from a technical agency of engineers into a multi disciplinary agency.

We end this section with the comment that while undertaking water development and management there is a need to see irrigated areas (surface or groundwater) and rainfed or dry farming areas (both of which cut across village Panchayat, or district, or regional boundaries) as part of one interrelated continuum. Unfortunately this is not always done.

IV. Inter-State Water Sharing and Disputes

Normally any examination of water management in the federal context in India would start by looking at disputes between States on sharing of waters, and the federal and constitutional arrangements to handle them. This author has chosen to deal with this last, because otherwise there is a tendency to down play or even to ignore much of what has been commented upon earlier in this paper, while the issues commented upon in earlier sections are also relevant and significant.

Except for two smaller basins, 16 out of India's 18 major basins serve more than one State and interstate basins drain more than 90% of the geographical area of India. Except for the Brahmaputra river basin, all of India's major river basins are water stressed, if not water scarce, keeping in mind per capita water availability as per the 2001 Census. Co-sharer states may have disputes over

regulation of flows (water being used by upstream State vis-à-vis water being permitted to flow to downstream State for use there, or further downstream in a third State), sharing of costs and benefits of water development projects, or issues when project affected persons are primarily in one State and beneficiaries in another. The Union Government sees such disputes/conflicts as stumbling blocks in utilising the full potential of all water in each river basin. Thus, of late, the Union Government has shown interest in having a greater say in pursuing inter-State river development. The States consistently resist such moves as what they see as attempts to subvert their rights.

As already pointed out, the right of the State actually means the rights of the State Government and not direct rights of water user stakeholders within the States.

When States attempt to undertake developments within an inter-State basin, then inter-State problems and disputes can often crop up. Negotiations amongst State Governments leading to inter-State agreements have been a solution from pre-independence days when the British were ruling. As of 2000, 58 inter-State agreements (bilateral or multilateral) were in place: 39 for joint projects about sharing costs and benefits, and 19 about water sharing. However negotiations leading to water agreements can also have problems. In some cases groundwater may not have been factored into the agreement. At times agreements between States in a shared sub-basin leave out other co-basin States further downstream who may subsequently object. States may not be too keen to honour agreements entered into, or may change their mind about the water required (desired) by them. Creation of new States by dividing existing ones can also complicate matters.

The recent creation during the present decade of three more States by dividing larger States could change the nature of existing inter-State differences or create new inter-State dispute. The redrawing of existing State boundaries or creation of more, smaller States in the future cannot be ruled out.

States have not been willing to surrender any of their rights to river basin organisations. The *River Boards Act 1956* enacted by Central Parliament under Article 262 of Constitution provided for creation of boards by the Union Government in consultation with the State Governments to advise on the integrated development of inter-State basins. It has remained a dead letter with no board being created. Similarly no formally adopted declaration of water sharing principles has been possible at the national level. Attempts were made in the 1990s at preparing a draft statement of such principles and it went up to the NWRC. But the various States could not agree – and even today such agreement appears unlikely. Each State Government has its own ideas about what is desirable in view of its own perceived situation, and politically no State appears to be willing to indulge in any give or take on such water sharing issues.

In earlier sections of this paper it has been indicated why irrigators on irrigation commands invariably feel that they are short of their requirements of water and why State Governments feel possessive about water flowing through their State. As Iyer (2007) has pointed out, what is occurring is a competitive unsustainable demand for water. Supply creates demand and necessitates more supply. Availability of water leads to adoption of more water intensive crops and cropping patterns that require more water. There is a desire to expand the area under irrigated agriculture on grounds of economic growth. Increased industrialisation and urbanisation and increases in population also enhance the demand for water. Environmental requirements for water were less universally understood in the past and they also add up to the increased requirement for water. So far, by and large, States have been managing through increased exploitation of both surface and groundwater. There is some scope for more efficient management and utilization of water and this can yield some water for various requirements. But gradually demand is becoming unsustainable in more and more areas, which are becoming water stressed.

This also has an impact upon proposals for inter-basin water transfers through long distance water transfer. The coalition that was in power at the Union Government level between 2000 and 2004 had advocated a countrywide Inter-linking of Rivers Project (ILR). One of the justifications set forth was that water could be transferred from ”surplus” areas to “deficit” areas. But without any pre-agreed criteria (and investigations and assessments as per such criteria which are accepted by all) what is surplus and what is deficit becomes subjective. Should future requirements be considered? In fact, in the cases where inter-State agreements have been entered into, the State Governments have gone in for huge investments in water infrastructure to ensure that they can use their water shares and not allow other States to claim such water on the grounds that the concerned State is not using all the water as per its share and therefore should free it for other States. But in all such cases the perception of being water surplus or water deficit is more important than the status of water potentially available in good years or in lean years. Perhaps every State Government feels that by and large they are not surplus (even if during the monsoon or rainy season some parts of the State may be experiencing floods). Thus it is difficult to envisage any State Government agreeing to water being transmitted out of the State to other basins or States through interlinking of rivers.

What happens when a dispute occurs between States? The *Inter State Water Disputes Act 1956* enacted as per Article 262 of the Constitution provides for an aggrieved party to ask the Union Government to refer a dispute to a tribunal. A Water Disputes Tribunal comprising of a sitting judge of the Supreme Court and two other judges from the Supreme Court or the State level High Court is appointed. It can choose assessors and experts to advise it, and its Award once given is final being beyond the jurisdiction of courts.

The Act has been amended in 2002 to set certain time limits to speed up the work of the tribunal and to provide the Tribunal’s decisions the same force as an order or decree of the Supreme Court.

Five Inter-State Water Disputes Tribunals have been set up since the enactment of the Act. In the cases of Godavari and Narmada the Tribunal Awards can be regarded as successful, though in the case of Godavari a number of inter-State and bilateral/trilateral agreements amongst the concerned States during the tenure of the Tribunal, and in the case of Narmada informal discussions between the States under the leadership of the Prime Minister over a period of three years which ran in parallel to Tribunal proceedings and led to prior agreement on allocation of waters between the States and on the height on the Narmada dam, facilitated the acceptance and implementation of the Awards. The Cavery dispute dates back to 1892, and neither the Interim Award nor Final Award of the Tribunal has been received well. In the case of Krishna the Tribunal set up in 1969 gave its award in 1976 but the dispute continued to fester and a new Tribunal had to be set up in 2004. The Ravi-Beas Award has been subsequently contested by one State – Punjab.

In fact increasingly States are becoming resistant to compliance with Awards of Tribunals despite express provisions in the Constitution. Issues of interpretation are raised and there is no mechanism to enforce implementation.

Some other criticisms of the procedure as per the *Inter-State Water Disputes Act* (as suggested by Iyer 2007) are

(a) Adjudication may not be the best or most appropriate means of settling such disputes. A negotiated agreement, with the assistance of mediation or conciliation, may be better;

(b) Inter-State Water Disputes Tribunals do not have a formal statement of water sharing principles to guide them in their work;

(c) The adjudication system under the Act is cumbersome and dilatory;

(d) The proceedings are adversarial and divisive as well as costly. Each side engages eminent counsel, makes maximal claims and fights every inch of the way. The procedure precludes a problem solving approach, or efforts towards the

composition of differences. The parties (States) play the role of disputants and responsibility for resolution is solely that of the judges; and
(e) one or more parties may be left with a sense of injustice or grievance with the Award, for which there is no remedy.

However the Act does not insist that a Tribunal follow the court style of adversarial proceedings and nothing prohibits the Tribunal from adopting a consultative, interactive, fact finding, solution exploring procedure before giving its judicial decision. However, alternate procedures, which could prove more effective, do not appear to have been suggested in a perusal of existing literature.

The various State Governments may be expected to become increasingly aggressive in pushing their demands for more and more water at the cost of other States in the basins.

As already indicated in the preceding section, amendments to the Indian constitution are becoming politically more and more difficult to enact as there is not enough consensus between contending political parties in the various States and at the Union level, where often a coalition of political parties with slim majorities in legislatures may be in power. Further, India's Supreme Court has held that the basic features of India's Constitution can not be changed through amendment of the Constitution. Thus the federal features of the country can not be changed and any improvements in water management have to be affected within the limits set up by India's federal structure. Thus adoption of Integrated River Basin Management may prove very difficult since State Governments (who have demonstrated great reluctance at delegating powers and functions to local bodies) may not be willing to give up their control, powers, authority and rights to any river basin organisation. Even taking up Integrated Water Resource Management is proving difficult in actual practice.

V. Conclusion

We have, in this paper looked at various aspects of managing water in India within a federal framework. The pressure on water resources is growing day by day. Populations are increasing. Lifestyle changes have led to per capita demand for water rising. As society moves from the earlier agrarian to the now more complex, multi-sector, societies and as technologies open up new possibilities of economic activity, the requirements for water grow. Many of the water sources – surface or groundwater – which were among the comparatively easier to tap have already been developed and development of new water sources now proves more costly and may involve complex technical, environmental and even political issues which need to be sorted out. Much of the water related infrastructure developed in the 19th and 20th centuries requires major renovation, modernisation and maintenance. Gradually competition for water, agitations and even conflicts over sharing water have started emerging.

Whether it is storage and distribution of water through canals, pumping of groundwater, or rainwater harvesting and watershed development, all have their differing challenges to overcome.

The entire issue of governance in the water sector and management of water resources at State district, water development project, and local level needs to be looked at afresh along with reviewing the role that the Union Government plays, so that we in India have systems that work to resolve the emerging issues.

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Table 1: WATER RESOURCES POTENTIAL IN THE RIVER BASINS OF INDIA

Sl. No.	Name of the River Basin	Average Annual Surface Water Potential Km^3	Estimated Utilisable Flow Excluding Ground-water Km^3	Total replenishable groundwater resources Km^3	Population in 1991 millions	Per Capita Available Surface Water m^3	Per Capita Surface and Groundwater m^3
1	2	3	4	5	6	7	8
1	Indus (up to Border)	73.31	46.00	26.49	41.90	1750	2382
2	a) Ganga	525.02	250.00	170.99	356.80	1471	1951
	b) Brahmaputra, Barak & others	585.60	24.00	53.91	35.24	16617	18147
3	Godavari	110.54	76.30	40.65	53.98	2048	2801
4	Krishna	78.12	58.00	26.41	60.78	1285	1720
5	Cauvery	21.36	19.00	12.30	29.33	728	1148
6	Pennar	6.32	6.86	4.93	9.70	652	1160
7	East Flowing	22.52	13.11		23.60	954	
	Rivers between						
	Mahanadi &						
	Pennar			18.22			831
8	East Flowing Rivers between Pennar and Kanyakumari	16.46	16.73		45.20	364	
9	Mahanadi	66.88	49.99	16.46	26.60	2514	3133
10	Brahamani & Baitarni	28.48	18.30	4.05	9.77	2915	3329
11	Subernarekha	12.37	6.81	1.82	9.46	1308	1500
12	Sabarmati	3.81	1.93		10.58	360	1120
13	Mahi	11.02	3.10	18.42	10.48	1052	
14	West Flowing	15.10	14.98		22.10	683	
	Rivers of Kutch,						
	Saurashtra						
	including Luni						
15	Narmada	45.64	34.50	10.83	14.70	3105	3842
16	Tapi	14.88	14.50	8.27	14.80	1005	1564
17	West Flowing Rivers from Tapi to Tadri	87.41	11.94		25.80	3388	
18	West Flowing	113.53	24.27	17.69	32.60	3483	3744
	Rivers from Tadri						
	to Kanyakumari						
19	Area of Inland drainage in Rajasthan Desert	NEG.			7.10		
20	Minor River Basins Draining into Bangladesh & Burma	31.00			2.10	14762	14762
	Total	1869.35	690.31	431.44	842.62	2218	2731

Source: Theme Paper on Water: Vision 2050 AD, Indian Water Resources Society, 1999.