How to ensure sustainability of water and sanitation services

Answer lies in integrated planning for Sustainable Development Goal 6

IRC akvo.org nidan Wetlands INTERNATIONAL

*

How to ensure sustainability of water and sanitation services

Answer lies in integrated planning for Sustainable Development Goal 6

As populations and demands on water resources continue to grow, India stares at a historic water crisis that threatens around 600 million people in the country. The situation is getting acute as more areas run out of groundwater. India's per capita renewable internal freshwater resources stand at 1118 m3, which is very close to water scarcity levels. The changes in water availability is adversely impacting water supply and sanitation (WASH) services. Hand pumps and taps go dry, toilets get constructed but are not used as there is no water. A NITI Aayog report released in June 2018, says that the demand for potable water is likely to outstrip supplies by 2030, if mitigation steps are not taken. Climate change is altering water availability adding to the water woes. The success of water and sanitation schemes will depend on the degree to which water security concerns are addressed and integrated within WASH and water resource plans and programmes.

Leaving no one behind – Creating spaces for women to engage is essential for inclusive WASH planning

The path to sustainable water and sanitation

India is signatory to Agenda 2030 for Sustainable Development, that aims to end poverty and promote prosperity for all. The 'Sustainable Development Goal (SDG) 6 - Water and sanitation for all' is a key sustainable development goal. National programmes as Swachh Bharat Mission and National Rural Drinking Water Programme, have laid down the pathways to achieve the SDG 6 targets related to universal and equitable access to drinking water and sanitation.

SDG 6 however, is one integrated package of WASH[1] and water resource management targets which are interconnected and complementary to each other. In order to realize SDG 6 as a goal, elements like freshwater availability, water quality, water use, ecosystem health and functioning which are invariably linked in one large system, need to be considered together from a Water Resource Management perspective.

While we have made the right beginning, in order to make it right in the end, we need to move beyond infrastructure provisioning, and place WASH service delivery in the wider context of water security and look for integrated solutions that will sustain WASH services in the long run.

The SDG 6 elements converge together at local scales and the benefits of such convergence can be demonstrated and achieved through the involvement of the concerned decision makers and stakeholders. The 'Watershed India' programme aims to capture evidences of such interlinkages to influence policy and programming within WASH and water resources sectors to adopt an integrated approach.

The purpose of this briefing paper is to highlight as to 'why adopting such an integrated approach is critical in the context of growing water stress' as viewed in the pilot location of Watershed India in Samastipur, Bihar so as to build a case for establishing a scientific basis for integrated water security planning at local and basin scales.

SDG 6: Ensure availability and sustainable management of water and sanitation for all

6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all

6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations

6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally

6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity

6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate

6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes

6.a By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies

6.b Support and strengthen the participation of local communities in improving water and sanitation management

[1] Water, Sanitation and Hygiene Services

How water security affects WASH sustainability?

Bihar State faces twin problems of recurring droughts and frequent floods. The general perception about Bihar is that of being, India's most flood affected State, with 73% of its geographical area getting annually inundated by floods. However, this is only one part of the story. Rainfall has become erratic and unpredictable and the seasonal flooding is followed by prolonged water scarcity and droughts in the summers. Climate change combined with unwise management of natural resources has compounded the problem. In 2013, Bihar faced 25% rainfall deficit where it received 668 mm rainfall against annual rainfall average of 892 mm. 33 out of 38 districts were declared drought hit including Samastipur[2]. In 2018 as well, the state faced a drought threat as there was significant rainfall deficit in the first half of the monsoons.

Seasonal fluctuation in water regimes adversely impacts water and sanitation service delivery. Samastipur District is traversed by the Burhi Gandak, the Baya, the Kosi, the Kamla, the Kareh, the Jamwari and the Balan Rivers. Ironically, Samastipur District also ranks as the fifth most drought prone district of Bihar and has witnessed nine drought years from 1966 - 2010. The region is underlain by multilayer alluvial aquifers. However during summers, water level in the tubewells goes down rendering many of them dysfunctional.

As part of Watershed India, participatory surveys were conducted from August 2017 to October 2017 in ten villages, falling under Ujiarpur and Sariaranjan blocks of Samastipur, situated around Debkhal Chaur. 1035 waterpoints[3] and 406 households were surveyed to assess WASH and water resource situation.

Few key results of the surveys:

- While communities have the desired access to water points, water quantity and quality and reliability are major issues. 45 % public water points and 51% private water points yielded no or limited quantities of water providing 0-40 litres of water per capita per day[4].
- 57 % households faced water scarcity in summers for a period of over two months.

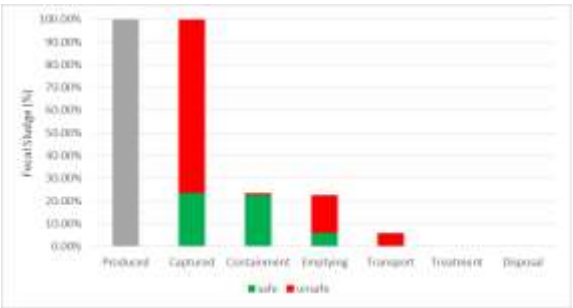


Figure 1. Sanitation service delivery levels

[2] Down to Earth article published on 4th July, 2015, *33 districts in Bihar declared drought hit*.

[3] The waterpoint data includes those that are being used for drinking water and includes protected and unprotected dugwells, Mark II Handpumps, non-specific handpumps, public standposts, household taps, Tara pump and PHE 6 handpumps.

[3] Draft guidelines for preparing Village Water Security Plan issued under NRDWP, by the Department of Drinking Water Supply, MoRD, 2010.

[4] The limited service level for water quantity taken here is 40 lpcd (litres per capita per day).

The issues faced were drying up of water source, low water yield and more time involved in collecting water to water quality getting degraded.

- Water quality testing revealed the presence of Coliform in 41 % of 498 water samples.
- Half of the water points had Iron way beyond permissible limits of 0.3 mg/l.
- Diarrhea incidences in the past one year were reported from 45 % households.
- Only 23.3 % of the faecal sludge generated in the pilot landscape is contained safely, rest 57 million litres/annum of faecal sludge ends up contaminating the environment. Since there is no safe method of transportation and treatment, none of the matter which was contained safely is either transported or disposed safely.
- Manual pit cleaning is still practiced and pit cleaning was done manually for 37 % toilets.
- Drainage systems for solid and liquid waste management are almost nonexistent. Wherever present there is no proper maintenance.

Possible reasons and key challenges

The reasons for inadequate functioning of WASH infrastructure is embedded in an analysis of the water regimes of the landscape.

Shrinkage of surface water and groundwater regimes. A temporal analysis of water bodies and inundation patterns using satellite images of 1987 and 2016 reveals that the "sponge capacity" of the system to store water through wetlands as chaur, maun, village ponds and tanks has declined and this has definite implications for water availability for human needs, for ecosystems and possibly for groundwater recharge in a major way. There has been significant decline in open water, marshes and intermittently flooded areas.

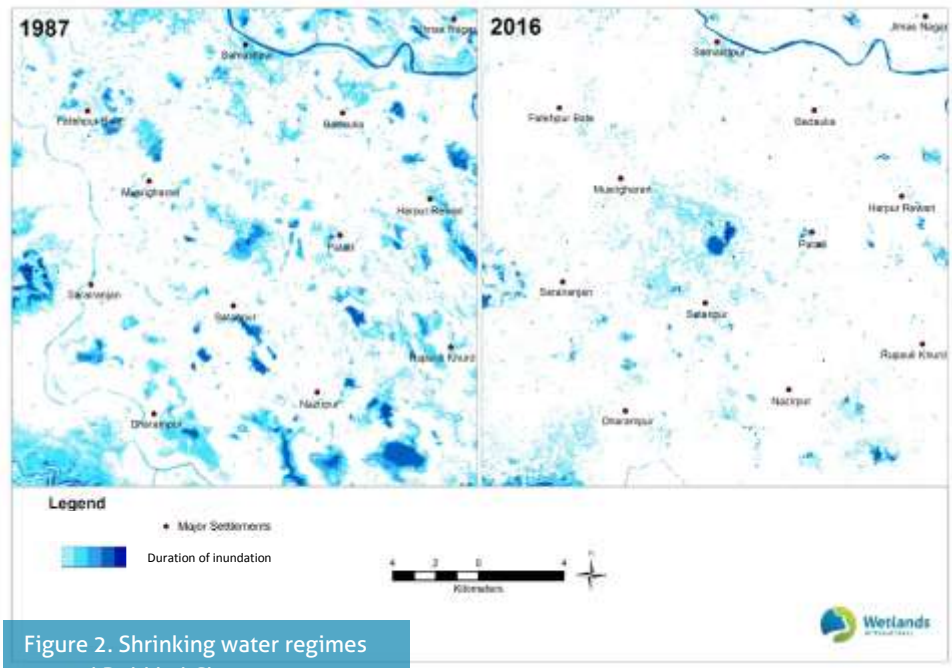


Figure 2. Shrinking water regimes around Debkhal Chaur

Similarly, an analysis of hundred year annual rainfall data shows a marked declining trend particularly since the late 1990s in the district.

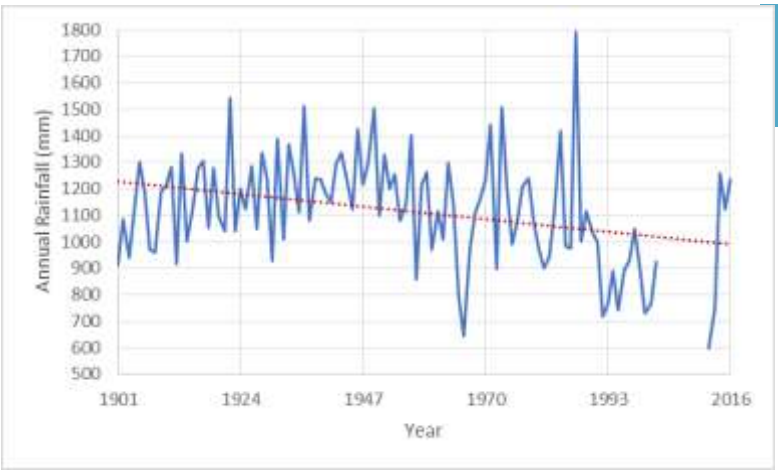


Figure 3. Rainfall trends for Samastipur District - 1901 to 2016

Loss of river and floodplain connectivity. The management of water resources in the state has largely been from a flood mitigation and irrigation centric perspective without giving much attention to maintain the lateral continuum of surface water flows. The wetlands and floodplains have become isolated from the rivers by embankment and encroachments on flow channels. The connectivity with adjoining waterbodies has also been lost. Excess water which otherwise used to flow from rivers and get stored in ponds, chaurs, mauns during monsoons and was available for communities through the year now remains confined within river channels increasing the intensity of floods.

Increased dependence of the farming communities on groundwater. With the advent of irrigated agriculture which picked up pace in the 1980s, groundwater drafts using tubewells has spiralled up throughout the region. The gross area under tubewell irrigation has increased from 1,12,809 ha in 2006-07 to 1,69,480 ha in 2009-10 in Samastipur, showing a fifty percent increase[5]. The agricultural activities relying on excessive groundwater abstractions strains an already stressed water environment and puts at risk the availability of water for other uses including WASH services.

Motors are installed 3-4m below ground to draw water from irrigation borewells

Results indicate that the progress to universal access to safe and affordable drinking water and sanitation is seriously constrained by a rapidly deteriorating water situation. The focus on a supply

[5] Government of Bihar (2011), *Bihar through Figures – 2011*, Directorate of Economics and Statistics, Government of Bihar, Patna, Bihar

driven creation of water and sanitation infrastructure has led to regular slippage and poor WASH service levels as no or limited planning and investments are made to achieve the other SDG 6 targets related to water resource management. Besides, information asymmetry and lack of community capacities to understand, assess and address their water security concerns hampers true progress towards realizing SDG 6 goals.

Recent thinking and experiences

Water problems are many and the solutions are not easy. More commonly they are symptomatic of a deeper failure of water management systems pointing to the need of a long term planning with an agenda for sustainable use.

The sustainable management and development of water resources involves moving from centralized decision making processes and sectoral planning towards cooperation and concerted action by society, sharing of results and opportunities, transparent dialogue and integrated planning for water resources.

The growing disquiets over water insecurity in the region underpin the importance of a meaningful assessment of resource availability and ensuring its wise use. Source sustainability themes are highlighted within the National Rural Drinking Water Programme guidelines which prescribes the formation of Village Water Security Plans[6]. These plans can be invaluable tools in the hands of local communities to budget their water use based on local water availability.

Dug wells are also used as a source of domestic water

Recommendations and next steps

- **Recognizing the role of healthy ecosystems**

WASH sustainability and water security concerns are better addressed by making optimal use of available water resources, both surface and groundwater. Management and restoration of wetlands with an optimal use of surface water will reduce dependency on groundwater for irrigation as well as for other uses. Several studies suggest that investing in ecosystem management creates multiple benefits as it may help to reduce impact of floods and climate change.

- **Promoting water security planning as a means of effectively allocating water for various ecological and human uses including water for WASH**

Village and basin level planning based on water budgeting is a key factor in ensuring optimal utilization of water and mapping specific interventions such as catchment conservation measures, for realigning land and water use practices with water security. To make the water security plans scientific and rounded, it is critical to bring in elements of water management such as planning based on hydrological boundaries, giving an emphasis to holistic planning covering overall water demand including agriculture and industrial usage and assessing the water supply scenario based on geo-hydrological considerations, aquifer characteristics, recharge and discharge rates and zones.

- **Establishing community-led system of water regime monitoring and assessment**

It is important to build community capacities to realize the potential of water management. Training of identified champions at the community level on simple monitoring of groundwater levels, testing of water quality and water budgeting based on demand supply scenario will not only provide a scientific basis for water security planning but also improve accountability of existing systems and facilitate democratic planning and decision making.

- **Establishing institutional mechanisms for cross sectoral engagement on a regular basis**

Government entities dealing with various SDG 6 aspects and also with issues like rural development, climate change adaptation and Disaster Risk Reduction need to cooperate more closely on a regular basis. This should include sufficient measures that allow for vertical integration between various governance levels and also participatory approaches towards community and CSO involvement.

Increasing knowledge on integrated water management is key to address WASH issues

Watershed India

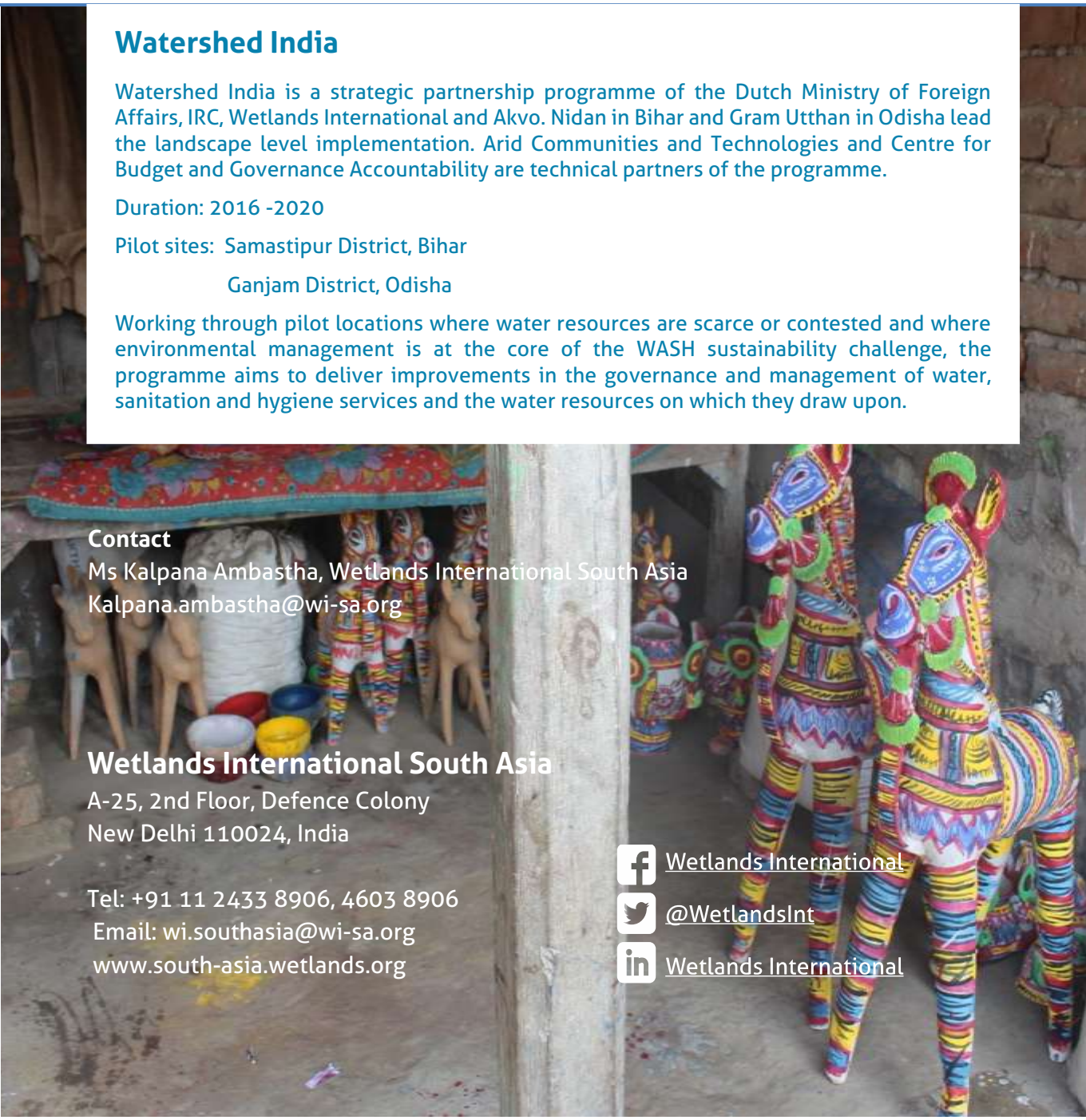
Watershed India is a strategic partnership programme of the Dutch Ministry of Foreign Affairs, IRC, Wetlands International and Akvo. Nidan in Bihar and Gram Utthan in Odisha lead the landscape level implementation. Arid Communities and Technologies and Centre for Budget and Governance Accountability are technical partners of the programme.

Duration: 2016 -2020

Pilot sites: Samastipur District, Bihar

Ganjam District, Odisha

Working through pilot locations where water resources are scarce or contested and where environmental management is at the core of the WASH sustainability challenge, the programme aims to deliver improvements in the governance and management of water, sanitation and hygiene services and the water resources on which they draw upon.



Contact
Ms Kalpana Ambastha, Wetlands International South Asia
Kalpana.ambastha@wi-sa.org

Wetlands International South Asia
A-25, 2nd Floor, Defence Colony
New Delhi 110024, India

Tel: +91 11 2433 8906, 4603 8906
Email: wi.southasia@wi-sa.org
www.south-asia.wetlands.org

Wetlands International
@WetlandsInt
Wetlands International

Wetlands INTERNATIONAL