

MORE DROPS FOR HYDERABAD CITY, LESS CROPS FOR FARMERS

**INSTITUTIONS, POLICIES AND INTERSECTORAL WATER
REALLOCATIONS IN ANDHRA PRADESH, SOUTH-INDIA**

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Abstract

The present surface water rights system in India, further institutionalized in State water laws enacted over the last decade, confers to the Government of Andhra Pradesh (AP) full powers for reallocating water between water sectors. To maintain its vested interest, the Government of AP keeps tight control over the AP Water Development Corporation set up in 1997 and the AP Water, Land and Trees Authority constituted in 2002. The main implication for Hyderabad of this overwhelming role of the State has been the politicisation of the process of augmenting the city water supply, further accentuated by regional divides in Andhra Pradesh and by politics of contestation. Within this political climate, water supply to Hyderabad has been constantly contested and delayed, and the city was on the brink of a major crisis in 2003 when the Singur Reservoir went almost dry. Government control over the supply of water to Hyderabad also includes control over the Hyderabad Metropolitan Water Supply and Sewerage Board (HMWSSB) which is in charge of urban water supply and sewerage. This strongly restricts the ability of the HMWSSB to put forth necessary but unpopular urban water reforms such as increases in the water rates to cover infrastructural developments and maintenance costs. While dealing with similar problems and increasing water scarcity, the South-India State of Maharashtra has recently adopted another approach. The water law has been adjusted in such a way as to allow farmers to transfer their water rights, and a Water Authority that can supposedly operate autonomously from the Government of Maharashtra has been set-up. The reform in Maharashtra represents an interesting option for dealing with agriculture to city water reallocations though its effectiveness still needs to be tested against the outcomes of its actual implementation.

Keywords: Andhra Pradesh, Hyderabad water supply, hydropolitics, intersectoral water reallocation, Maharashtra, water institutions, water law reform, water markets, water rights

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"If the mountain won't come to Mohammed, Mohammed must go to the mountain"

1. INTRODUCTION

Because water had become scarce in Golconda, Sultan Muhammad Quli Qutb Shah created Hyderabad in 1591 along the banks of the Musi River and moved there with his subjects.¹ But these times are over, and in the last decades the growing water needs of Hyderabad have been at least partially met by tapping distant sources already committed to the agricultural sector. The mountain eventually went to Mohammed.

Global urban population growth, but particularly in developing countries, is happening at an unprecedented rate. The world population rose from 750 million in 1950 to 2.9 billion in 2000, and the number of people living in urban areas has equalled the rural population in 2007, and is on the way to reaching 60 per cent by 2030.² The sustainability of such a vibrant growth is contingent upon the availability of sufficient water for covering domestic, commercial, industrial, environmental as well as other minor demands. If on the one side the urban demand for water is growing, on the other the availability of the resource has shrunk over the last decades due to massive diversions as a response to agricultural needs. As hydrologists like to put it, many river basins around the world are reaching the stage of closure, which occurs when all available water in the basin is utilized. Reallocating water then becomes necessary, for instance when a particular user such as a city wants to increase its water withdrawals. Under these conditions, water conflicts are likely to develop, and appropriate institutions that provide rules and policies and that ensure enforcement of these, and organisations responsible for reallocating water between users need to be put in place.

The case of Hyderabad, capital of the State of Andhra Pradesh (AP) in South-India, is exemplar of the challenge represented by sustaining a rapid urban growth in a water-scarce environment. The city has grown on average at a rate of 2.4 per cent from 1991 to 2001, rising from 2.5 to 5.5 million³, and is expected to reach 13.6 million by 2021. Over the last three decades, water has been brought to the city from the Musi River initially and further on from the Manjira and Krishna Rivers. In the latter two cases, the Government of AP has administratively reallocated water from the agricultural sector to Hyderabad.

¹ M. A. Nayeem, *The Splendour of Hyderabad. The Last Phase of an Oriental Culture (1591 - 1948 A.D.)* (Hyderabad: Hyderabad Publishers, 2002).

² United Nations, *World Urbanization Prospects: The 2001 Revision* (United Nations Population Division, 2002).

³ K. C. Sivaramakrishnan et al., *Handbook of Urbanization in India* (New Delhi: Oxford University Press, 2005).

Intersectoral water reallocation is also the main focus of this paper, which builds upon the existing literature and empirical findings of research conducted by the International Water Management Institute in Hyderabad. This article illustrates the main shortcomings of the Government-sanctioned water reallocation from the agricultural sector to Hyderabad, and notably the politicisation of the decision-making process and the delays in increasing the city water supply. It further highlights how the recent water law reforms in AP have tended to strengthen the powers of the Government over surface water resources, and suggests that reforms decentralizing powers and allowing water users to trade their water rights, like those recently introduced in the adjoining State of Maharashtra, might provide for a better institutional framework for regulating intersectoral water reallocations.

After having examined the theoretical tenets of intersectoral water reallocation, this paper reviews the main lines of the history of Hyderabad water supply, the organisational set-up of the city water supply and sewerage systems, as well as the recent urban water conservation and reuse policies. The following section briefly presents some aspects of the water law framework in India, and particularly how surface water rights are vested within State Governments; and in Andhra Pradesh, where over the last decade three water-related Acts have been passed. The main shortcomings of the present intersectoral water reallocation mechanism and their relation with the statutory powers over water vested in the Government are then discussed, and the case of Maharashtra, where a different approach has been followed in water law reform, is also set forth for comparison purposes. The article concludes by drawing the main lessons from the study of Hyderabad intersectoral water reallocation, and notably the drawbacks for intersectoral water reallocations of vesting Governments with absolute powers over surface waters.

2. THEORETICAL TENETS: WATER SCARCITY, INTERSECTORAL WATER COMPETITION, AND INSTITUTIONAL REFORMS

Building on the work of Keller et al.⁴, Molden et al.⁵ present a tri-phased model of river basins development. According to the model, in the beginning of the development of a river basin, water supplies largely outstrip the demand; dams are constructed at the most convenient locations; and the quantities of water used for domestic purposes are relatively modest when compared against the utilisation in other sectors, particularly irrigated agriculture. In the second phase, successive increases in the consumptive use of water lead to sporadic resource shortages, particularly during dry seasons, and developing new resources requires conspicuous financial investments since the most convenient locations have already been exploited. Eventually, water becomes chronically scarce and the basin, once it reaches its most advanced phase of development, is said to become closed and all the water resources available in the basin are utilised by established water users. At this stage, reallocation is necessary for meeting the demand for water of additional users or for the priority based increasing of supply to existing ones. Efforts are

⁴ Jack Keller et al., 'River Basin Development Phases and Implications for Closure', 33 *Journal of Applied Irrigation Science* 145 (1998).

⁵ David J. Molden et al., 'Accounting for Changes in Water Use and the Need for Institutional Adaptation', Paper presented at the Intersectoral management of river basins, Loskop Dam, South Africa, 16-21 October 2001.

then directed at reallocations towards to the most economically valuable use; and new institutions are needed to address intersectoral competition and manage river basin resources in an integrated manner.⁶ Though simplified and only capturing the outlines of the complex and multifaceted development of a river basin, the model presented above clearly depicts the changing relationship between rivers and their water users.

Over the last decades, water withdrawals to satisfy the needs of the agricultural sector have brought about a significant decrease in water availability in many river basins around the world. Growing cities are today competing for a share of this water, and intersectoral reallocations from the agricultural to the urban sector are increasingly taking place. The extent of this phenomenon, as well as its complexity, have provided a fertile ground for the emergence of an area of research specifically dealing with water reallocation mechanisms, notably from irrigated agriculture to urban areas. Reasons why water is transferred out of irrigated agriculture are primarily due to the fact that the agricultural sector has traditionally received the lion's share of all the water diverted from rivers (around 70 per cent worldwide⁷), and it is blamed of wasting water since only a small fraction of the water diverted is actually used by the crops for their growth.⁸ Moreover, it is reckoned that even small increases in the efficiency of irrigated agriculture might free enough water for entirely covering the present and future urban needs.⁹ These aspects have generally been put on the table as justifications for transferring water out of the agricultural sector. Furthermore, in order to reduce the costs of urban water supplies, cities often exploit existing irrigation water reservoirs instead of going for new ones, thus curtailing the supply that was formerly available for crop production.

Water is generally reallocated between the agricultural and the urban sectors through competitive markets or through administrative procedures.¹⁰ The mechanism in vogue depends essentially upon the way water rights are defined. Basically, in market systems users hold property rights over water, so that they can decide to permanently or temporarily transfer their right according to competitive market forces; whereas in the administrative allocation water rights are vested within the State, and users are only entitled to use the resource they are provided with. Both mechanisms present advantages as well as shortcomings. Administrative allocation is notably supposed to better taking into account equity aspects, as resource supply to the poorest section of the population, and to exercise a tighter control over reallocation third-party effects as modifications of return flows (i.e. the water not actually utilized after diversion that returns in the natural system). On the other hand, it is well known for instance that administrative allocation

⁶ François Molle, *Development Trajectories of River Basins. A Conceptual Framework* (Colombo, Sri Lanka: International Water Management Institute (IWMI), 2003).

⁷ United Nations, *Water for People, Water for Life. Executive Summary* (Paris: United Nations, 2003).

⁸ World Water Commission, *A Water Secure World: Vision for Water, Life, and the Environment.* (The Hague: World Water Vision, 2000).

⁹ James Winpenny, *Managing Water as an Economic Resource* (Routledge, 1994).

¹⁰ Ariel Dinar et al., *Water Allocation Mechanisms. Principles and Examples* (Washington, DC: World Bank, 1997).

provides little or no incentives for water conservation¹¹, that the decision-making process is often highly politicized, and that water is reallocated without proper compensations for those that are forcibly deprived.

Because of these and other shortcomings, some scholars have advocated the reform of water institutions so as to enable the shift from administrative to market based water allocation, supporting their arguments by successful (or at least deemed as such) cases as reforms undertaken in Chile, Mexico or Australia.¹² Nevertheless, though such reforms appear necessary for regulating the reallocation of water among users in situations of scarcity, they entail high transaction costs notably for the setting up and enforcement of new legal and institutional frameworks. Moreover, because of the high strategic value of water and the uncertainties in predicting the outcomes of reforming the water law, Governments have in general been adverse to give up their monopoly over the resource.¹³

Bruns et al.¹⁴ have underscored the paramount importance of the time factor when reforming water institutions. Notably, reforms can not be rushed through, and they must be initiated at the appropriate moment in time. The importance of getting the time right is illustrated by the failure in reforming the water law in countries like Sri Lanka¹⁵ and Peru.¹⁶ Moreover, water rights reforms should be accompanied by changes such as the creation of forums to negotiate agreements and rules, the establishment of arrangements to clarify rights and resolve disputes, and the implementation of a routine mechanism for permanent and temporary transfers.

3. HYDERABAD WATER SUPPLY

3.1. Historical context

Since its creation in 1591, Hyderabad used to rely on water impounded in tanks as well as on groundwater tapped through shallow dug wells. In the beginning of the 20th century, the 7th Nizam of Hyderabad H.E.H Osman Ali Khan commissioned the construction of two reservoirs approximately 8 km upstream of the city, namely Osmansagar on the Musi River, and the Himayatsagar on the Esi (see Figure 1).

¹¹ Ruth S. Meinzen-Dick and M. S. Mendoza, 'Alternative Water Allocation Mechanisms: Indian and International Experiences', 31 *Economic and political weekly* 25 (1996).

¹² Mark Rosegrant and Renato Gazmuri Schleyer, Tradable Water Rights: Experiences in Reforming Water Allocation Policy (Washington D.C.: Irrigation Support Project for Asia and the Near East, 1994) and Charles W. Howe et al., 'Innovative Approaches to Water Allocation: The Potential for Water Markets', 22 *Water Resources Research* 439 (1986).

¹³ Paul Holden and Mateen Thobani, Tradable Water Rights (Washington, DC: World Bank, 1997).

¹⁴ Bryan Bruns et al., 'Reforming Water Rights: Governance, Tenure, and Transfers', in Bryan Bruns, Claudia Ringler and Ruth Meinzen-Dick eds, *Reforming Water Rights: Governance, Tenure, and Transfers* 283-317 (Washington DC: International Food Policy Research Institute, 2005).

¹⁵ Samad Madar, 'Water Institutional Reforms in Sri Lanka', *Water Policy* 125-40 (2005) and H. M. Gunatilake and Chennat Gopalakrishnan, 'Proposed Water Policy for Sri Lanka. The Policy Versus the Policy Process', 18 *Water Resources Development* 545 (2002).

¹⁶ Paul Trawick, 'Against the Privatization of Water: An Indigenous Model for Improving Existing Laws and Successfully Governing the Commons', 31 *World Development* 977 (2003).

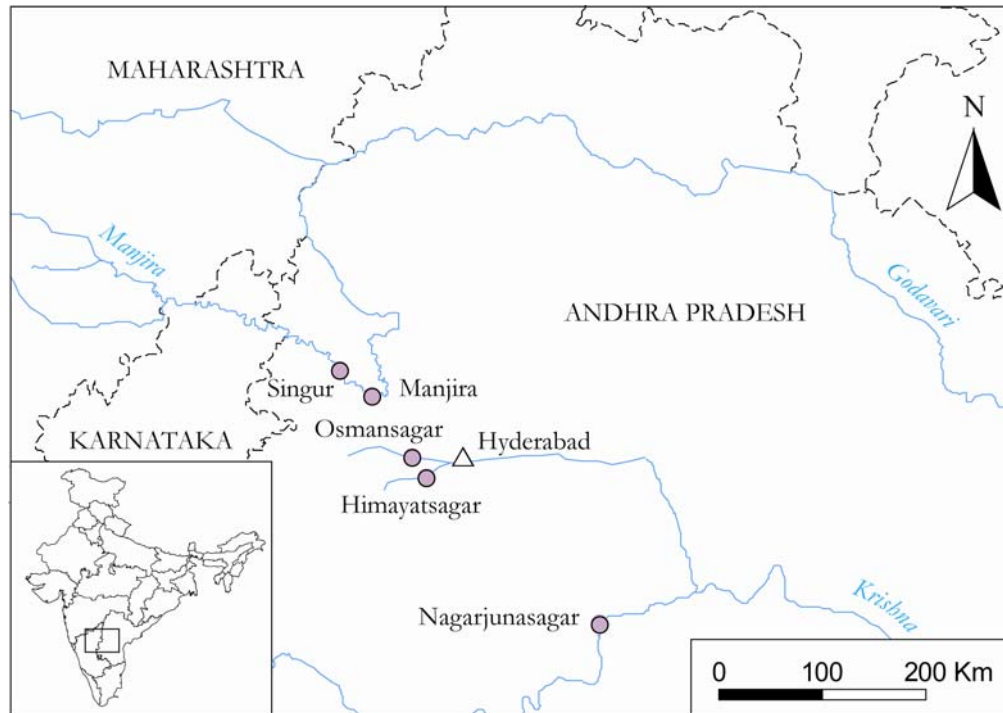


Figure 1: Hyderabad water sources

These two water works provided for protection against the recurring floods that used to hit Hyderabad, and for a supply of 205,000 m³ of water per day. The quantity of water conveyed to the city was further increased in 1965 and again in 1982, by bringing water from the Manjira Barrage across the Manjira River.

In 1972, the Government of AP constituted an expert committee in charge of recommending options for substantially increasing Hyderabad water supply. The committee recommended the transfer of water from the Krishna River.¹⁷ Further, in 1975 and 1978, Maharashtra and Karnataka signed two separate agreements with AP, allowing the latter to draw 113 Mm³ of water per year from the Manjira River for Hyderabad through the construction of a new reservoir. The option of taking water from the Krishna River was then put aside, and according to the interstate agreements AP built the Singur reservoir on the Manjira River, and started transferring water from there to Hyderabad in 1991. Nevertheless, before completion of the Singur project it already became apparent that the Manjira River transfer project would not be sufficient to keep pace with the demand of Hyderabad's expanding urban population and industrial sector. Therefore, in 1986 the Government of AP appointed a second expert committee which recommended the transfer of 467 Mm³ from the foreshore of Nagarjunasagar reservoir on the Krishna River. Carrying water from the Godavari, that is the other major river of AP, was not deemed convenient or cost effective since it is located at a greater distance as compared to the Krishna.

¹⁷ Government of Andhra Pradesh, Report of the Committee on Drawing Additional Water to Twin Cities from Srisailem or Nagarjunasagar or Other Projects (Hyderabad: 1973).

Endorsing the recommendations of the expert committee, The Telugu Desam Party (TDP) that was then heading the Government of AP issued a Government Order in 1988, administratively sanctioning the increase of Hyderabad water supply from Nagarjunasagar. This decision to convey water to the city from the Krishna, the first ever taken by a Government in AP, was vehemently opposed by Members of the Legislative Assembly (MLAs) belonging to the Indian National Congress (INC) that was in opposition at that time. Protests were conducted in the Legislative Assembly, and the MLAs ended up staging a protracted hunger strike.¹⁸ One year later in 1989, the TDP lost the State general elections and the project of drawing water from the Krishna was initially withdrawn. However, in subsequent years it was again harshly debated. The project was eventually started in 2003. Factors explaining the opposition to the project are related to the regional set-up of AP, as well as in the general context of confrontation so characteristic of political debates in the State. For historical reasons, AP is divided into three regions namely Telangana in the North, Rayalseema in the South and Coastal Andhra. The political discourse very often proceeds along regional fault lines, to the extent that a strong political party in the State, the Telangana Rashtra Samiti, has as its main political objective the creation of a separate Telangana State based on the present Telangana region.

The reallocation of water from the Krishna to Hyderabad has been invariably opposed by farmers and politicians from the drought-prone Rayalseema region on the basis of regional considerations. Notably, MLAs from Rayalseema have argued that before bringing water to Hyderabad which is located in Telangana, projects that had been previously sanctioned for diverting water from the Krishna River to Rayalseema, but never implemented, had to be taken up first. The political sensitivity of supplying Hyderabad from the Krishna stalled the decision-making process till 2003, when a major drought brought Hyderabad to the brink of a major water crisis and the Government of AP eventually took the decision to implement the Krishna Drinking Water Project. The first phase carrying around 409 thousand m³/day to Hyderabad was completed in 2005.

3.2. Urban water supply organisational set-up

The Hyderabad Metropolitan Water Supply and Sewerage Board (HMWSSB)¹⁹ established in 1989 is in charge of Hyderabad water supply and sanitation. The HMWSSB was constituted under the Hyderabad Metropolitan Water Supply and Sewerage Act by consolidating two existing public Departments, namely the Public Health Engineering Department formerly in charge of water supply, and the Municipal Corporation of Hyderabad (MCH) which was responsible for the sewerage services. Presently covering a service area extending over some 793 km², it is entrusted with the control of all infrastructures related to the city water supply and sewerage system. For the time being, the HMWSSB provides the bulk of treated drinking water to 7 Municipalities. The MCH maintains control over the distribution of water and over the sewerage system (when

¹⁸ 'R'seema MLAs Stage Walk-Out', *Deccan Chronicle*, July 28 1988 and 'MLAs' Fast Continues', *Deccan Chronicle*, 20 August 1988.

¹⁹ Hereafter "Water Board".

existing); and directly controls the distribution of treated drinking water in the 3 remaining Municipalities (Qutubullapur, L.B. Nagar, and Kukatpally), as well as in the Municipal Corporation area. In the near future the HMWSSB will take control over the water distribution system over the whole Hyderabad urban agglomeration.

The constitution of the HMWSSB, encouraged by the World Bank, was seen as a means of establishing a water and sewerage authority with great financial autonomy, as well as heightened accountability to the costumers.²⁰ Financial autonomy was notably perceived as a means to entrust the HMWSSB with great operational and decision-making control, thus insulating it from political interferences. In practice, it has never been able to achieve financial autonomy, largely because of extremely low rates of water fees collection. The HMWSSB eventually became highly dependent on – and controlled by – the Government of AP. This dependence on the political establishment is further accentuated by the fact that the Chief Minister of AP acts as the chairman of the Board of Directors of the HMWSSB.

The Irrigation Department is also having a strong influence on the supply of water to Hyderabad since it is in charge of the operation of the two major water sources of the city: Nagarjunasagar on the Krishna River, and Singur on the Manjira River. This set-up is at odds with the mandate of the HMWSSB, which should exert control over Hyderabad water supply infrastructure. The case of Singur is representative of the problems that such an institutional arrangement can engender. The dam is operated by the Irrigation Department, though it serves Hyderabad on a priority basis. Releases of water from Singur main gates for irrigation purposes have to be jointly agreed upon by the Principal Secretary for Irrigation and the Managing Director of the HMWSSB. Theoretically, their decision should be based on dam operation rules that were sanctioned by the Government of AP in 1990²¹, that account for the quantity of water available in the reservoir. In case of discordance of opinion between Principal Secretary and Managing Director, the matter is brought to the attention of the Chief Minister who eventually decides. The problem is that the operation rules, instead of providing for an objective tool for deciding over water sharing between agriculture and Hyderabad, proved to be ill-designed and inadequate for deciding over intersectoral water distribution.²² Therefore, whether or not to release water for crop production became a matter of political consideration. In an attempt to establish its authority over Singur, the HMWSSB has put forth some proposals to the Government of AP for being entrusted with the control of the dam, but these have been eventually turned down because of the stiff opposition of the Irrigation Department.

A comparable situation is represented by the transfer of water to Hyderabad from the Krishna, which is presently carried out by utilizing pre-existing structures that are under the control of the Irrigation Department, and notably the so-called Akkampally balancing reservoir. The HMWSSB is now trying to obtain Government approval and financial

²⁰ Jennifer Davis, The Hyderabad Metropolitan Water Supply and Sewerage Board (Massachusetts Institute of Technology, n.d.).

²¹ Andhra Pradesh Irrigation and CAD (Irrgn. V) Department, Government Order Ms No. 93, dated February 24, 1990

²² Mattia Celio and Mark Giordano, Agriculture-Cities Water Transfers: A Case Study of Hyderabad, South-India (Taiwan: International Water Management Institute (IWMI), Council of Agriculture, the Agricultural Engineering Research Center, Union Foundation Committee of T.I.A.F, 2006).

assistance for constructing an independent structure over which it would have total control.

3.3. Urban water conservation and reuse policies

Since the constitution of the HMWSSB in 1989, a number of reforms aimed at the conservation of urban water have been put forth. Using water pricing mechanisms has been one of these. Notably, water fees in the city have been increased in an effort to cover the operation and maintenance (O&M) costs of Hyderabad water supply; and promote water conservation at the end-user level. Water fees and connection charges were raised by 17 per cent in 1993, by another 25 per cent in 1997, and again by a sizable 64 per cent further increase in 2002.²³ It was reckoned that if all the water users in Hyderabad did pay their water bills, the present tariffs structure would cover the O&M costs of the urban water supply system. In reality, only around 50 per cent of metered users pay for the water they use, and most of those who receive water from the HMWSSB pay flat rates since they haven't yet installed a meter on their connection.

Tackling the water transmission and distribution losses as well as water tampering (Unaccounted For Water – UFW) is another policy adopted to conserve water. The UFW problem was dealt with in 1996 by setting-up a new Division within the HMWSSB in charge of conducting area-wise campaigns to identify and replace damaged pipes and consumer service lines.²⁴ Notwithstanding this, UFW is still a major concern of the HMWSSB, since present estimates indicated that it ranges between 40 to 55 per cent of the water withdrawn at source.²⁵

Another initiative of the Government of AP intended to conserve water as well as to cope with groundwater depletion has been the establishment in 1997 of a Rain Water Harvesting Cell within the HMWSSB main office.²⁶ This measure was actually a follow-up of an administrative order making mandatory the installation of rainwater harvesting structures in new layouts and multi-storied buildings of Hyderabad.

The last and certainly most ambitious plan of the HMWSSB and of the Government of AP is to reuse treated wastewater generated by Hyderabad for non-drinking purposes, including industrial processes, irrigation, or for recharging aquifers. According to the feasibility study commissioned by the Government of AP, there is a scope for reusing 700,000 m³ of water per day by 2031.²⁷ Nevertheless, certain aspects of the project will probably need revision, as for instance the proposed disposal of partially treated wastewater in the Musi River just upstream Osmansagar, as this is one of Hyderabad drinking water sources.

²³ See Davis, note 20 above.

²⁴ HMWSSB, 8th Annual Report. 1996-1997 (Hyderabad, India: 1997).

²⁵ See Davis, note 20 above.

²⁶ HMWSSB, 9th Annual Report. 1997-1998 (Hyderabad, India: 1998).

²⁷ PA Consulting Group, Water Reuse Preliminary Concept and Feasibility Study (Hyderabad (India): 2004).

4. WATER LAW

4.1. Rights over surface water in India

In India, a comprehensive national water law is still lacking. Water-related legal provisions are dispersed across various irrigation acts, central and state laws, constitutional provisions, court decisions, customary laws, and various penal and criminal procedure codes. The right to legislate over “Water, that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and water power (...)”²⁸ is given to the States by constitutional provision. This right can be curtailed in the event of interstate conflicts over watercourses crossing States boundaries that cannot be settled by negotiation. In this case, the Central Parliament can order the constitution of a tribunal for the adjudication of the water conflict under provision of article 262 of the Constitution. The power of the States over water is not only a constitutional matter, since it is also codified into the Easement Act (1882), and generally further reaffirmed in States irrigation and/or water Acts.²⁹

4.2. Water law reforms in Andhra Pradesh

Over the last decade, the Government of AP headed by the Chief Minister Chandrababu Naidu introduced a series of water law reforms. In 1997, the State passed the AP Farmers’ Management of Irrigation Systems Act that provided for the handing over of water management responsibilities in irrigation canal systems to associations of farmers. In the same year, the AP Water Resources Development Corporation Act was enacted sanctioning the setting-up of a corporation in charge of managing water resources in an integrated manner, notably through planning and coordinating water use by different sectors. Eventually, in 2002 was passed the AP Water, Land and Trees Act that tackle in particular issues of groundwater as well as surface water protection, and makes provision for the constitution of an authority in charge of performing a number of functions related to the provisions spelled out in the Act. In the following paragraphs some of the main features of the three Acts above are briefly outlined.

The State of Andhra Pradesh has been the first in India to introduce major reforms in the legal system regulating the management of water resources in irrigation schemes, notably through the promulgation of the Andhra Pradesh Farmers' Management of Irrigation Systems Act (APFMIS) in 1997. The reform was inspired by international examples in which allowing for the active participation of farmers in the management of irrigation systems sub-units had had a positive impact on the performance of the agricultural sector. Notably, the involvement of farmers had permitted to improve operation and maintenance of infrastructures, rate of collection of water fees, and allowed for an institutional mechanism for resolving water conflict. Success stories in introducing participatory irrigation management in countries like the Philippines, Turkey, and particularly Mexico have given the impetus for the introduction of similar management principles in other countries like India.

²⁸ Schedule 7, State List, Entry 17.

²⁹ Chhatrapati Singh, 'Water Rights in India', in Chhatrapati Singh ed., *Water Rights in India* 8 (New Delhi: Indian Law Institute, 1992).

In spite of massive financial investments in the sector, in the 1990s irrigated agriculture in AP was suffering critical issues including the steady decline of the irrigated areas, poor collection of water fees and maintenance of infrastructure, and agricultural productivity below the expectations. The 1997 APFMIS Act was meant to deal with these issues, through providing for the establishment of Water Users Associations entitled to plan the distribution of water among their members and regulate water use, collect water charges and raise resources, and resolve disputes within their jurisdiction. Though constituting a dramatic change in the way irrigation systems are managed, particularly since handing over to the water users tasks previously entrusted to the Irrigation Department, water users haven't acquired any additional rights over water as compared to those they used to enjoy prior to the implementation of the reform. The only difference is that whereas the State still keeps in its hands proprietary rights over canal water, usufruct rights are now vested in associations of water users having at their apex an elected body of users' representatives. Allocation of water is therefore decided within the WUA, according to user-based rules and water distribution mechanisms agreed upon by the elected representatives. Though actual impact of the reform is still being assessed, studies gathered by Hooja et al.³⁰ tend to show that the outcomes of the reform might be below expectations. In any case, it is certain that more time and empirical research is needed to get a clearer picture of the impact of the implementation of the APFMIS Act.

The enactment of the AP Water Resources Development Corporation Act (APWRDC) is particularly interesting in a multisectoral perspective since the Act deals with the broad spectrum of water uses, such as the “promotion and operation of irrigation projects, command area development and schemes for drinking water and industrial water supply to harness the water of rivers of the state of Andhra Pradesh and for matters connected therewith or incidental thereto including flood control”.³¹ The setting-up of such an organisation for managing water resources in an integrated manner fits well in the river basin development model presented in the theoretical section of this article. When the resource becomes scarce and intersectoral tensions develop, institutions overseeing the water use in large water units such as river basins are generally created. Nevertheless, the Water Development Corporation constituted in AP is not explicitly entrusted with the function and powers to plan intersectoral water allocation in an integrated manner, but only to look at each of the sectors separately. Though there is little written evidence allowing for the evaluation of the works of the Corporation and of the effectiveness of the APWRDC Act, Gulati et al.³² suggest that “the legislation has not been as strong in including transparency and accountability in its performance; nor in providing incentives and disincentives to staff and water users (in all sectors) to enhance water use efficiency. The Act is not clear about water rights. Furthermore, the Act emphasizes controlling extraction only of surface water, and groundwater is untouched”.

The last reform in water law in AP promoted by the Telugu Desam Government has been the enactment of the AP Water, Land and Trees Act (APWLTA) in 2002. The Act put a strong focus on water conservation, as well as on protection of surface and groundwater

³⁰ Rakesh Hooja et al. eds, *Users in Water Management* (Jaipur & New Delhi: Rawat Publications, 2002).

³¹ Andhra Pradesh Water Resources Development Corporation Act, 1997.

³² Ashok Gulati et al. eds, *Institutional Reforms in Indian Irrigation* (New Delhi: Sage Publications, 2005).

from pollution. Moreover, it makes provision for the constitution of a Water, Land and Trees Authority for promoting water conservation, regulating surface- and groundwater exploitation in the State, and advising the Government of AP on matters related to the Act. The APWALTA only marginally accounts for the regulation of intersectoral water use, notably when it gives priority to drinking water through banning the sinking of tubewells within a pre-established distance from groundwater drinking water sources.³³

5. DISCUSSION AND CONCLUSIONS: THE NEED FOR INSTITUTIONS AND POLICIES ACCOUNTING FOR INTERSECTORAL WATER REALLOCATION

A number of shortcomings in reallocating water from the agricultural sector to Hyderabad have been highlighted in this article. The main shortcoming is certainly the sluggishness in the decision-making process for augmenting Hyderabad's water supply, which is at odds with the vibrant growth of the city and its need for water. To give an example, water from the Krishna River reached Hyderabad only in 2005, that is 32 years after the submission of the report of the Sreenivasarao Expert Committee recommending the transfer of water from the Krishna to secure the city's water supply. Partially because of the non-implementation of the recommendations put forth by the Sreenivasarao Committee, which were then further reasserted in the report of a second expert committee constituted in 1986, the per capita urban water supply dropped to some 71 litres per day in 2001, and Hyderabad went close to a water collapse in 2003 when the Singur reservoir, the city's main source at that time, almost dried up because of consecutive droughts.³⁴

The main reason explaining the protracted decision-making process is the politicisation of the process of augmenting Hyderabad water supply. Water reallocation from the Krishna River has been harshly opposed by some legislators since entailing the transfer of water between two regions, and notably from Rayalseema in the south to Telangana in the north. Regional considerations are still determinant today in the ongoing debate over implementing or not the already planned third phase of the Krishna Drinking Water Project. Notably, the present Government is considering drawing water from the Godavari River instead. But regionalism is not the only factor explaining the chronic delays in increasing the city's water endowment. Supplying Hyderabad brings about lower electoral payoffs when compared to providing farmers with water, and this has certainly restrained the standing Governments from sanctioning major water reallocations out of the agricultural sector. This attitude can be better understood in one considers that the politics in AP are not dominated by only one monolithic party, but by the Indian National Congress and the Telugu Desam which are in constant competition and need thereby to finely gauge their choices in terms of number of votes that particular projects are likely to generate.

This politicisation of Hyderabad water supply is the main result of the overarching power vested in the Government for matters related to surface water resources, which is secured by Indian Constitutional and legal provisions but as well reaffirmed in water-related Acts

³³ Chapter 3, Section 10(1), Andhra Pradesh Water, Land and Trees Act, 2002.

³⁴ 'Hmwssb for Recycling of Sewerage Water', *The Hindu*, 9 March 2003 and '400 Tankers to Supply Drinking Water in City', *The Hindu*, 20 April 2003.

recently passed in AP. Eventually, through keeping tight decision-making powers, the Government of AP indirectly subjects water related issues to constant questionings and resistance from parties in the opposition. This situation goes against the tide of water institutional reforms recently promoted by the Union Government, and notably the effort to decentralize water management tasks. This tendency is notably illustrated by the adoption of the 73^d and 74th Amendments of the Constitution providing for increased control of Gram Panchayats (the local government bodies at the village level in India) over water use.

A significant exception to the centralisation of water development and management experienced in AP is the devolution of water management responsibilities to farmers located along the distributaries of irrigation projects, legally sanctioned via the 1997 APFMIS Act. The WUAs constituted under the Act all across the State might have represented key counterparts for the Government of AP when transferring water from irrigation projects to Hyderabad, particularly in regard to negotiating compensation measures and/or marketing water. Hearne et al.³⁵ stress the important role that WUAs have played in the marketing of water in the Elqui valley in Chile. Nevertheless, since the 1997 APFMISA Act does not entitle farmers to sell surface water, marketing is still not an option for transferring water from irrigated agriculture to cities in AP. Moreover, an efficient water market would require a well functioning irrigation system, where the quantities of water distributed to the different sections of the project can be accurately determined beforehand, which is far from being the case in most of the Indian irrigation projects. This deficiency is also likely to undermine all efforts to determine the appropriate level of compensation that farmers might receive when water is reallocated to other sectors.

The constitution of a Water Resources Development Corporation³⁶ in 1997 might have provided the opportunity to delegate some of the Government responsibilities and thereby try to reduce the political pressure on water resources and on intersectoral reallocations. On the contrary, the Act strengthens the role of the State, since the members of the Corporation either belong to – or are elected by – the Government of AP. In this regard, it is interesting to report the case of water law reforms in the neighbouring State of Maharashtra. In 2005 Maharashtra passed the Water Resources Regulatory Authority Act that provides for the constitution of a Water Regulatory Authority (hereafter “Authority”). Unlike in the case of AP, the membership structure of the Authority excludes political leaders, so as to reduce political interferences and Government influences.³⁷ Moreover, among the powers, functions, and duties of the Authority there is the clear specification that it has to “determine the distribution of entitlements for various categories of use”³⁸ including domestic, agricultural irrigation, industrial and commercial. The possibility of marketing surface water resources is among the others innovations

³⁵ Robert R Hearne and William Easter, Water Allocation and Water Markets. An Analysis of Gains-from-Trade in Chile (Washington, DC: World Bank, 1995).

³⁶ Andhra Pradesh Water Resources Development Corporation Act, 1997.

³⁷ For an exposure on water law reforms in Andhra Pradesh and Maharashtra, see Philippe Cullet, 'Water Law Reforms. Analysis of Recent Developments', 48 *Journal of the Indian Law Institute* 206 (2006).

³⁸ Chapter 3, Section 11(a), Maharashtra Water Resources Regulatory Authority Act, 2005.

introduced in Maharashtra, which might allow farmers to get appropriate compensations for water reallocations.

The State water policy that is being drafted in AP might provide for guidelines accounting for intersectoral water reallocations, similar to the state water policies recently issued in Karnataka and Maharashtra. In the National Water Policy (NWP) issued in 2002 there is a clear concern for planning and setting-up institutional mechanisms capable of dealing with multisectoral water uses, since “Water resources development and management will have to be planned (...) multi-sectorally (...)”.³⁹ Nevertheless, there is no indication as to how this should actually happen. Prioritizing drinking water over other uses, as has been done in the NWP (though priority “could be modified (...)”⁴⁰), is of no help in large agriculture-city water reallocations, since water conveyed to urban centres is used for a multitude of uses extending well beyond drinking water. Furthermore, transferring water out of irrigation projects doesn’t mean that only agriculture will be affected, since in many cases irrigation canals also feed surface reservoirs that are utilized for drinking purposes. In addition, irrigation canals are also generally unlined and therefore constitute points of recharge for groundwater that is often subsequently withdrawn for drinking purposes. This linkage between water uses at the river basin level, named “cascading reuse systems” by Molden et al.⁴¹, significantly reduces the scope of prioritizing water uses as a means of providing guidance for reallocating water among sectors.

Reallocating water between agriculture and cities in water-scarce environments is becoming a major issue, and though new institutions are most needed for dealing with it, what form these institutions should have and when and how they should be put in place is still a debated question. The Hyderabad case clearly shows that administrative allocation is inappropriate for dealing with water reallocations, at least when powers over water are so overwhelmingly vested within Governments and user participation in the decision-making process or implementation phase is barred. The water law reforms introduced in Andhra Pradesh have only accentuated the problem, and new mechanisms for reallocating water between sectors need to be considered. One possible option is to examine the strengths and shortcomings of reforms in other Indian states, in particular those recently initiated in Maharashtra.

³⁹ Section 3(3), National Water Policy, 2002

⁴⁰ Section 5, National Water Policy, 2002

⁴¹ David J. Molden and M. G. Bos, 'Improving Basin Water Use in Linked Agricultural, Ecological, and Urban Systems', 51 *Water Science and Technology* 147 (2005).