

Strategic Plan – 2010- 2022

Department of Drinking Water and Sanitation – Rural Drinking Water

Department of Drinking Water and Sanitation
Ministry of Rural Development
Government of India

Introduction

This document sets out a strategic plan for the Department of Drinking Water and Sanitation in the rural drinking water sector for the period 2010 to 2022.

- Part One sets out the *Aspirations and Goals* for the Strategic Plan of the Department of Drinking Water and Sanitation and the rural drinking water sector as a whole.
- Part Two outlines the rising aspirations, current situation, and challenges concerning the rural drinking water sector.
- Part Three sets out the *Strategy*. The Department of Drinking Water and Sanitation has identified four *Strategic Objectives* (Enable Drinking Water Security; Water Quality Management; Strengthen Decentralised Governance, and Build Professional Capacity) to achieve its overall objective of providing improved, sustainable water services in rural communities.
- Part Four provides options from which each State can formulate its own *Implementation Plan* depending on its needs, capacity and resources, and establish a timeframe for achieving transformation.
- Part Five outlines the necessary *Learning Agenda, Resources Required* and *Key Performance Indicators* to monitor progress against the Strategy and Implementation Plans.

The Government of India, through the Department of Drinking Water and Sanitation, has already taken significant steps to meet this challenge through the National Rural Drinking Water Programme (NRDWP).

This document has been prepared to help operationalise the NRDWP by setting out a Strategic Plan in terms of aspirations, goals, objectives and strategic initiatives for the sector for the period 2010-2022.

A Strategic Plan for Rural Drinking Water in India

Part One: Aspirations and Goals

Aspirations

All rural households have access to piped water supply in adequate quantity with a metered tap connection providing safe drinking water, throughout the year, that meets prevalent national drinking water standards, leading to healthy and well nourished children and adults and improved livelihoods and education. Continuous uninterrupted water supply is an aspiration and efforts should be made to cover increasing numbers of habitations with 24x7 water supply.

Goals

To ensure that every rural person has enough safe water for drinking, cooking and other domestic needs as well as livestock throughout the year including during natural disasters.

By 2022, every rural person in the country will have access to 70 lpcd within their household premises or at a horizontal or vertical distance of not more than 50 meters from their household without barriers of social or financial discrimination. Individual States can adopt higher quantity norms, such as 100 lpcd.

It is recognized that States will adopt their own strategies and phased timeframes to achieve this goal. Three standards of service can be identified depending on what communities want:

- Basic piped water supply with a mix of household connections, public taps and handpumps (designed for 55 lpcd) -with appropriate costing as decided by States taking affordability and social equity into consideration
- Piped water supply with all metered, household connections (designed for 70 lpcd or more) - with appropriate cost ceilings as decided by States taking affordability and social equity into consideration.
- In extreme cases, handpumps (designed for 40 lpcd), protected open wells, protected ponds, etc., supplemented by other local sources – preferably free of cost.

Optimum use of rainwater should be an integrated element in all the three cases.

Timelines

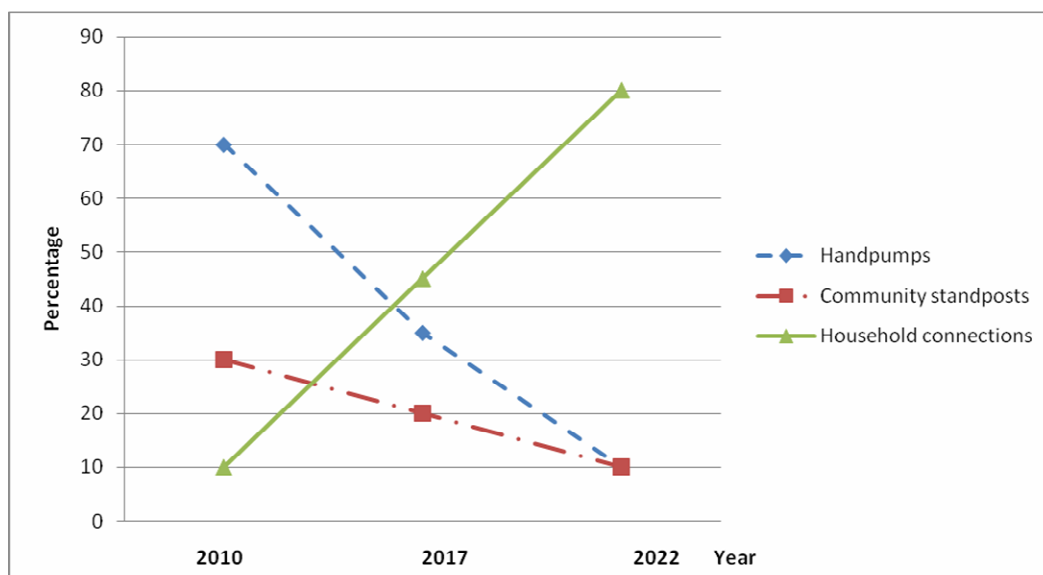
By 2017,

- Ensure that at least 55% of rural households are provided with piped water supply; at least 35% of rural households have piped water supply with a household connection; less than 20% use public taps and less than 45% use handpumps or other safe and adequate private water sources. All services meet set standards in terms of quality and number of hours of supply every day.
- Ensure that all households, schools and anganwadis in rural India have access to and use adequate quantity of safe drinking water.

- Provide enabling support and environment for Panchayat Raj Institutions and local communities to manage at least 60% of rural drinking water sources and systems.

By 2022,

- Ensure that at least 90% of rural households are provided with piped water supply; at least 80% of rural households have piped water supply with a household connection; less than 10% use public taps and less than 10% use handpumps or other safe and adequate private water sources.
- Provide enabling support and environment for all Panchayat Raj Institutions and local communities to manage 100% of rural drinking water sources and systems.



Part Two: The current situation, and challenges facing the sector

By 2022, India will have moved to middle income country status with the third largest economy in the world behind only the USA and China. Though economic growth is expanding access to resources and opportunities for increasing numbers of educated people coming from rural, small town and urban backgrounds it is evident that many areas of the country and many sections of the population are unable to access the opportunities available. The challenge is to sustain and broaden the scope of the growth process, to overcome the many inequalities that exist in urban slums and lagging rural areas, for SC/ST, poor and marginalized households and habitations, and to ensure that more people have better jobs, and better access to basic infrastructure and improved public services, like health, education, water supply and sanitation.

Since the First Five Year Plan (1951-1956), Government of India (GoI) and State governments have spent about Rs. 1,10,000 crore on rural drinking water. Under the

current Eleventh Five Year Plan (2007-2012), the total expenditure is likely to exceed Rs. 1,00,000 crore, and it is certain that investment in rural water supply will increase even more. Yet despite these huge investments, the sector is beset with problems. Ground water sources are deteriorating, many areas are classified as water quality affected, and poor operation and maintenance has resulted in dilapidated facilities. The causes behind this situation are to do with competing demands on scarce water resources, weak institutional governance, insufficient support structures and professional capacity at all levels. These need urgent attention. Looking to the future, there will be rising demand for higher quality of services to match those found in urban centres, intense competition for water from agriculture and industry, and increasing scarcity and variability of water resources due to population growth and climate change. Above all, Indian citizens, across a broad base of economic and social circumstances, are demanding transparency in "how decisions are made, how money is spent and to what end, and who the beneficiaries are"¹.

The Government of India, through the Department of Drinking Water and Sanitation, has already taken significant steps to meet this challenge through the National Rural Drinking Water Programme (NRDWP) launched in April 2009. NRDWP provides grants for construction of rural water supply schemes with special focus on water-stressed and water quality affected areas, rainwater harvesting and groundwater recharge measures, and for operation and maintenance including minor repairs. It promotes conjunctive use of surface, groundwater and roof water rainwater harvesting and actively supports convergence with other development programmes such as the MNREGS and Watershed Development Programmes. Support activities include setting up of State Water and Sanitation Missions and Water and Sanitation Support Organisations at State level, District Water and Sanitation Missions, Block Resource Centres and Village Water and Sanitation Committees, provision of District and Sub-divisional water quality testing laboratories, on-line MIS, and community involvement in water quality monitoring.

The current situation :

The current situation: There is no question that India has been successful in providing access to basic water supply facilities for nearly everyone; the challenge now is how to provide higher levels of service with sustainable sources and systems that provide good quality water to a growing population. Under the Accelerated Rural Water Supply Programme (ARWSP) India made good progress in terms of coverage. The Uncovered habitations as of 1st April, 2005, were 55,067 (4,588 Not Covered, and 50,479 Partially Covered)² the balance as of 1st April, 2009 was only 627 uncovered habitations. However, out of the total number of 16,59,741 habitations in India, the States reported

¹ Nandan Nilekani, writing on the advantages of information and communications technology in *Imagining India, Ideas for the New Century*, 2008

² 'Covered' means that at least one public investment has been made to create drinking water sources and / or systems. In addition, under ARWSP, Government of India norms were 'fully covered' meaning 40 liters per capita per day (lpcd), 'partially covered' meaning more than 10 lpcd but less than 40 lpcd, and 'not covered' meaning less than 10 lpcd. In addition, a potable water source should be within 1600m in the plains and 100 meters elevation in hilly areas of any household. This is the basis on which slippage was identified.

that 5,10,916 habitations (30%) had slipped back to partial coverage and 1,79,999 (11%) habitations were water quality affected as on 1st April, 2009. The reasons for this include:

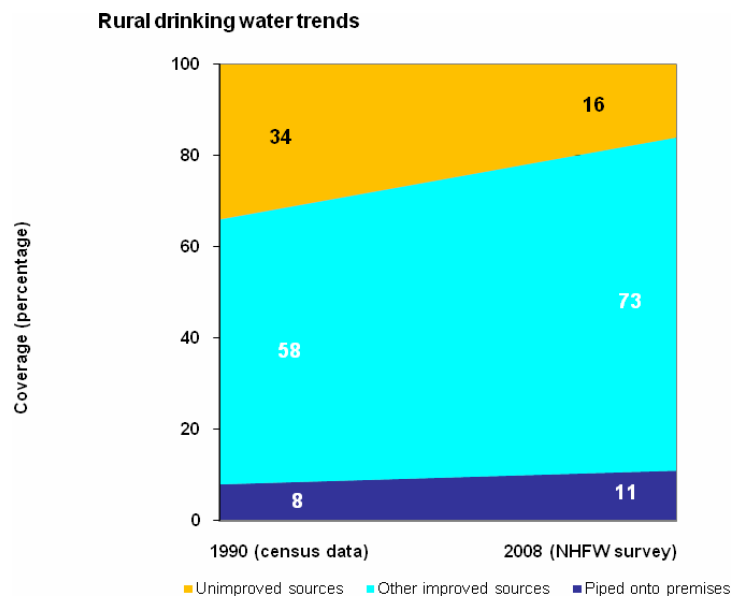
- a) In line with NRDWP guidelines as of 1st April, 2009, the inclusion of newly formed peri-urban habitations and new habitations even those with less than 100 persons.³
- b) Slippage of covered habitations due to poor O&M and drying up of sources.
- c) Increase in population and growth of settlements.
- d) Increased testing of sources and improved knowledge of quality affected areas.
- e) Increasing contamination of sources due to deeper drilling of borewells into quality affected aquifers, contamination with untreated sewage, industrial effluent, and agricultural fertilizers and pesticides.

The number of piped water supplies in rural areas is rapidly increasing, driven in part by water resource constraints, but increasingly because people want a higher level of service. In 2010, about one third of rural households already use piped water, and about one third of those have a house connection. The achievements of the last two decades in the RWS sector in India are shown in the figure below from the JMP Report 2008. However it should be noted that there are significant inequalities between the rich and the poor and this needs to be addressed in moving forwards. For example, while about 32% of the rich people have piped connections on their premises, only about 1% of the poorest have this facility.⁴ This corroborates well with some field surveys which indicate that expenditure on the SC/ST population is proportionately less than on the rural population as a whole.⁵

³ This replaces the previous definition of coverage which was based on 40 lpcd, with a safe source for all permanently settled populations of 20 households or 100 persons.

⁴ Analyzed by UNICEF in 2010 based on data from National Family Welfare and Health Surveys in 1993, 1999 and 2006.

⁵ All India Impact Assessment Study of ARWSP during 2004-2007.



The Challenges:

The Eleventh Plan document identifies the key issues facing the sector. The main ones are deteriorating **source sustainability** resulting from over-extraction of groundwater in large part due to irrigation demand for agriculture, **water quality** problems including arsenic and fluoride contamination and bacteriological contamination due to lack of sanitation which kills hundreds of children every day from diarrhea, and poor **operation and maintenance** including neglect of replacement and expansion resulting in rapid deterioration in the quality of water services. The other major challenges are related to **inter-sector coordination**, continuous **professional support** to GPs/ communities and emerging **climate change** challenge.

Source sustainability: *One of the most critical challenges that face rural villages is to secure an adequate source of water in terms of quantity and quality. Since 1947, with increasing growth of the population the per capita water availability has fallen from over 5,000 m³/year to about 1,700 m³/year. This is due to massive over-exploitation of groundwater mostly to meet irrigation demand and increasing scarcity in drinking water during summer months. The status of groundwater development is more than 100% in the States of Delhi, Haryana, Punjab and Rajasthan. More than 15% of the total blocks in the States of Andhra Pradesh, Delhi, Gujarat, Haryana, Karnataka, Punjab, Rajasthan and Tamil Nadu are over-exploited or critical in terms of ground water development. Due to deeper drilling of aquifers, drinking water sources are increasingly becoming contaminated with natural contaminants like fluoride, arsenic and salinity.*

In terms of water resources regulation, critical issues facing the sector concern inter-sectoral distribution, bulk water tariffs and water resource management. In particular,

ensuring that drinking water receives priority especially during scarcity and drought is a challenge because irrigation demand dominates water demand. The current distribution of water resources in the country is about 86% percent for agriculture, 6 percent for industries and 8 percent for domestic uses. With increasing industrialization the share of industry is set to rise. The comparable share of industry in rich industrialized countries is more than 50%. The share of domestic water use will also rise with increasing urbanization and demands of rural households for urban levels of amenities and services.

| *There is lack of a holistic approach to water resources management with communities taking the lead in preparing their own water balance to ensure that they manage their available surface water, groundwater and rainwater resources and competing demands for drinking water, irrigation and industry.*

| The Planning Commission in its Mid-Term Appraisal of the 11th Plan progress and the 13th Finance Commission Report recommend establishment of independent water resources regulatory bodies at state level. The 13th Finance Commission has earmarked a conditional grant of Rs. 5,000 Crores for this purpose.

| **Water Quality:** As indicated earlier, at present about 11% of habitations face water quality issues due to chemical contamination. Out of the 1,79,999 quality-affected habitations, arsenic contamination is reported in 9,504 habitations of 9 States, fluoride contamination in 33,363 habitations of 18 States, salinity, both in inland and coastal areas, in 32,689 habitations of 17 States, iron contamination in 101,872 habitations of 22 States and nitrate contamination is reported in 2,571 habitations of 9 States. These contaminations are either natural or associated with over-exploitation of groundwater.

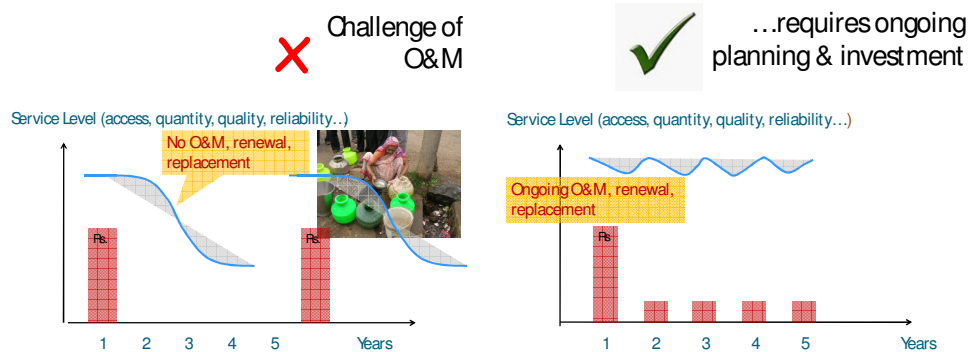
| On the other hand many more sources report bacteriological contamination, especially during rainy season and the main reason is unsanitary behavior of local population.

| The main issues in dealing with water quality are related to: weak legislation and enforcement of water quality standards and testing protocols, weak provider accountability with respect to quality of water provided and lack of awareness amongst rural citizens about the importance of safe water.

| **Operation and Maintenance:** *Another major challenge is to move from a project mode which focuses on creating infrastructure, to a programme mode which focuses on providing, improving and sustaining high standards of drinking water supply services.* Decentralization puts planning, implementation, operation and maintenance in the hands of beneficiaries. This creates ownership and commitment to action. It has been the goal of successive rural water reform programmes in India since 1999. The Sector Reform Programme (1999-2002) and Swajaldhara (2002-2008) have promoted a bottom up, "demand responsive" community based approach that has now been mainstreamed in the National Rural Drinking Water Programme (2009).

| It is clear that local government and communities cannot succeed on their own. They need to be given clear-cut roles and responsibilities. These include Panchayat Raj institutions, line departments, training institutions, and the local private sector and

NGOs. Before the NRDWP Support fund was created there was no provision for regular funding of Support activities under the main programme. Furthermore, the PHEDs have been concerned with physical progress and financial disbursement, not longer term sustainability. As a result, the dominant approach to service delivery has remained supply driven and characterized by large investments in schemes and works, followed by deterioration of the infrastructure and long periods with *low levels of service* while communities wait for the government to rebuild the schemes.



Inter-sector coordination: Government of India has established many flagship development programmes to improve rural health and livelihoods and provide sustainable infrastructure. These include MNREGS, Watershed Development Programmes, BRGF, NRHM, ICDS, TSC, SSA and NRLM. However, there are multiple institutions involved, varying 'rules of the game' and replication of projects which overwhelm village communities. There is an urgent need for convergence towards common objectives.

Continuous Professional Support: The rural water sector has suffered so far from a lack of continuous institutionalized support and a programme for strengthening professional capacity. By focusing on a project mode of delivery, capacity building in rural water has been directed at infrastructure planning and implementation. State governments have generally adopted a top down approach to identify 'shelves' of schemes and works for financing, based loosely on priorities for uncovered habitations and quality affected areas. But while many GPs and VWSCs have had facilities handed over to them, they have mostly lacked the financial and technical skills to independently manage and operate their new sources and systems. In addition, they have lacked the knowledge and experience to contract these skills. More recently, progress is being made through the establishment of Water and Sanitation Support Organisations, District Water and Sanitation Missions and Block Resource Centres.

Perhaps the most important lesson over the past twenty years of rural water supply is that local government and communities should not be abandoned once project infrastructure has been built. They need continuous support including training, technical support, access to professional services and financing to supplement their own revenues.

Climate change – identifying key risk areas and potential opportunities. The 2009 Conference of the Parties to the United Nations Framework Convention on Climate Change meeting in Copenhagen, and the latest Intergovernmental Panel on Climate Change (IPCC) Report (2007), has confirmed the consensus amongst scientists and policy makers that human-induced global climate change is now occurring. The Copenhagen meeting also confirmed the need for action to mitigate and adapt to climate change. India has recently signed the Copenhagen accord, agreeing to work with other nations to address the issues and threats posed by *climate change*. The major threats from climate change are rising temperatures, increased droughts, increased flooding, long-term wastage of the region's snow and ice stores, saline intrusion from rising sea levels, and a more variable monsoon with unpredictable intermittent breaks in the monsoon.

Part Three: Strategy

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Based on the above analysis and extensive national consultations⁶, the Department of Drinking Water and Sanitation has identified four *Strategic Objectives* to address the challenges in the sector and achieve its goals, namely: 1. **Enable Drinking Water Security Planning and Implementation** encompassing participatory integrated water resource management, water security planning and implementation at village, district and State levels, conjunctive use of surface water, groundwater and rainwater harvesting; 2. **Water Quality Management** to ensure safe drinking water supply, which is based on ensuring water safety with verification by water quality testing; 3. Institutional, financial and regulatory frameworks and convergence of different development programmes to **Strengthen Decentralised Governance**; and 4. Training and technical support to build and incentivise **Professional Capacity** in the sector.

1. Enable Drinking Water Security Planning and Implementation

1.1 Participatory Integrated water resource management. A Holistic approach with active community and PRI participation in all villages, especially in water stressed areas, should be followed to ensure drinking water supply as in the Andhra Pradesh Farmer Managed Groundwater Systems project. This should take into account availability of water through groundwater, surface water, rainwater and seawater (where applicable) sources; allocation of water to irrigation, and for domestic purposes; and reuse and recycling of wastewater. Strategies should include a water budget with community monitoring of water tables to balance demand (especially irrigation and industrial demand) with available water as well as local measures for rainwater harvesting and groundwater recharge. Waste water should be managed to prevent contamination and for reuse and recycling.

⁶ The DDWS organized four rounds of Regional Consultation Workshops at Chandigarh (18th June 2010), Guwahati (on 18th August..)Bangalore (9th July 2010), Gandhinagar (on 26th August, 2010) to discuss the challenges and way forward with various sector experts from government, NGOs, academics and media.

Andhra Pradesh Farmer Managed Groundwater Systems (APFAMGS) project's key premise is behavioral change leading to voluntary self regulation. In seven drought prone districts of Andhra Pradesh, thousands of farmers residing in 638 habitations have voluntarily taken a number of steps to reduce groundwater pumping, for tiding over the problem of groundwater depletion. The main intervention of the project is the capacity building of the farmers in the catchment Hydrological Units (HUs) on water budgeting and collective decision making.

The project introduced two key measurement devices. The first is the rainwater gauge to measure the rainfall in their areas. The second is the long rope scale to measure the depth of groundwater in observation wells. The farmers groups were trained to collect and use data from these two sources to calculate the potential ground water availability in each season. This knowledge has empowered the farmers to collectively make their own decisions on water entitlements, crop water budget (CWB), changing crops to suit the water availability and planning recharge measures to enhance groundwater recharge potential.

The efforts have led to significant changes in the overall situation in a short 3 year period from 2005 to 2008. Out of 53 Hydrological Units (HUs) the groundwater balance has increased in 57% HUs, remained constant in 34% HUs and decreased only in 9% HUs. Similarly out of 58HUs the groundwater pumping has reduced in 55% HUs, remained constant in 31% HUs and increased only in 14% HUs. About 4800 farmers in the 638 habitations have voluntarily adopted water saving methods in one form or the other without losing the incomes from agriculture. This project demonstrates the power of building capacity of local organizations to collect real time data, process it and make local decisions and regulate water use.

1.2 Water security planning and implementation at village, district and State levels. Participation of local government and communities is the cornerstone for sustainable development. States, districts and villages should adopt a mix of top-down and bottom up planning approaches to service delivery based on Water Security Planning and implementation with training institutions, NGOs and the local private sector providing a supporting role. At the village level, GPs and VWSCs should be guided to make informed choices regarding appropriate technologies so that they get the services they want. The NRDWP prioritises coverage of remaining uncovered habitations, slipped back habitations and water quality affected habitations. Planning and implementation should prioritise SC/ST, poor and minority households/habitations and the role of women, make provisions for schools, anganwadis and livestock, and adopt strategies to cope with natural disasters. Cases of isolated rural houses where households have their own private safe and adequate drinking water sources would be considered as covered.

Village Drinking Water Security Plans and Implementation

Efficient and effective operation depends upon sound village water supply strategies made up of (a) A Water Source Sustainability Plan and implementation that provides sufficient quantity of good quality drinking water to meet demand throughout the year,

including water harvesting and groundwater recharge measures for the drinking water sources, (b) A Water Safety Plan that describes how water quality will be managed from source to mouth (point of consumption), (c) An Operating and Maintenance Plan of the water supply scheme which describes standard operating procedures and balances expenditure and income, and (d) a Service Improvement Plan summarizing provisions for new infrastructure, replacement, expansion and optimization of production cost.

In addition, there should be promotion of awareness directed at water conservation and household water storage and handling. (Issues such as hand washing, excreta disposal and solid waste management being covered under other government programmes).

Source: *Department of Drinking Water and Sanitation, A Handbook for Gram Panchayats to Help Them Plan, Implement, Operate, Maintain and Manage Drinking Water Security*

1.3 *Conjunctive use of surface water, groundwater and rainwater harvesting.* All rural habitations irrespective of the number of households should have access to a safe and sustainable source or sources.⁷ Conjunctive use of surface water, groundwater and rainwater sources offers the best chance of ensuring adequate supply all year round at the least cost. Where villages, such as those in semi arid areas, are not able to find local solutions the State, District or Block will need to take responsibility. For example, States may consider regional grids or multi village schemes to provide water to districts, blocks and groups of villages. Unbundling bulk supply and retail distribution can ensure that local governments and communities manage distribution, while PHEDs manage bulk supplies.

2. Drinking Water Quality Management:

The focus of this strategy is to ensure that the water supplied to rural citizens meets the national water quality standards. In investments under NRDWP priority should be given for coverage of quality affected habitations. The strategies to ensure drinking water quality will broadly be protection, monitoring and surveillance and treatment. Improvement programmes should be based on village water safety planning and implementation with verification by water quality testing.

2.1 Legal and Institutional issues: The DDWS, in coordination with state governments and appropriate national agencies, will strive to make the national water quality standards mandatory in a phased manner. This involves strengthening existing legislations and also issuing necessary guidelines to the service providers.

2.2 Drinking Water Safety Planning and Implementation:

⁷ This replaces the previous definition of coverage which was based on 40 lpcd, with a safe source for all permanently settled habitations with populations of 20 households or 100 persons or more.

2.2.1 *Source Protection*. Existing drinking water sources and freshwater resources in general should be protected by implementation of the Total Sanitation Campaign to make villages open-defecation free and maintain a clean environment; by safely disposing of solid and liquid wastes; by ensuring the control and treatment of industrial effluents; and by raising awareness about impacts of use of high concentration of fertilisers and pesticides on water. The regulatory authority of the CPCB, SPCBs and the Water Quality Assessment Authority will be applied to protect the quality of drinking water sources polluted by industrial effluents and untreated sewage.

2.2.2 *Monitoring and surveillance*. Modern methods of *water quality monitoring and surveillance* should be provided in all districts and sub-district level laboratories and adopted for all drinking water sources and systems (water safety to prevent contamination with verification by water quality testing) along with standard operation and maintenance procedures. VWSCs will be trained in preparation and implementation of water safety plans, and protocols introduced for water quality testing based on Field Test Kits and District and Sub-divisional water quality testing laboratories.

2.2.3 *Treatment*. Cost effective solutions are needed. Dilution of chemically contaminated sources in case of fluoride and salinity is a cost effective option that should be promoted. Roofwater harvesting, development of traditional village tanks/ponds/wells to make them safe can provide safe water for cooking and drinking. Alternate safe sources are generally preferred in case of arsenic affected areas. Chemical treatment of water may be taken up in cases of bacteriological and chemical contamination where the other options are not available. In addition to chemical contamination, there should be focus on measuring, reporting and tackling bacteriological contamination in sources, storage, transmission, delivery points and within households during storage and use.

Regulation: Water quality monitoring and enforcement will be part of the regulatory mechanisms existing/ designed by various agencies- described in section 3.3.

3. Decentralised Governance

The RWS sector should promote the overall programme for decentralization set forth in the Constitution and the NRDWP Guidelines and strengthen the implementation approaches adopted by the government.⁸ Diversity of conditions in the States will be recognized. The major issues related to strengthening sector decentralized governance are: clear policies, appropriate institutional arrangements, financing mechanisms and appropriate oversight mechanisms, including regulation.

3.1 Policy environment: Drinking water is a state subject and most policies have to be defined by the states in line with the Constitution and sector policies. Policies set out the

⁸ For example, the Planning Commission 'Manual for Integrated District Planning' (2008), and the Ministry of Panchayati Raj guidelines for, 'Planning at the Grassroots Level, An Action Programme for the Eleventh Five Year Plan' (2006).

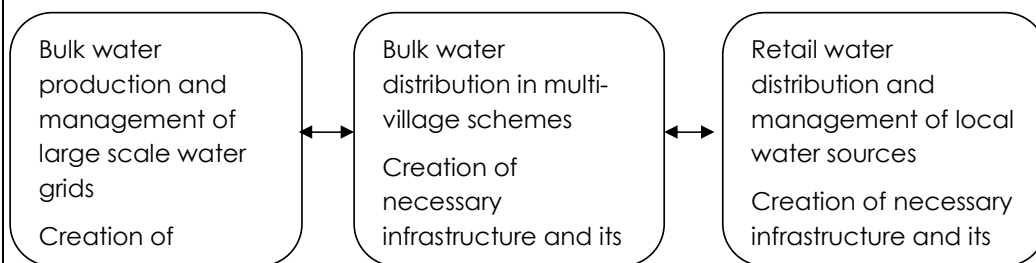
broad objectives for the sector to ensure drinking water security. The key issues include institutional roles and responsibilities (activity mapping), service standards, cost recovery/subsidies and access for SC/ST and poor habitations and households. As of 2010, very few states have a comprehensive Water policy and O&M policy. All states will be encouraged to develop appropriate policies by 2012.

3.2 Appropriate Institutional Arrangements: This again varies from state to state based on the prevailing institutional arrangements and strengths. As of date the Public Health Engineering Departments/ Boards/Authorities are providing the leadership to the sector management, perform functions related to planning, execution and in some cases O&M of schemes. However, after the 73rd amendment to the Constitution there has been a growing trend to devolve the drinking water responsibilities to PRI institutions. This devolution is at various stages in different States. The experience from some of the States has led to the understanding for a need to unbundle the sector, in order to arrive at appropriate institutional arrangements.

Unbundling bulk water production, bulk water supply and village distribution:

Service provision can be unbundled in terms of bulk water production, bulk water distribution, and retail water distribution including management of local water sources. Unbundling and corporatization of sector functions of production, bulk transfer and distribution have been done in some States. Other States should study and appropriately develop their own institutions.

It should be recognized that the three functions need different levels of capability in management and operations and can be assigned to the appropriate institution or level of government.



Based on the emerging experiences in the country and elsewhere the following options can be considered.

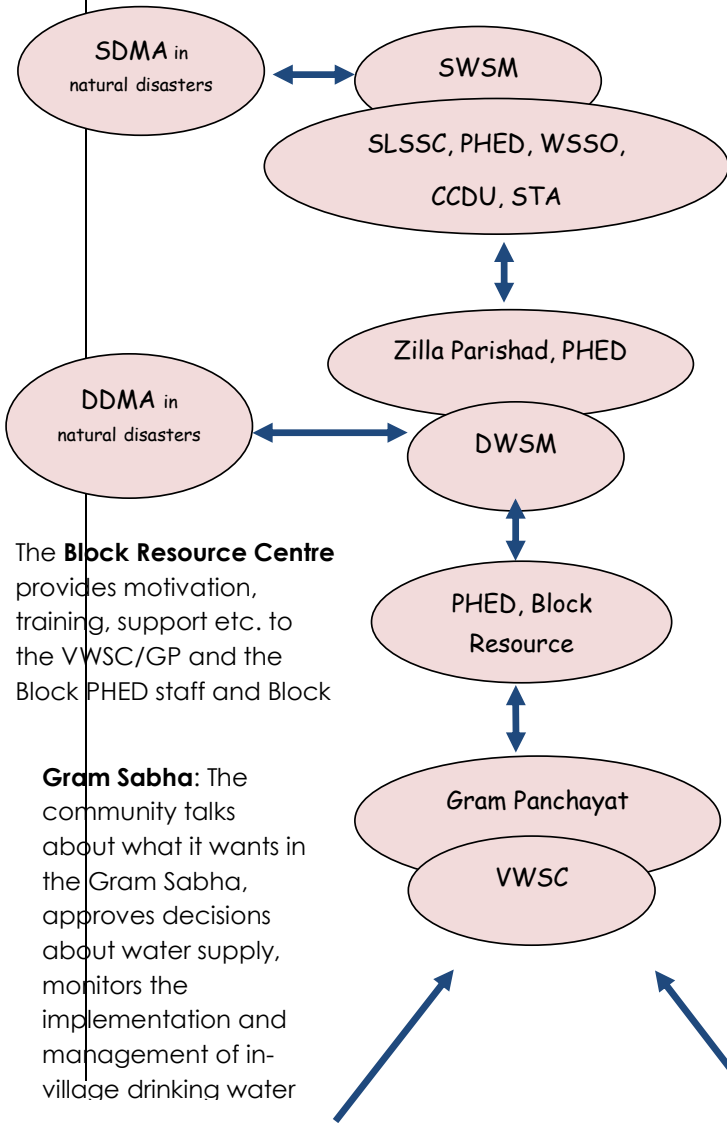
- **Bulk water production.** Highly specialized agencies are required for design and maintenance of bulk water production. This involves skills related to engineering, construction management, hydro-geology, financing, etc. There would be a need to serve different stakeholders such as drinking water, irrigation and industry, and deal with different ministries / departments.
- **Bulk water distribution.** Many states have taken up multi-village schemes with piped bulk water supply to a group of villages and in some cases towns or local

industries. The end customers are the GPs and/ or ULBs who are responsible for distribution.

- **In-village water management.** This is the responsibility of GPs/VWSCs with appropriate institutional support.

Such an approach will provide needed clarity on roles and responsibilities for various institutions within the state. The NRDWP guidelines articulated well the roles and responsibilities of various actors which are summarized in the chart below.

Suggested institutional Structure in States



State support: SWSMs provide policy guidance, and water security planning at State level; SLSSCs approve schemes and support activities to be taken up and review implementation progress and operational performance; WSSOs deal with software aspects of RWS; STA and PHED...

District support: ZPs/DWSMs undertake water security planning and implementation at district level; help organize financing, training and technical support, and review plans and monitor implementation and

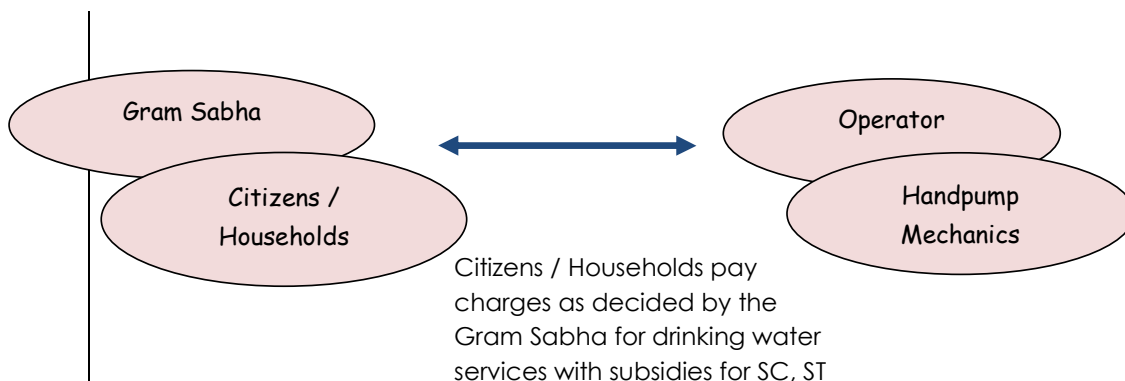
The **VWSC** is a standing committee of the **GP** and is responsible for planning, implementation, operation, maintenance and management of in-village schemes/distribution network and providing annual reports on progress and performance

Service Contract: Contracts set out handpump mechanics' and operators' tasks and

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The **Block Resource Centre** provides motivation, training, support etc. to the VWSC/GP and the Block PHED staff and Block

Gram Sabha: The community talks about what it wants in the Gram Sabha, approves decisions about water supply, monitors the implementation and management of in-village drinking water



3.3 *Financing*. It is desirable to align financing with village/district plans so that investments are linked to service outcomes, i.e., they are performance based. Financing should not be a one-time grant. Water security planning requires annual investments in new schemes and works, operation and maintenance, replacement and expansion as well as support activities like water quality testing and IEC. States should establish clear policies for Operation and Maintenance including service standards and cost recovery, and may like to ensure that their policy on cost recovery provides SC, ST and BPL households with appropriate subsidies in user fees. In addition, it is critical for VWSCs to establish a corpus fund from discretionary grants and user fees to meet future costs of replacement. The table below summarises the key needs and available funds under NRDWP and other Government schemes as of 2010.

Rural water supply schemes are predominantly financed from public funds. State Governments can tap private sources of financing through PPP models like in the PURA scheme to supplement public funding with suitable safeguards to ensure universal supply of a minimum quantity of drinking water to all families without social or financial discrimination.

The allocation for O&M under NRDWP should be reduced from 10% in 2010 to 5% in 2017 phased out in 2022 and the reduction should be diverted for Renovation and Modernization(R&M) costs increasing from 5% in 2017 to 10% in 2022.

| Key needs | Available funds (as of 2010) |
|---|---|
| New schemes, augmentation, expansion of existing schemes. | NRDWP – coverage State Plan, BRGF, DoNER funds and Externally Aided projects, MoMA, Others |
| Source sustainability (rainwater harvesting, groundwater recharge, development of traditional structures) | NRDWP - sustainability MNREGS, Watershed Development Programmes, Others |
| Operation and Maintenance (including minor repairs) | NRDWP – O&M Central and State Finance Commission grants User charges, Gram Panchayat revenues, State Plan and non-Plan grants/subsidies, Others |

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| Replacements | NRDWP – Coverage (and later under a Renovation and Modernisation component to be introduced) VWSCs corpus fund which can include funds from BRGF, Central and State Finance Commission grants, and user charges, Others | Formatted: Justified |
| Potable water in water quality affected areas (treatment technologies, new sources - to address arsenic, fluorides, iron, nitrates, salinity, etc.) | NRDWP - water quality State Plan, BRGF, DoNER funds and Externally Aided Projects, MoMA, Others | Formatted: Justified |
| Water quality monitoring and surveillance | NRDWP – support Others | Formatted: Justified |
| Training and IEC | NRDWP – support BRGF, TSC, Others | Formatted: Justified |
| Water Supply in Natural Disasters | NRDWP – natural calamities NDRF, SDRF | Formatted: Justified |

3.3 Convergence of different development programmes. **District or Block Water Security Planning** is required to optimise the use of water resources within the constraints of financial and human resources to meet the basic needs, manage convergence of different development programmes, and take decisions about broader water resources management and investments. Convergence takes place at all levels but it is the DWSMs responsibility to coordinate matters relating to water and sanitation among district representatives of Health, Education, Forests, Watershed Development, Agriculture, Rural Development, Urban Development, Women and Child Development etc., and National programmes/grants such as SSA, NRHM, ICDS, IWMP, BRGF, MNREGS, AIBP, JNNURM, 13th FC etc. They should follow the Guidelines for Effective functioning of SWSMs and DWSMs issued by DDWS.

3.4 Oversight mechanism (including Regulation): This refers to a set of arrangements that oversee the implementation of policies and various actions by designated organizations and ensure adherence to rules and regulation. It might not be possible for one organization to play this role and hence can be played a set of organizations based on their expertise and location advantage. The tiered approach to oversight can be summarized as:

- *Gram sabha*: At the village level, monitoring and approving the activities carried out by the GP/ VWSCs. This can also include local regulation on water resources use and conservation. Water budgeting, Social audits etc can be appropriate tools at this level.
- *Zilla Parishad/ DWSM*: At district level monitoring the activities and services provided by various sector agencies (GPs, PHED etc) and ensuring that they are adhering to the sector policies and rules. The ZPs should also establish appropriate grievance redressal systems to capture citizen's voices. The role of the district can be seen as planning coordination.
- *Various State agencies*: This can be the existing state level agencies like the : SWSM for over all sector coordination, State Pollution Control Boards for water quality issues, especially industrial and urban effluents, sector regulators like:

Water Resources Regulatory Authority (WRRRA) for ensuring water resources allocations and its use⁹.

The Central Ground Water Authority should notify over-exploited blocks to regulate further abstraction. The Water Quality Assessment Authority should regulate quality standards and testing. States need to introduce legislation for water resources regulation as a priority to address concerns regarding distribution of resources for different categories of users, improving water use efficiency, tackling impacts of climate change, priorities during scarcity and bulk water tariffs.¹⁰ With respect to rural drinking water, there is a need for States to establish processes for setting service standards and tariffs, customer grievance redressal, water quality monitoring, ground water abstraction and environmental pollution. There is also a need to put in place the necessary procedures for effective monitoring, audit and reporting on preparation, implementation and performance of village water supplies which can support M&E systems which focus on demand side outcomes.

It may not be possible for a single State level *regulator* to be able to reach out to many numbers of localised water supply services. The NRDWP advocates a number of steps to build the foundation for regulation: District Water and Sanitation Missions have the responsibility of 'coordination' to check that village plans meet policy objectives and are what communities want; assess technical, financial and operational viability; facilitate financing, and monitor progress and performance. At the local level, village social audits involving the Gram Sabha and mechanisms of customer grievance redressal need to be established.

District planning coordination

The importance of district planning coordination for rural water supply is that it provides an institutionalized means of scaling up and capacitating village planning, as well as coordinating planning within the district vertically (from villages to blocks to the district), horizontally (at least between water, environmental sanitation and health, and source conservation and protection) and spatially (between villages and towns, where common water resources are to be utilised). A planning coordinator's job includes reviewing plans in terms of service levels vis a vis costs, providing advice on tariffs and subsidies, and monitoring implementation and performance.

Source: Planning Commission, Guidelines for Integrated District Planning

4. Professional Capacity

4.1 Training. DDWS and States should develop appropriate job specifications and training programmes based on new roles and responsibilities to capacitate the

⁹ Various states governments are in different stages of setting up state level water resources regulatory authorities. The Maharashtra Water Resources Authority (MWRRA) was the first state level regulator to be established and various states governments are in different stages of setting up such state level water resources regulatory authorities. One of the roles of the regulator is to ensure allocation of water resources as per state decided entitlements and monitor its use.

¹¹ Examples include APFARGMS with measuring groundwater, and Dakshin Kannada District in Karnataka with metered household connections and volumetric tariffs.

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new approach to rural drinking water. Key Resource Centres, NIRDs, SIRDs and other training institutions have a key role in developing appropriate modules and materials and delivering a combination of class room and field based training programmes. Village Water Security planning and implementation lends itself to a process of learning by doing, which should be the basic principle for such training.

Key Resource Centres:

People and organizations working in the drinking water and sanitation sector need to be sensitized to the change in their role and responsibilities to cope with various critical issues facing the sector. Knowledge, skills and attitudes need to be enhanced through continuous professional development and capacity building by sector specialists through appropriate organizations.

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Towards this end, the Department of Drinking Water & Sanitation has identified about 25 National Key Resource Centres, institutions of repute having experience in imparting training and capacity building of different stakeholders in the water and sanitation sector. The National KRCs will be engaged in more than one State in capacity building, reorientation of different stakeholders through IEC, disseminating knowledge and information, documenting best practices, etc. targeting various stakeholders like PHED engineers, SWSM, DWWSM members and staff, Master Trainers of VWSCs, PRIs, NGOs and SHGs et al.

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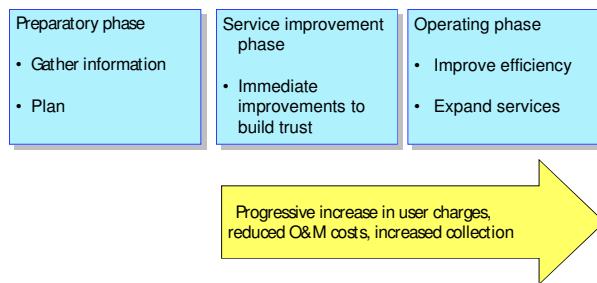
4.2 *Technical support.* SWWSMs, DWWSMs, GPs and VWSCs need technical support to help them plan and implement and maintain village water security systems. This can be facilitated by Block Resource Centres, PHED engineers, DWWSM, Key Resource Centres, educational institutions, scientific and research institutions and NGOs.

4.3 *Outsourcing.* GPs should be guided to explore options to access professional experience and skills for operation and maintenance. States should support the GPs with appropriate knowledge and tools to prepare, tender and manage service agreements with community based, public or private handpump mechanics, contractors, piped water supply operators and other service providers. Care should be taken while drawing up such service agreements that the basic requirements of poor households to minimum service levels are not violated under any circumstances.

Service Agreements

Whether the water supply system is being operated by community based technical and operational staff, a public utility / department, or a local private entrepreneur, a service agreement is a very useful tool. Service agreements set out the operators' tasks and what they will be paid, and as such can be used to provide guidance and incentives to gather information, plan and implement as effectively and efficiently as possible. If local entrepreneurs are involved then other advantages include management expertise, tariff / financial discipline and access to private capital. In addition, performance indicators provide the basis for monitoring implementation and performance, including demand side outcomes.

Operator contracts



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Part Four: Implementation Plans

Drinking 'Water Security' means providing "every rural person with adequate safe water for drinking, cooking and other domestic needs on a sustainable basis", (NRDWP guidelines, 2010). It must therefore include measures to address source sustainability, water quality and operation and maintenance. This also requires appropriate institutional, financial and regulatory (monitoring) support, as well as needs based training and technical support or access to professional service providers.

As discussed in Part Three the five *Strategic Objectives* to achieve the overall goal of drinking water security are as follows:

1. Drinking Water Security

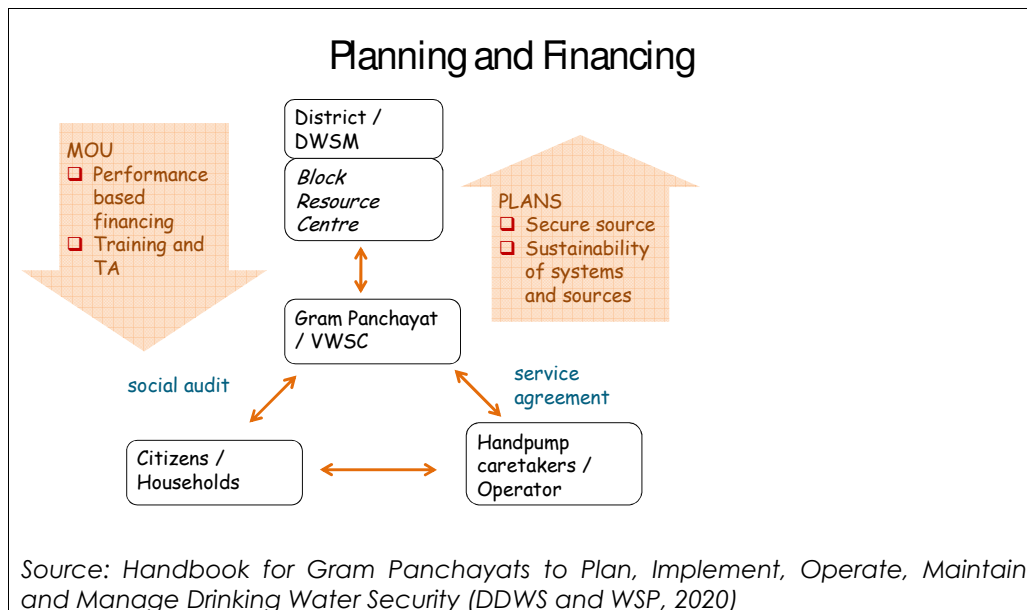
- Integrated Water Resource Management* at village, district and State levels including *Conjunctive Use* of rainwater, groundwater and surface water and provision of *Bulk Water Supply* as needed
- Water Source Sustainability measures implemented* at village level including *Water Harvesting* and *Groundwater Recharge* measures

2. Water quality Management

- A *Water Safety Plan* implemented at village level to prevent contamination before it happens
- Verification through *Water Quality Testing* including field test kits and district and sub-divisional water quality testing laboratories

3. Sustainable Service Delivery (Operation and maintenance)

- a. *Operation and Maintenance* measures implemented at village level to ensure skills and finance for operation and maintenance, replacement and expansion
- b. Service agreements for handpump mechanics and piped water supply operators



4. Strengthen Decentralised Governance

- a. *Institutional Roles and Responsibilities* to support water security planning and implementation (source sustainability, water quality and O&M)
- b. *Results Based Financing* of drinking water security plans
- c. *Regulation* including monitoring of progress and performance

5. Build Professional Capacity

- a. Training to capacitate new roles and responsibilities
- b. Technical support
- c. Outsourcing including handpump mechanics and piped water supply operators

The Strategic Objectives can be achieved through an appropriate mix of implementation initiatives. Most of these are set out in the National Rural Drinking Water Programme guidelines (DDWS, 2010) and other publications of the DDWS. Other key options are set out below, as identified in regional consultation workshops held with all States and other stakeholders. **Each State can formulate its own Implementation Plan depending on its needs, capacity and resources, and establish a timeframe for**

achieving the Strategic Objectives. Part Five provides some Key Performance Indicators which can be used to monitor progress.

1: Drinking Water Security

These implementation measures encompass *Integrated Water Resource Management*, including conjunctive use, planning and implementing drinking water supply projects and ensuring source sustainability. The measures are set out below:

1.1 Integrated Water Resources Management

- **National level:** The DDWS, through the National Water Mission and the National Drinking Water and Sanitation Council, prepare a convergent approach with the Ministries of Water Resources, Agriculture, Environment and Forests, Power, Industry and others. The Central Ground Water Authority will be requested to regulate drilling of non-drinking water supply wells in over-exploited blocks. The Water Quality Assessment Authority, Central Pollution Control Board and the National River Conservation Directorate will be requested to identify and take steps for suitable prevention and regulation of pollution of drinking water sources.
- **State level:** The SWSM with the Irrigation, Agriculture, Environment and Forests, Power, Industry and Aquaculture Departments, would promote a common State Water Policy addressing the availability of overall water resources and water requirements of irrigation, rural and urban drinking water, and industry. In this context, the steps to be taken to meet the needs of domestic water, as the priority, would be agreed by the different sectors. This would include monitoring of ground water levels and rainfall at sub-block levels, monitoring and regulating over-abstraction of ground water in over-exploited blocks, water efficient agricultural practices, recycling and reuse of wastewater, water treatment by industry, and environmental water protection from industrial effluents, fertilizers, pesticides and untreated sewage. Stress will be laid on the roles of Irrigation and Agriculture Departments in increasing efficiency of water use in agriculture.
- **District level:** The DWSM would prepare a District Water Vision based on the availability of overall water resources and water requirements for irrigation, rural and urban drinking water, and industry. It should systematise the monitoring and recording of groundwater levels and rainfall at sub-block or GP level. Based on this plan it should take steps in coordination with Agriculture and Irrigation Departments for diversification of cropping patterns, appropriate sowing calendars to reduce abstraction of groundwater, improve water-use efficiency in irrigation, ensure reduction, reuse and recycling of water by industry, environmental protection of drinking water sources, ensure open-defecation free villages, and cost-effective management of solid and liquid wastes. It should draw up plans for water harvesting and groundwater recharge structures to benefit drinking water sources on a watershed basis using Ground Water Prospects maps, GIS and Watershed Development Department technical inputs. These would be done on a priority basis for over-exploited, critical and semi-critical blocks. The works planned on this basis would be taken up under MNRGS, NRDWP (Sustainability) and IWMP.
- **Village level:** At the village level water security planning should start with knowledge of water resources management in the village, aquifer or watershed. A **water budgeting exercise** should consist of understanding water resources available, and methods of increasing the utilisation of available water resources,

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water requirements of different sectors like drinking water, livestock, agriculture, industry and commerce. **Monitoring** of ground water levels and rainfall with rain gauges will lead to knowledge of availability of water resources. Understanding of **water conservation and recharge** should lead to planning of water harvesting and groundwater recharge structures which maximise recharge and minimise evaporation losses. **Demand management** of water by the irrigation sector would focus on use of less water intensive crops, efficient irrigation methods like drip and sprinkler, reuse and recycling of water, and regulation of groundwater over-abstraction.

- The **water budgeting exercise** should culminate in arriving at a shared **Village Water Vision** on managing this resource and equitable allocation for landless villagers and land holding agriculturists while protecting the domestic requirements. This collective approach requires considerable work with by trained persons with the villagers. The Village Water Vision should deal with the impacts of declining ground water tables, increasing competing demands and vagaries caused by climate change.

Conjunctive use and bulk water supply

- All habitations should move from dependence on a single source to conjunctive use of rainwater, groundwater and surface water sources.
- States or districts can consider regional grids or multi-village schemes based on surface sources wherever feasible to supplement in-village sources, especially in drought prone areas.
- Services of qualified hydrogeologists should be made available to support the PHED, DWSMs, BRCs and VWSCs in all districts.
- GIS mapping of sources, water bodies and inter-village pipelines should be done to help prepare district and regional drinking water security plans, identify uncovered habitations, design schemes and reduce duplication in planning and investment.

Universal access and participation

- From 2013, planning, investment and implementation of all new single-village piped water supply schemes or in-village distribution systems of multi-village schemes should be preceded by constitution of Village Water and Sanitation Committees, their training, and their preparing their Village Water Security Plan with approval by the Gram Sabha/GP and implementation by the GP/VWSC.
- All new drinking water supply schemes should be designed, estimated and implemented to take account of the water supply cycle, with (i) recharge and water conservation structures wherever necessary and feasible, for the sources, (ii) constitution, training and support to VWSCs to plan, implement, operate, maintain and manage the schemes (in-village), and (iii) waste water management through stabilisation ponds and other options by convergence with MNREGS, TSC, etc.
- Communities should be enabled to plan and implement schemes to have piped water supply with metered household connections and volumetric tariffs with appropriate cross subsidy for SC/ST and BPL households.

- Where households within a habitation are self providing (for example, they have installed their own shallow hand pump or open well), the GP/VWSC still has a responsibility to ensure that they have an adequate supply of safe drinking water. The GP/VWSC can (i) provide public taps/ handpumps, (ii) provide water quality tests, and (iii) provide the services of a qualified mechanic for preventative maintenance.
- GPs/VWSCs should ensure a minimum level of safe drinking water and sanitation for transient communities. For example, enterprises and contractors should be held accountable for providing the minimum level of safe drinking water and sanitation facilities for migrant labourers and in their labour colonies.
- All government schools and anganwadis will be provided with water supply for drinking and for toilets in adequate quantity by convergence of NRDWP for existing schools and SSA for new schools set up under SSA. For private schools, supply of water will be ensured by enforcement of the provisions of the Right to Education Act by the Education Department.
- It will be ensured that the allocations for SC and ST concentrated habitations under NRDWP are utilized for the planned purpose. Proportionate allocation and expenditure will be made under NRDWP in minority concentrated districts.
- Women should be included in all aspects of decision making with respect to drinking water security planning, implementation, operation, maintenance and management.
- Waste water treatment and recycling should be an integral part of every water supply plan or project. Management of liquid and solid waste should be promoted together with recycling and reuse of grey water for agriculture and groundwater recharge and pollution control.
- Design of schemes for peri-urban areas should factor in the requirements of increasing population and increasing per capita demand in the planning stage itself so as to avoid wasteful expenditure. SWSMs can make special provisions to ensure peri-urban areas get the level of services demanded by the inhabitants.

Source sustainability

- The GP/VWSC should plan, prepare and implement Source sustainability water harvesting and groundwater recharge measures for all existing sources of drinking water schemes, wherever feasible and required using Groundwater Prospects Maps.
- All plans and estimates of new schemes for drinking water supply should include provision of source sustainability measures, wherever feasible and required using groundwater prospects maps and GIS tools.
- Community management includes measuring water tables using simple or automated rain gauges and rope measures and preparing a water budget to match demand (especially for irrigation) and available water.¹¹
- Water harvesting and groundwater recharge structures should be planned on watershed basis and adopted to augment available water. However, hydro-geologists should assess overall impacts of reduced runoff including reduced inflows to tanks.
- The GP/VWSC should also rehabilitate and develop traditional village tanks, ponds and wells.

2: Water Quality Management

Modern methods of water quality management are required based on ensuring water safety and verification through water quality testing.

2.1 Ensuring Water Safety

1. States should adopt the drinking water safety planning and implementation approach for rural supplies to prevent contamination. In order to address water quality problems, the VWSC must prepare and implement a Water Safety Plan.
2. Where possible, SLSSC and DWSCs should move away from high cost treatment technologies for tackling arsenic and fluoride contamination to rainwater harvesting and development of alternative sources for arsenic and alternative sources/dilution of aquifers through rainwater harvesting for fluoride.
3. For chemically contaminated sources, the first step should be testing, marking and switching of sources, before exploring other options on the mitigation ladder with higher costs and benefits.
4. Dual water supply may be adopted, as a short term measure, if treating all supplied water or providing minimum quantity of safe water is not feasible in rural habitations facing acute water quality problems. In these habitations 10 lpcd of safe water may be provided which would be sufficient for drinking and cooking purposes and the remaining 60 lpcd may be provided from untreated/unsafe sources for other domestic activities.
5. As an interim step before provision of safe tap water, point of use treatment such as boiling and filtration of water will be promoted through intensive awareness generation campaigns.
6. Setting up of Reverse Osmosis or any other water treatment plants which results in wastage of water or other adverse environmental impacts should be avoided except where there is no other option available.
7. The Jalmani Scheme for implementation of standalone drinking water purification systems in rural schools should be promoted in areas with iron, turbidity and bacteriological contamination.

Why is Water Safety Planning and implementation needed?

There are many advantages: i) Better management of water quality by preventing contamination before it happens, ii) It is a 'learning by doing' mechanism to achieve improved operational management, iii) It provides an approach to prioritising improvement programmes (physical and operational) based on health outcomes which emphasise customer services, and iv) It provides a concrete means of linking sanitation and hygiene to water supply.

In implementation there are other advantages. By identifying the functions required to support water safety it is possible to articulate activity mapping (roles and responsibilities), and improve needs based training programmes.

2.2 Verification through water quality testing

- The VWSC and DWSC must ensure that regular sampling and analysis takes place using field test kits and district and sub-district testing laboratories. The national protocols for water quality testing should be followed.

- The five grass roots level workers trained for testing water quality through the use of field test kits should act as ambassadors for achieving household level drinking water security. They may be paid suitable charges for the number of samples collected and sent for lab testing and disseminating test results to the VWSC and the community.
- The VWSC's responsibilities, with support from the DWSM, include maintenance of the field test kits (replacement of used materials) and meeting the sampling expenses.
- The VWSC should liaise with PHCs and NRHM workers (ASHA) to monitor incidence of diseases relating to water quality and the results must be shared with the community (Gram Sabha).
- All districts should have well equipped labs with qualified technicians. Sub-district labs may be set up by the PHED or outsourced to NGOs, educational institutions, etc. The district and sub-district water testing laboratories should have facilities to test for all notified quality parameters.
- All water quality testing labs at State and district levels, should obtain accreditation from the National Accreditation Board for Laboratories.
- Modalities for convergence of Food Safety, Health, Pollution Control, Groundwater Labs and water quality testing labs should be worked out and implemented.

3: Sustainable Service Delivery (Operation and Maintenance)

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3.1 Operation and Maintenance

- States should introduce standard operating procedures for O&M of handpumps and piped water supplies and GPs/VWSCs should identify and assign key functions to the appropriate person such as the handpump caretaker or operator.
- For handpumps, the GP or VWSC needs to be provided access to spare parts and trained mechanics by the DWSMs for regular preventative maintenance of all handpumps in the GP.
- For piped water supply systems with community standposts and/or household connections, the DWSM/BRC and VWSC needs to make sure that community based operators receive training to gain the technical and financial skills to do the job.
- Block or District Panchayats and Joint Scheme Level Committees consisting of heads of VWSCs/GPs benefited by the scheme are responsible for overseeing multi-village schemes.
- In multi-village schemes or large water grids, bulk supply should be managed/operated by PHEDs or private operators with tariffs set by the State government/PRIs/water resources regulator.
- Customer consultation and grievance redressal mechanisms should be established such as provision of a toll free number, call centres, mobile SMSs, linking GPs and engineers electronically with Block and District IMIS systems, citizen report cards and community score cards.
- Initially all bulk water supply and retail water supply to commercial, industrial establishments and private institutions should be installed with volumetric metering. Gradually all household connections should be metered.

- Water audits, energy audits and measurement of Unaccounted for Water (UfW) should be introduced for bulk and distribution piped water supplies.
- In time, optimisation of large water supply systems through technologies like SCADA should be promoted in all States.
- Standard operating procedures for coping with natural disasters will be laid down and disseminated through training and awareness generation programmes.
- GPs/VWSCs must also prepare and implement service improvement plans for prioritising repairs, replacement and expansion of source and system parts.
- Zilla Panchayats should have a Water Supply O & M Wing to provide continuous technical support to GPs in managing their water supply schemes.

Coping with Climate Change

Various adaptation measures need to be considered to address the risks of climate change. The Box below identifies the kinds of adaptation measures that can be considered.

Adaptation measures and opportunities for rural water supplies

- Redesigning the engineering codes for pipelines, water treatment, water supply systems, local dams, and irrigations systems.
- Increasing use of rain fed systems to enhance the sustainability of local water supplies.
- Introducing measures to enhance groundwater recharge following all rainfall events.
- Addressing waste water treatment and recycling waste water.
- Providing improved flood forecasting measures based on measure precipitation gauges or weather radar systems, linked to catchment models.
- Helping refine policy at national, state, and local levels to incorporate the above four tasks.
- Supporting educational systems to inform local people and also encourage research to support the above five tasks as well as development of a regional climate model which can be linked to local water use patterns to better estimate impacts of climate change.

Source: Water and Sanitation Program – South Asia, Climate Risk Screening

3.2 Service Agreements

GPs/VWSCs should explore options to access professional experience and skills for operation and maintenance, including qualified mechanics for handpump preventative maintenance and operators for piped water supplies. (See Section 5.3 on Outsourcing).

Service Agreements

Whether the water supply system is being operated by community based technical and operational staff, a public utility / department, or a local private entrepreneur, a service agreement is a very useful tool. Service agreements set out the operators' tasks

and what they will be paid, and as such can be used to provide guidance and incentives to gather information, plan and implement as effectively and efficiently as possible. If local entrepreneurs are involved then other advantages include management expertise, tariff / financial discipline and access to private capital. In addition, performance indicators provide the basis for monitoring implementation and performance, including demand side outcomes.

Source: Ministry of Rural Development, Provision of Urban Amenities in Rural Areas

4: Strengthen Decentralised Governance

These implementation measures are concerned with creating the enabling environment for drinking water security; this requires institutional support, financing and regulation/monitoring.

4.1 Institutional roles and responsibilities

Institutional roles and responsibilities laid down in the NRDWP Guidelines should be followed:

- **Gram Sabha:** The community talks about what it wants in the Gram Sabha and approves decisions about water services based on techno-economic criteria.
- **The GP** is responsible for ensuring that every person has access to an adequate supply of safe water.
- **Water Operators:** Contracts set out caretakers/operators tasks and what they will be paid.
- The **VWSC** should be a standing committee of the **GP** as per the Panchayat Raj Act/Rules and responsible for planning, implementation, operation, maintenance and management of the water supply system.
- GPs/VWSCs implement plans to agreed budgets and timeframes, and provide annual reports on progress and performance to the Gram Sabha and the Block Panchayat.
- The **Block Resource Centre** provides motivation, training, support etc. to the GP/VWSC.
- **District support:** ZPs and DWSMs help organize financing, training and technical support, review plans and monitor implementation and performance.
- In Union Territories and smaller States the full complement of BRCs and DWSMs and their staffing would not be required nor could it be funded from the Support funds. The UTs and smaller States can appropriately plan the staffing, remuneration and setting up of BRCs and DWSMs depending on the availability of funds and requirements.
- All States should have a dedicated line Department/ Board/ Corporation for rural water supply with dedicated Rural Water Supply engineers and other staff at district, block and section levels located within the PRIs or to support them.
- **State support:** SWSMs provide policy guidance; SLSSCs approve schemes and Support activities to be taken up and review implementation progress and operational performance; WSSOs deal with software aspects of RWS; State Technical Agencies (STAs) support PHEDs through technical expertise.

- The SWSM and DWSM are responsible for getting the GPs and VWSCs to participate in planning for improved drinking water security.
- **Awareness creation and IEC:** Awareness of all stakeholders on various aspects of ensuring drinking water security is very vital to achieving the overall sector objective. This involves not just communication of messages but also adequate behavior change. States should design and implement appropriate behavior change communications and monitor the progress on the change achieved periodically.
- Linkages with R&D institutions, national and State level scientific institutions and educational institutions at all levels will be strengthened through R&D projects, tie-ups for water quality monitoring, training, technical support, monitoring, evaluation, impact assessment studies etc.
- **Role of NGOs and CSOs** will continue in community mobilization, information dissemination, institution building, planning and technical support and monitoring. In addition they may also be involved in planning, designing and piloting of model innovative schemes by the States.
- **Department of Drinking Water Supply, Ministry of Rural Development** would be in charge of policy making at the national level, revising policy and guidelines from time to time, financial and technical support to the States, facilitating States to avail external assistance, macro-monitoring of sector performance, programme monitoring, advising and coordinating with other Ministries/Departments and their subordinate offices, institutions, autonomous bodies on matters relating to drinking water supply in rural areas and for coordination with urban water supply where required and other functions as laid down in the rules and by the competent authorities.

Convergence of different development programmes

- Regular meetings of the National Drinking Water and Sanitation Council should be held for better coordination and convergence at the national level.
- SWSMs are responsible for convergence of policy and programmes for water supply and sanitation with other related Departments and programmes at the State level.
- DWSMs are responsible for coordination of activities relating to water and sanitation among district officers of Health, Education, Forests, Agriculture, Rural Development, etc., and National programmes/grants such as TSC, SSA, NRHM, ICDS, BRGF, MNREGS, FC .
- The SWSMs and DWSMs should meet regularly. The issues for discussion listed in the SWSM and DWSM Guidelines for effective functioning of SWSMs and DWSMs indicate many activities and areas of convergent action. These should be discussed, followed and built upon.
- Convergence with Health and Women and Child Development Departments to spread the message of safe water use, safe sanitation and hygiene has to be ensured by SWSMs and DWSMs.

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- A concurrent monitoring system for water borne diseases and health should be set up for clinical assessment for arsenical dermatitis and fluorosis and regular monitoring done for other water borne diseases especially diarrhea through the community health monitoring approach.
- Capacity building should be provided to Medical Officers on detection of arsenic and fluoride poisoning cases and other water borne diseases and their management in the affected GPs/blocks.

4.2 Financing of drinking water security

- Funds would be allocated according to NRDWP Guidelines, including allocations for Sustainability, Water Quality and O&M.
- GPs/VWSCs should have an annual workplan with activities, budget and timeframe/milestones.
- Funds should be devolved to GPs from DWSMs to implement their village water security plans/annual workplan, with DWSMs reviewing operational and financial viability of plans and monitoring whether planned activities are on schedule and to budget.
- States should ensure clarity on O&M policy, including subsidies and tariffs, so that VWSCs and operators can estimate their revenues and plan accordingly.
- Incentive schemes should be introduced to reward good performance by GPs/VWSCs and BRCs.
- An incentive award 'Sajal Gram Puraskar' will be instituted to encourage Panchayats that provide safe and adequate drinking water supply to all households on a convenient and sustainable basis.
- Various indicators will be used for measuring devolution of functions, funds and functionaries (3Fs) by States to PRIs. A Management Devolution Index based on these indicators will be used to allocate the 10% incentive under NRDWP for States where PRIs manage RWSS. This will encourage States to devolve the 3Fs to the PRIs.

4.3 Regulation

Transparency of information is a critical first step towards effective regulation. States should provide access to information through online reporting mechanisms with information placed in the public domain to bring in transparency and informed decision making¹².

States are required to establish a regulatory body as a condition of the 13th Finance Commission. However, many interim steps can be taken to establish sound regulatory functions.

Water resources regulation¹³

¹² A good example is the Madhya Pradesh State Planning Commission web portal for integrated district planning carried out in five pilot districts under the Planning Commission - UNDP Joint Programme on Convergence.

¹³ Adopted from Key Provisions of the Maharashtra Water Resources Act of 2005, based on MWRRRA (2005).

- States should ensure mainstreaming of drinking water sector concerns in water regulation.

Water resources regulation should:

- Put in place systems for measuring availability of water through monitoring groundwater levels and rainfall in every village and GPs.
- Calculate existing usage of water by various categories of users.
- Determine the equitable allocation and distribution of water within each category of use (irrigation water supply, rural water supply, municipal water supply or industrial water supply).
- Determine the priority of equitable distribution of water available, and adjustment of allocations during droughts.
- Establish a water tariff system for bulk supply, and fix the criteria for water charges.
- Keep in mind inter-state water resources apportionment on river systems.
- Improve water use efficiency over existing levels.

Economic regulation (setting, monitoring and enforcing tariffs and service standards for water service providers)

- States must establish O&M policy on service standards and user charges with appropriate subsidies and protecting the supply of basic needs without any financial constraints.
- The GP and VWSC should support a process of social audit by placing key issues for discussion and decisions in the Gram Sabha, including selection of sources and systems, community contributions, user fee charges and connection fees, and subsidies/concessions provided to ST, SC and BPL households.
- DDWS, SWSM, DWSMs, VWSCs and operators should have mechanisms in place for client/consumer grievance redressal.

Value for money

- E-procurement should be introduced for rural water supply schemes in all States.
- States and districts should adopt computerised inventory management in all offices.
- Third party or Departmental Quality Control Laboratories for testing materials used in RWSS should be set up at State and/or regional levels by all States and strengthened.
- Engineers will be trained in efficient design of new schemes and in rehabilitation and restoration of old schemes to ensure value for investments.

Environmental regulation (regulating water abstractions and discharges back to the environment so as to manage resources in a sustainable manner)

- States should enact water resource legislation to regulate abstraction of ground and surface water.

- GPs should be empowered to address the issue of controlling irrigation and industrial demand within their boundaries to secure their own drinking water supply.
- Larger schemes and works such as storage tanks require attention to environmental and social impacts.

Public health (water quality) regulation (setting standards and monitoring drinking water quality)

- The DDWS and States should notify and enforce drinking water quality standards in a phased manner in line with IS 10500 and NRDWP guidelines.
- The Uniform Protocol for Water Quality Monitoring Order (2005) should be followed in all labs.
- States should obtain assistance of agencies like CPCB, SPCBs, CGWB, State Ground Water Boards/Departments, NIH, scientific and educational institutions with established water quality testing facilities for training and technical assistance.
- Impact assessment studies of water quality on health and environment should be done regularly.

Monitoring, audit and reporting

- In monitoring coverage, focus should move from achieving habitation level coverage towards household level drinking water coverage. Habitations with uncovered households cannot be considered fully covered.
- IMIS with GIS mapping will be improved for transparency, effective monitoring, and reporting on preparation, implementation and performance of drinking water schemes.
- Workwise monitoring from estimate to payment will be integrated in the IMIS to link the physical and financial reporting systems.
- All drinking water sources, storage structures and delivery systems will be mapped using GPS on GIS.
- **Social audits** should be mandated by States. The existing Mahatma Gandhi National Rural Employment Scheme (MNREGS) model can be replicated for rural water. Detailed guidance will be provided by DDWS on conducting social audits. Training programmes will be conducted for this purpose.
- Overtime a process of benchmarking performance can be adopted (see Box below).
- Conduct annual / biennial independent verification and monitoring survey and beneficiary assessments to verify coverage, service levels, satisfaction etc.

There are two forms of "benchmarking" performance, metric and process, which WSSOs/DWSMs should take up and establish over time.

- Process benchmarking involves identifying and learning from 'best in class', i.e., GPs/VWSCs can learn from other GPs/VWSCs that are doing well. The approach is to find out which GP/VWSC is currently the best at some aspect of planning or operations. For that particular aspect, the other GPs/VWSCs can then learn how to

perform at a level comparable with the best. If this learning process can be established not as a competition, but as experience sharing, there can be great enthusiasm to take part in the workshops and to work together to the benefit of all. This can be a part of existing training/refresher training programmes.

- Metric benchmarking aims to establish league tables of performance to stimulate GPs/VWSCs to improve performance. It is important to start in a simple way with a few key performance measures, obtain sound baseline data, and initially concentrate on looking at performance trends for each GP/VWSC. Each GP/VWSC should be aiming to improve on its own performance year by year. This can be a part of the existing annual reporting process, where year by year operational performance can be compared.

States can begin by identifying the critical aspects for process benchmarking. Workshops can be held to develop the approach for learning from best in class in a State. At the same time a few critical parameters could be chosen for making a start on metric benchmarking, for which simple league tables can be established and linked to national or state incentive reward schemes. Training of the benchmarking facilitators (DWSMs and others) is critical for success.

5: Build Professional Capacity

5.1 Training

- Training should be based on Training Needs Assessment on all identified issues and specifically targeted to new institutional roles and responsibilities to support village, district and State water security planning and implementation
- National Key Resource Centres, SIRDs and other training institutions should establish training modules and programmes on all issues related to drinking water supply including for village and district water security planning and implementation for BRC and DWSM staff.
- Polytechnics and industrial training institutes and vocational education institutions should offer courses to develop practical skills for rural water supply.
- WSSOs (CCDUs) should operate a Help Desk and Outreach Training Programme.
- Pilot demonstrations at GP or Block level to provide an opportunity for 'learning by doing' should complement class room sessions.
- Technology parks can be established to showcase cost effective technologies.¹⁴
- State workshops should be held with participation of practitioners to share case studies of good practice.
- Exposure visits for key stakeholders are the best way to facilitate peer to peer learning from cases of good practice.
- Written documentation and short films on success stories should be used to help disseminate lessons learned.
- PHED engineers should have the opportunity to learn new skills so that they are better able to offer technical support to local governments and communities.

¹⁴ Such as the rural technology park and mela at NIRD, Hyderabad.

Staff (institutions) should be results orientated, people focused, effective and efficient in resource utilisation, and able to deal with unknowns.

- **Change management** training programmes will be imparted in all States to re-orient roles of engineers towards greater participatory planning and implementation and provide better value for money.

5.2 Technical support

Formatted: Justified

- The Public Health Engineering/Rural Water Supply Departments/Boards/Corporations are the key to successful implementation of the Strategy. The expertise and experience available with them should not be lost or duplicated while outsourcing any activity.
- PHED engineers are a key resource for engineering designs, cost estimates and troubleshooting technical problems. Therefore, professional capacity building of water supply engineers in knowledge, skills and attitudes should be taken up through STAs, National and State KRCs, regular training programmes in reputed institutions both within the country and abroad, and through online and distance education courses.
- Posts of field level engineers have to be filled regularly. States should plan recruitments by manpower planning and ensure that not more than 5% vacancies exist in the district, block and sub-block level cutting-edge technical posts.
- DWSMs and BRCs should be set up and staffed depending on the availability of funds and requirement in each State/UT.
- Key Resource Centres at State and district level can be identified and tasked with providing technical and managerial support.
- Services of qualified hydrogeologists should be made available to support PHED, DWSM, VWSCs in all districts.
- Groundwater survey and development, hydrology, geology, geomorphology will be integrated in the RWSS Departments of States on the **GSDA model** of Maharashtra.

5.3 Outsourcing

- Public private partnerships allow States to retain regulatory and supervisory responsibilities while accessing skilled operators and service providers of the private sector.
- The private sector may offer management expertise, tariff and financial discipline, and private capital.
- Service Agreements (whether with community based, public or private operators) should be in place since they bring transparency to service deliverables and how the operator will be paid.
- Service agreements also help to orientate inexperienced operators in gathering information, planning, routine operations, efficiency improvements and expansion.
- While formulating State specific PPP policy the PURA scheme Guidelines and documents prepared under it may be considered for guidance.
- States should develop and disseminate appropriate knowledge and tools to prepare, tender and manage service agreements with community based, public or private handpump mechanics, contractors, piped water supply operators and other service providers.

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Part Five: Learning Agenda, Resources Required and Key Performance Indicators

Learning agenda for the Department of Drinking Water and Sanitation

Training and technical support has been presented in Part Four. The implementation of a learning agenda is built upon the following strategies, which are led by DDWS:

- Laying down national policy framework in the NRDWP Guidelines
- Bringing out Handbooks/ Manuals for guidance of PHEDs and PRIs.
- A national pilot in [ten] blocks in different States to demonstrate drinking water security planning and implementation.
- Development and provision of training modules and materials by National Key Resource Centres and NIRDS.
- Sharing field experiences from good practices/ case studies in India and internationally in surface water management, ground water management, water safety planning, etc.
- Setting up and strengthening the National Resource Centre to provide technical and knowledge support to DDWS.
- Arranging trainings and exposure visits within and outside the country for senior officers of RWSS in States and staff of DDWS.

Resources required by DDWS

Manpower resources – The National Resource Centre consultants will be utilised to strengthen the Departments policy making and guidance roles. The NRC will be strengthened to become an autonomous institution on the lines of National Rural Roads Development Authority.

All Technical Advisors posts in the DDWS will be filled up and suitable cadre management adopted to attract good talent.

Financial resources can be classified according to NRDWP funding components for the period 2010-2022.

(To be worked out)

| Component | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 | Total |
|-------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------|
| Coverage & Water quality | | | | | | | | | | | | |
| O&M | | | | | | | | | | | | |
| Sustainability | | | | | | | | | | | | |
| Support | | | | | | | | | | | | |
| Natural calamity | | | | | | | | | | | | |
| TOTAL | | | | | | | | | | | | |

Total 2011-12

Total 2012-17 -

Total 2017-22

Key Performance Indicators

| Level | Description | Key Indicators | Means of Verification |
|--------------------|--|--|--|
| Impact | Household health and livelihoods improved | - % Reduction in prevalence of diarrhea in children under 5 from base year - % Reduction in IMR from base year | Data from MoHFW |
| Outcomes (Results) | Every rural person has enough safe water for drinking, cooking and other domestic needs as well as livestock at all times in all situations. | -% of households accessing drinking water through piped water supply with household connections (i)metered and (ii) unmetered. -% of households accessing drinking water through public taps -% of households access drinking water supply through handpumps throughout the year. -% of households accessing drinking water through other means throughout the year -% of habitations with service level of 70 lpcd or more -% drinking water sources with safe drinking water as per IS 10500 norms throughout the year. -% age of public drinking water sources with chemical contamination -%age of private drinking water sources with chemical contamination -%age of public drinking water sources with bacteriological contamination -% households accessing safe drinking water as per IS 10500 norms throughout the year. -% of villages with 24x7 safe water supply throughout the year -% of village schools with water supply -% of anganwadis with water supply | IMIS – Monthly report IMIS-Annual Report -do- -do- -do- Based on sources tested in IMIS -do- IMIS-Annual Report -do- -do- |
| Outputs | Physical infrastructure created to support drinking water security for rural households. | -No of habitations covered by single village piped RWS schemes -No of habitations covered by multi-village piped RWS schemes -No of rainwater harvesting structures created -No of groundwater recharge measures implemented - No. of quality affected habitations covered % of districts with district level labs -% of sub-districts with sub-district level labs -% of all drinking water sources tested during the year | All through IMIS-Annual and Monthly reports |

| Strategic objectives | | | |
|----------------------|---|---|--|
| 1 | Drinking water security plans developed and implemented | <ul style="list-style-type: none"> -% age of GPs/VWSCs managing in-village water supply -% age of single-village/in-village water supply schemes implemented by GPs/VWSCs -No. of village drinking water security plans developed -No of village drinking water security plans implemented -No. of district drinking water security plans developed -No of district drinking water security plans implemented | All through IMIS – Annual Report |
| 2 | Conjunctive use of water sources adopted | <ul style="list-style-type: none"> -% of villages served only from groundwater sources -% of villages served only from surface water sources -% of villages served only from rooftop water harvesting -% of villages using recycled water -% of villages served from surface and ground water sources, -% of villages served from surface, ground water and rooftop water. | All through IMIS - Reports |
| 3 | Convergence of various programmes | <ul style="list-style-type: none"> - Number of drinking water supply schemes using funds from programs other than NRDWP -No. of districts reporting on funds used through convergence | Through IMIS Reports |
| 4 | Institutional arrangements strengthened | <ul style="list-style-type: none"> -No of states that have carried out an activity mapping exercise for PRIs -No. of states transferring capital and O&M finances to PRIs. - Management Devolution Index of States to measure nature and extent of management of RWSS by PRIs. | Through reports from State Governments |
| 5 | Financing of plans adopted | <ul style="list-style-type: none"> - % of GPs with a corpus fund for replacement and expansion. - % of GPs with more than 75% of demand of user charges collected | IMIS - Reports |
| 6 | Regulatory processes adopted | <ul style="list-style-type: none"> -No. of states adopting regulatory legislation to prioritise allocations for drinking water. -No of states institutionalizing regulatory bodies. -No. states with an O&M policy on service standards and cost recovery. -No. of states adopting Uniform Protocol for Water quality testing. -No. of DWSMs meeting twice in previous year -% of GPs reporting monitoring of drinking water quality -% of groundwater sources for which | <p>As per State Govt. reports</p> <p>-IMIS Reports</p> |

| | | | |
|---|---|---|--|
| | | groundwater levels are reported. -% of Unaccounted for Water in rural multi-village piped water supply schemes | |
| 7 | Training of all key stakeholders undertaken | -No. of training workshops completed at different levels -No. of trained people at different levels -No of exposure trips and no of participants | |
| 8 | Technical support strengthened | -% of BRCs set up % of BRC Coordinator positions filled -% of DWSM and SWSM support staff positions filled % of district, block and sub-block level engineer posts filled up -No. of State and district Key Resource Centres established -No. of activities undertaken by STA -No. of activities undertaken by State Referral Institute | |
| 9 | Outsourcing | -No. of PPP contracts in rural water supply | |