

## **Executive Summary of Vyas Committee Report on Integrated Water Resources Development in Rajasthan**

### **Water in Rajasthan: Need for Action**

- 0.01 ***Dire Situation:*** Rajasthan is possibly the driest state in India. Although it has one-tenth of the land area of the country, over 5 per cent of its population and nearly a fifth of its livestock, its share of India's surface and ground-water resources is under 2 per cent each. The situation has worsened over time. The state population growth rate is among the highest in the country. Demand for water from uses such as industry, tourism and sanitation and environmental purposes has grown apace, while the supply has remained unchanged. The primary source is scanty and uncertain rainfall confined to two months of the year. Availability of water from all sources has come down to under 800 cum per person per year and will soon reach a highly precarious level. Nearly two-thirds of the state is arid or semi-arid. A disproportionate reliance on groundwater adds to the problems of water availability, especially in drought years. Similarly, heavy reliance on 'imported' water from neighbouring states adds to the uncertainty. Inefficiency in the storage, conveyance and use of water results in further worsening of an already difficult situation. Iniquitous access to water by different user groups, economic strata, and regions, as well as a steady deterioration of water quality compound this poor situation. Thus, the water situation of the state is quantitatively and qualitatively precarious and the state is faced with formidable, almost insurmountable, handicaps.
- 0.02 ***Mitigating Circumstances:*** This reality is tempered by some mitigating circumstances and redeeming factors, which need to be fully exploited to resolve the problems. They include a growing consensus about the gravity of the situation and need for bold action; some innovative and successful efforts, which have the potential for scaling up; and an improved understanding of policies and programmes and their efficacy to solve problems.
- 0.03 ***Committee and Mandate:*** Concerned with this situation, the Government of Rajasthan formed an expert committee under the Chairmanship of Professor V S Vyas to deliberate and recommend integrated development of water resources of the state in June 2004. It was to suggest changes in the state water policy and recommend measures for integrated and sustainable development of all its water resources, as well as improving water use

efficiency, especially in agriculture. This Report of the Committee suggests a framework, which includes proper understanding of different problems as well as directions for resolving these problems.

### **Goals, Mission, Strategies**

- 0.04 ***Water Security for All:*** Water must be seen in an integrated and holistic manner, with a clear understanding of the mission, objectives and areas of strategic intervention. The state must accept access to water for survival as a basic human right. The goal of water security for all and forever implies efficiency, equity, and sustainability as the guiding principles of water resources management. . The chief objective of the state water policy would be socially optimum development and sustainable utilisation of the state's water resources. The mission would be **"to ensure efficient, equitable and sustainable supply of water to the citizens of the state within a given time frame."**
- 0.05 ***Integrated Water Resources Management:*** In view of the finite availability of and growing demand for water, the state water policy should advocate an integrated approach and prioritise various activities. All sources of water, surface and ground, must be reckoned together, as should its uses, for drinking, irrigation, industrial and other purposes, rather than treating each fragment as an entity of its own. The solutions would go beyond engineering or technology, necessitating a multi-disciplinary approach. Participation of the concerned population in planning and managing the use of water, due recognition of the crucial role of women and its incorporation in all decision spaces, and an explicit recognition of water as an economic and social good are all components of integrated water resources management.
- 0.06 ***Basins as Unit of Planning:*** This suggests planning of water resources based on dependable information at the river basin (or canal or aquifer) level, co-ordinated at the state level. The basin plans in turn could be sub-divided into watershed development plans. This involves realistic water budgets for the basin, transfers of water from surplus to deficit basins keeping in mind the environmental impact of such transfers, and establishment of basin management organisations. In these areas, bodies such as duly empowered Water Users' Associations would be required to ensure people's effective participation.
- 0.07 ***Elements of Strategic Interventions:*** Besides the above, conjunctive use of surface and ground water, requiring careful regulation of extraction and monitoring of both these sources and their integrated utilisation, facilitated through appropriate and rational pricing of water will be crucial strategic interventions. Clear delineation of the roles of various stakeholders – households, government, NGOs, panchayati raj institutions, private bodies -, establishment of water rights and an enabling legal framework are adjuncts of the interventions. Supportive measures include building up the capacities of users' organisations enabling them to discharge their legitimate and warranted functions effectively, and state-wide data base, with appropriate monitoring and updating mechanisms.

## **Augmentation of Water Supply**

- 0.08 ***Supply Deficits and Bottlenecks:*** The available supply is short of the state's requirements by some 8 BCM at present, which will go up to 9 BCM by 2015. Natural monsoon precipitation averages 590 mm in the state, but varies widely from region to region and year to year. The bulk of it is lost due to run-offs or evaporation. There are no perennial rivers. A large part of state's water supply is through inter-state flow of water, which adds a political dimension to the problem. As the experience all over the country suggests, riparian states try to pre-empt the water to meet with their own growing needs. Excessive dependence on progressively dwindling ground water resources with continuously rising cost of extraction is another serious difficulty.
- 0.09 ***Conservation as Means of Augmenting Supply:*** Since the availability cannot be increased, measures such as rain water harvesting, expeditious completion of projects under implementation, harnessing untapped potential and full utilisation of potential already created, re-charging ground water in a campaign mode, reducing evaporation losses, recycling the used water and, above all, saving of water by more efficient ways of conveyance and application all become important means of conserving supplies.
- 0.10 ***Special Attention to Ground Water Resources:*** Rajasthan is overwhelmingly dependence on ground water. Nearly 90 per cent of the drinking water and 60 per cent of the irrigation water is extracted from ground water reservoirs. Over a period of time this situation has become precarious. Only 32 blocks in the state can be considered "safe". Overall exploitation of ground water at 11.6 BCM now exceeds overall recharge of 11.1 BCM Intensive efforts for recharging ground water are called for. Artificial recharge may be possible in several areas, which must be attempted forthwith. The quality of ground water has progressively deteriorated as wells are dug deeper and deeper. Techniques such as reverse osmosis, electro-dialysis, flash distillation, etc have been used in other states to improve water quality. Their utility to specific areas of Rajasthan needs to be explored. They should be used wherever they are cost-effective. The application of these technologies must be accompanied by proper education and sensitization of the users to their importance.
- 0.11 ***Rights and Obligations:*** The communities' usufruct rights for a given aquifer must be recognised, and accompanied by dependable information on the availability of ground water resources in the given aquifer. The community should be sensitised to share this water responsibility. Those who extract ground water should also be obliged to recharge it. Supportive regulation to control extraction of ground water, especially in the "dark" and potentially dark zones is required.
- 0.12 ***Supporting Measures:*** All these tasks require a massive campaign to educate the people regarding the severity of the crisis and criticality of suggested actions. The campaign must make effective use of all mass media and involve NGOs, which are better equipped to create mass awareness and mobilise people for such actions.

## Domestic Use of Water

- 0.13 ***Increasing Demand, Dwindling Supply:*** The problem of drinking water in Rajasthan is particularly acute. The current demand of about 2.5 BCM for this purpose is likely to double in the next 40 years. Another 2.0 BCM will be needed in that year for cattle for drinking purposes as well. Rapid population growth, rising demand, neglect of old traditional sources, silting of reservoirs, change in land use, etc have shrunk the availability of water resources during the last few decades. Consequently, ground water resources have been over-exploited and their quality has also deteriorated. All these factors have affected sustainability of sources for drinking water supply.
- 0.14 ***Remedies for Supply:*** A review exercise for each drinking water supply scheme to estimate demand of water for drinking and other civic uses for the next 10 to 20 years is needed to ensure its sustainability. Availability of water from different sources should be assessed as a part of the exercise. Planning for drinking water supply should ensure meeting the demand with 90 per cent reliability. Additional sources should be created well before the availability is likely to drop below the sustainability. In case of groundwater sources, maintaining a carry-over storage of water equivalent to the demand for one year (excluding evaporation and percolation losses) would be desirable. Such schemes should also include recharge by an amount equivalent to annual withdrawal. Artificial recharging should be resorted to if found feasible.
- 0.15 ***Poor Quality and its Rectification:*** The quality of ground water in the state, as indicated by the presence of various impurities and sediments, is among the poorest in the country. A number of schemes have been taken up, or are being planned to supply safe water to problematic villages/habitations. The proportion of such benefited villages, however, is quite small. This requires immediate correction.
- 0.16 ***Equity Considerations:*** The norms for urban water supply need to be revised downwards to ensure that there is some parity between urban and rural availabilities and the supply is stretched to meet the requirements. Indiscriminate sinking of wells for domestic water supply leads to drying up of these wells and falling water tables. This needs to be checked.
- 0.17 ***Costing, Economics and People's Participation:*** The cost of supplying drinking water is rapidly increasing, as local sources are either not available or not adequate, causing water to be conveyed over long distances. The government cannot bear all this cost. Community participation could result in significant saving in operation and maintenance costs. While the government could bear capital costs, users should bear the operating costs. Poorer sections, however, should be provided targeted subsidies to ensure that paucity of means does not imply denial of access to water. Public-private partnerships, especially in cities, could similarly reduce costs and increase revenue realisations. Distribution losses, non-revenue supplies, low recovery of operational costs, replacement of over aged and malfunctioning equipment, adequate funds for maintenance are some of the other issues that need to be addressed urgently to ensure that the available water is used efficiently and effectively. As with other areas of water management, participation of an informed citizenry and NGOs in these tasks would greatly improve the situation.

## Irrigation Management and Reforms

- 0.18 ***Major but Inefficient User Segment and Tasks Ahead*** : Irrigation claims the lion's share, over 80 per cent, of the available water supply in Rajasthan, as it does elsewhere in the country. It is also among the worst offenders in terms of losses and inefficiency. Inadequate use of created potential, poor condition of irrigation head works, canals, distribution structures, poor conveyance efficiency, absence of people's participation, irrational water rates, inadequate support from agriculture department for optimum water use, etc are among the factors leading to such a situation. The tasks are two-fold: rectifying the current situation and managing the resource judiciously in the future to ensure its optimal use. A mix of policy, technological, agronomic, and economic measures is required.
- 0.19 ***Policy and Technology Issues***: The existing poor efficiency of canal irrigation needs to be improved by emphasising maintenance. Completion of projects underway, using available potential (as in southern humid basins), improving storage, etc will improve the availability of water. Legal framework needs to be modified to ensure people's participation, compliance with drainage and conjunctive use measures. Extensive, as against intensive, irrigation needs to be given preference. Adoption of pressure and drip irrigation, encouragement of deficit irrigation, recourse to lift irrigation, would all serve the purpose of economising water use. Some small, gated structures upstream may be permitted to meet the needs of local inhabitants, with a sharing formula that reserves the entire monsoon flow for the big system and the post monsoon flow for the small structures. Structures downstream help harvest the overflow and the seepage of big systems as also the return flow of the canals. Proper agronomic practices as well as selection of crops that use less water will again help improve irrigation water use for crop production.
- 0.20 ***Irrigation Management and People's Participation***: Formation of Water Users' Associations and their involvement in various operational and management tasks is essential for improving the water use efficiency and effecting savings of water and expenses. Such organisations could be educated in the conjunctive use of ground and surface water to help improve water use pattern as well as avoid salinity. Their capacities need to be built up, primarily through NGOs. PRIs also have a legitimate role to play. Sectoral and project studies help identify the environmental impact of projects should be mandatory for major and medium projects. These would help design environment-friendly projects in future.
- 0.21 ***Economic Issues***: Water allocation priorities are drinking water, irrigation, power generation, industry, tourism and other uses in that order. Allocations for the water sector must at least be protected if not increased in view of the dire situation. The available funds must be judiciously allocated, first to maintenance and restoration of existing assets, next to completion of on-going projects and finally to new projects. The present low irrigation rates in the state do not reflect the scarcity value of water, nor the cost of providing it. The guiding principle could be to recover at least the full O&M costs. Incentives to those who apply the recommended measures as well as penalties or disincentives for those who willfully neglect such recommendations are desirable. Implementation of the various reforms and changes in irrigation management, especially those associated with water rates, will require strong political will and great courage.

## **Administrative and Legal Aspects**

- 0.22 **Persistent Problems:** Administration of the water sector in Rajasthan, as in other states of the country, suffers from many defects. These include widening of the government role and consequent shrinking of the role of the community; attendant bureaucratisation, marked by a hierarchical, top-down, and fragmentary approach; profusion of departments and agencies with limited co-ordination among them; simultaneous pursuit of development, management and regulation, with emphasis on development and neglect of maintenance, which affects efficiency and reduces accountability. The administration is not people friendly, its approach fragmentary and its competence lop-sided.
- 0.23 **Recommended Structures:** The situation needs to be rectified at all levels and along many dimensions. At the ground level, WUAs need to be strengthened and enabled to take on increasing roles in the planning and operation of specific projects in their areas. This must form the foundation of the administrative structure. They must receive adequate technical and managerial support to be truly effective. Basin level committees should be formed and given adequate technical and financial resources to manage their areas. These would help fill the gap between the ground level and the state. A state-level water resources development organisation with multi-disciplinary staff should be set up. This department will take on the tasks which are presently distributed among many different ones with diverse interests and thus help achieve integration. Placing the policy and planning function in a new, separate and highly professional department is essential for the state to manage this scarce and valuable resource in the broader public interest rather than being dominated by narrow sectoral interests as at present. Implementing departments and agencies should concentrate on cost-effective and efficient service delivery in their respective sub-sectors and ensure proper functioning and productivity of the state's massive investment in the water resources infrastructure created over the years. This department should be directly under the Chief Minister and headed by a very senior administrator. A high-level State Water Council to oversee the whole sector from a wider perspective, ensuring efficiency and equity should be formed. It should have a limited but functional co-ordination and not merely be a decorative appendage. A separate regulatory organisation is also needed to give due attention to this important task. Such a body whose credentials are above board should initiate the move towards more rational water rates.
- 0.24 **Legal Aspects:** The State Water Policy would be enforceable only if it is backed by a comprehensive water legislation. A law relating to management and rational use of surface water, ground water and share in interstate river waters is long overdue. The first task is to filter and clean the large number of laws on this subject. Some existing laws or their provisions that have outlived their utility must be repealed or amended. Ownership of water should not vest in the government but it should be the property of the people. The riverine community as well as those who have land above ground water sources may have *usufruct* rights subject to overall needs of the community. Enforceable rules for regulating ground water supply, combining positive and negative economic and administrative measures need to be in place. A comprehensive Water Law will be the **final**, culminating reform.

## Civil Society Organisations

- 0.25 ***Policies for NGOs:*** Since public participation is essential in the critical water resource development activities, NGOs, which are close to people could play a pivotal role in mobilising and organising them as well as enhancing their capacity for undertaking the various tasks. NGOs are much better equipped to create the above pre-conditions than the government. The NGO policy framework is based on certain lessons drawn from Rajasthan and elsewhere. Water sector programmes must generate a sense of ownership among the users and allow freedom to innovate. Collaboration among government, NGOs and user groups should be institutionalised in with specific and streamlined roles and responsibilities of each partner.
- 0.26 ***Scope for NGO Participation:*** NGOs could be effective in awareness building in communities, capacity building of WUAs, design and construction of water harvesting and conservation structures, design, execution and management of minor irrigation projects, sharing experiences and information with various stakeholders, and integration of information from various sources. NGOs should be fully involved to the extent required in such activities. More experienced NGOs should also find representation in planning forums at the state and the district level.
- 0.27 ***Modalities for NGO Participation:*** Certain procedures should be followed to encourage involvement of the right kind of NGOs. These procedures cover their registration and empanelment, their assessment, approval of their projects, sanction and release of funds and their monitoring. Detailed provisions and formats have been evolved for these purposes.
- 0.28 ***Expeditious Process and Transparency:*** All these recommendations concerning registration of NGOs, identification, screening of projects, technical approval, various sanctions, fund release, etc must be time-bound and transparent without compromising the quality of the projects and works. The intention is not to create one more category of civil contractors or to curb any existing good treatment offered to the reputed NGOs in entrusting the works. The main purpose is to facilitate people's participation in this extremely important task by institutions that are closer to people and are capable of empowering them.

### **Ensuring Participation of Stakeholders; Clarifying their Rights and Obligations**

- 0.29 ***Avoiding Dependency:*** The commanding position of the bureaucracy has in managing water resources leads to a dependency syndrome among water users. The reason for several ills in this area is the alienation of users from the process of planning and distribution of water resources. Farmer participation has led to improvement in water use efficiency in several states.
- 0.30 ***Improving People's Participation:*** WUAs positively impact irrigation to the tail-ender, area under irrigation and revenues. They provide effective participatory management and need strengthening. Similarly, the involvement of the constitutional PRIs in water budgeting and auditing helps improve people's participation. Inventorising the needs and availability of water at the panchayat level and collating them at the basin

level, and again at the apex level will impart strength to local level institutions.

- 0.31 **Obligations:** Obligations of water users are difficult to define, especially in view of depleting ground water resources. It may be necessary to put a moratorium on digging wells not just in the dark zones, but even in other areas where paucity of ground water is imminent. It is necessary to put in an obligation of recharge on well owners. Restrictive regulations, such as prohibition on digging wells in command area of canals, may be withdrawn.

### **Cost Recovery and Privatisation**

- 0.32 **Basis for Rationalisation:** Beneficiaries pay an inadequate amount, whatever may be the concept and components of cost irrigation. Drinking water should be considered a 'natural' good and a minimum supply of drinking water should be available to every citizen as a matter of right. The state should reimburse the public authority responsible for supplying drinking water to truly indigent sections. Rationalisation of irrigation dues between crops and between regions and the charges levied on drinking water with different quantum of availability need priority attention. Such rationalisation will lead to better compliance. The idea of cost recovery will not float without addressing the issues of efficiency and accountability of service providers.
- 0.33 **Privatisation:** Private investment in surface water projects has not evoked much interest. Unresolved public policy issues in the environment and social spheres impinge on large-scale private investment in the development of water resources. Private markets, particularly in irrigation, are justified, as it is a commercial, profit-oriented, activity. Water could be considered as an economic good in that context. Water markets are, however, not easy to establish nor a panacea for all water-related problems. Pre-conditions for their successful functioning resemble those for all contractual transactions.

### **Water Literacy and Awareness Generation**

- 0.34 **Changing Perspectives:** The success of reforms in the water sectors hinges on public. There is a need to inculcate more balanced view that water is a scarce resource with multiple uses, multiple claimants and is inequitably distributed over time and space. There is also a tendency to view water related problems in a short-term perspective. These perspectives could be corrected by opinion leaders in different walks of life, whose help should be sought while introducing reforms. This is especially useful, since the effect of price on controlling consumption will not be significant if the share of expenditure on water is relatively small in the consumer's budget.
- 0.35 **Water Education:** This is needed at all levels. A concerted effort to educate students in their youth will have a lasting effect in terms of appreciation of water



situation. The population at large should be sensitised to the critical nature of the water situation. to the goals of efficient, equitable and sustainable water sector. This could be possible by creating awareness about the benefits from reforms, and the price that is being extracted by present systems and arrangements, together with progressively enlarging the constituency of those who will benefit from the reforms.