

## Adaptation of WASH services delivery to climate change, and other sources of risk and uncertainty

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### Introduction and overview

Climate change has the potential to impact on both the supply and demand sides of WASH delivery systems. Some potential impacts are likely to be direct and very obvious (e.g. increased incidence of extreme floods that damage WASH infrastructure), whereas others are likely to be indirect, insidious and more uncertain in nature and severity (e.g. sea level rise leading to migration away from coastal areas). These impacts happen often in a context where many other factors of uncertainty and faster and slower changes are underway, such as increased competition between WASH services and agriculture, or demographic changes.

This briefing note is targeted at WASH professionals and practitioners who recognise the need for climate change adaptation but are not sure what to do or how to plan for this and may already be struggling with major challenges of improving or maintaining current WASH services. More specifically this briefing note recommends that WASH practitioners use a range of practical and well-proven methods and tools for dealing with uncertainty, which is not necessarily caused by climate change, to identify and prioritise viable adaptation strategies. These methods and tools are described below.

The approach recommended here is based on three principles all of which are consistent with statements that were prepared for COP15<sup>1</sup>:

- WASH sector professionals should treat climate change as one of many sources of risk and uncertainty. A consequence of adopting this principle is that climate change is ranked or prioritised against other sources of risk and uncertainty during relevant WASH intervention processes;
- There will not be a unique strategy for adapting to climate change. In every case, consideration should be given to the socio-political and bio-physical setting, and the various sources of uncertainty;
- Effective adaptation to climate change will, in almost every case, require improvements in WASH governance in general, particularly strengthened planning processes.

#### Box 1. Common climate change myths

**No regrets, low regrets actions are relatively easy to identify.** Particularly in areas of water scarcity, these actions need detailed planning and assessment, as most “no regrets, low regrets” actions have significant negative tradeoffs and externalities, and often high costs.

**There are “one size fits all” adaptation strategies.** When account is taken of tradeoffs and externalities, an adaptation strategy that might be excellent in one context could be disastrous in another setting.

**Inadequate scientific understanding is the main source of climate change uncertainty.** There is increasing recognition that uncertainty linked to climate science is relatively small compared to uncertainty linked to the wider political economy of climate change adaptation.

**Climate change is by far the biggest threat facing water management.** Clearly climate change represents a huge threat and challenge for water management, but there are many others including: demographic changes, water scarcity, war and economic developments.

<sup>1</sup> The Nairobi Statement <http://www.landwaterdialogue.um.dk/> and Stockholm Statement

This list of adaptation principles is echoed by other water-using sectors (e.g. agriculture) as well as in broader overview documents<sup>2</sup>, and, as such, principles listed above are hardly new. Some would even argue that they just represent “business as usual – but better”.

### Current response of the WASH sector

Whilst climate change has been hitting the headlines in the media and at international meetings, throughout the world it is “business as usual” for most WASH sector professionals and practitioners. Why does this disconnect exist? Possible answers include:

- **Too many current challenges to worry about the future:** Many WASH sector professionals and practitioners are busy meeting more immediate challenges of improving WASH services provision from currently low levels
- **Climate change is regarded as somebody else’s problem,** as in many countries, the remit for climate change adaptation has been allocated to a specific department or ministry
- **Lack of political will.** There is a tendency for politicians (and even WASH professionals) to be very quick to blame problems in WASH services delivery on climate change, often with no justification, as a convenient scapegoat.
- **No time for new responsibilities.** WASH professionals and practitioners are often faced by many challenges, and, they just do not have the time to take on new responsibilities that might lead to delays in meeting their immediate targets. This is especially true for an issue that may seem so big, overwhelming and surely beyond one’s control.

- **Wait and see.** Finally, a large proportion of WASH practitioners and professionals are in what could be described as a “wait and see” mode. Put another way, whilst they are not in denial of the potential risks posed by climate change, they do not recognise the imperatives for taking immediate actions or modifying existing procedures, often until there is clear guidance in the sector on what climate change adaptation could look like.

In response to these various attitudes, this briefing note aims to provide a practical approach for starting to manage risk and uncertainty.

### Overview of practical approach for managing risk and uncertainty

There are three main components to the approach:

1. **Identifying WASH governance issues for potential ‘hot spots’:** Certain areas are more prone to climate change impacts than others, although impacts have also been felt in other areas. WASH governance needs to be specially strengthened to ensure adequate service delivery in these areas.
2. **Visioning and scenario building:** Identify the potential impact of extreme events (e.g., cloudbursts and flash floods, sea-level rise, prolonged drought) and, for each scenario, draw up mitigation plans and strategies at all levels, to minimize loss of lives, livelihoods and infrastructure
3. **Preparing and implementing plans:** Translate plans and strategies into government policies and programmes, by raising awareness of politicians and policy makers at all levels. Also, work at community level to prepare them to respond appropriately to each scenario.

Each of these is discussed in more detail below.

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<sup>2</sup> e.g. WWC/CPWC/IUCN/IWA, 2009  
[http://worldwatercouncil.org/fileadmin/wwc/Library/Publications\\_and\\_reports/Towards\\_a\\_Framework\\_for\\_Climate-Proofing.pdf](http://worldwatercouncil.org/fileadmin/wwc/Library/Publications_and_reports/Towards_a_Framework_for_Climate-Proofing.pdf)

## 1. Identifying WASH governance issues for potential hot-spots

The main areas vulnerable to climate change risks have been well-identified and documented at a global level (e.g. the Bali Action Plan, UNFCCC, 2007). But these need to be expanded to include potential hot-spots: areas where extreme events like floods or droughts have not occurred in recorded history, but have begun to appear (e.g. floods in the Indian desert state of Rajasthan in June 2010). Also, these areas need special attention in country-level WASH governance, to ensure sustained WASH service delivery in these vulnerable areas.

Improvements in WASH governance are fundamental to meeting both existing and future WASH challenges, irrespective of climate change. But there are certain additional water governance challenges linked specifically to climate change, including the following:

- **Risks from high-impact low probability events:** Many outcomes and impacts of climate change are unpredictable and potentially ‘black swan’<sup>3</sup> events that are extremely unlikely but, if they should occur, will have a high-impact.
- **Coping strategies may fail:** Many traditional coping strategies may be overwhelmed by the direct or indirect impacts of climate change;
- **Norms may be different:** Accepted norms and expectations in terms of water services delivery or disaster relief may have to be modified as a result of climate change;
- **New capacities and attitudes have to be built:** Mainstreaming climate change into planning processes requires specific capacity building and change management at all institutional levels, but particularly at decentralised level;

<sup>3</sup> For more information on the importance and nature of ‘black swan’ events see <http://www.fooledbyrandomness.com>

- **Public funding flows will need to be changed:** Increasing resilience to climate change requires change in the ways funds are allocated and used.

## 2. Visioning and scenario-building

For each of these vulnerable areas, visioning and scenario building exercises have to be done. The basic idea is to envision the worst possible scenarios (e.g., cloudbursts, consecutive years of droughts) and prepare strategies to deal with them (Box 2 and Figure 1).<sup>4</sup>

### Box 2. Examples of methods & tools for identifying, prioritising and managing risk and uncertainty

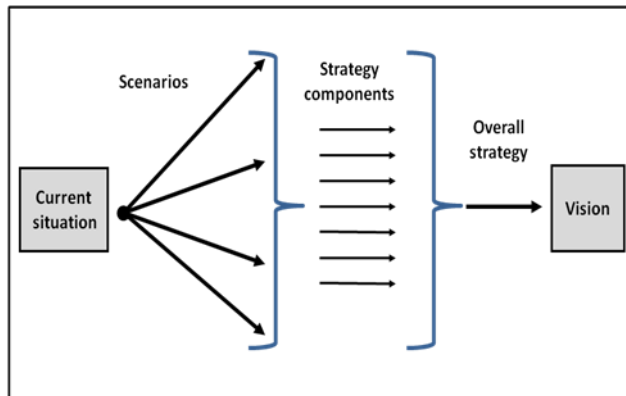
Vulnerability and risk assessment of WASH delivery systems is used to identify potential “hot spots” or failure points in time and space and/or in relation to different components of WASH delivery system. Vulnerability assessments also identify components of delivery systems that have already exhibited a high-level of resilience to extreme events or incremental change because this provides insights into how best to improve the resilience of the more vulnerable components

Scenario building is key tool for identifying, prioritising and managing risk and uncertainty and providing a basis for assessing the robustness of strategies to threats that although improbable could have a very big impact on WASH delivery systems.

At its simplest, this process involves three phases. First, develop a vision of the water services and environment to be achieved in the future. Second, develop a set of plausible

<sup>4</sup> The Shell Oil Company is reputed to have pioneered the use of scenario-building. Shell-type scenarios are used to explore the future and taking explicit account of a wide range of sources of risk and uncertainty (see [http://www-static.shell.com/static/public/downloads/brochures/corporate\\_pkg/scenarios/explorers\\_guide.pdf](http://www-static.shell.com/static/public/downloads/brochures/corporate_pkg/scenarios/explorers_guide.pdf)). These scenarios are different to scenarios those are used widely by scientists and modellers. In the latter case, the term scenario to describe a complete and coherent set of parameters or variables.

(although not necessarily equally likely) scenarios that describe different futures, using vulnerability and risk assessments to provide quantitative estimates of likely damage.



**Figure 1. Strategy development from scenarios**

Third, develop strategies to achieve the shared vision regardless of which scenario turns out to be closest to reality. Such an overall strategy may be simple or very complicated depending on the context and the time horizon of the vision.

While a scenario-building process should not ignore lessons learnt from early projects and programmes, it is important that stakeholders recognise that the future rarely resembles the past. Adaptation to change is feasible if the changes processes are slow and predictable (i.e. based on current trends or frequencies of occurrence). Problems really start to kick in when change is rapid and unpredictable. This is when scenario building shows its real worth to a strategy development and/or planning process.

When done with decision-makers responsible for WASH services, scenario building helps these stakeholders think creatively about important and uncertain factors over which they have very limited control. A well-facilitated exercise will make participants less likely to fear or ignore these factors and instead address them creatively and constructively.

The high-level of attention that strategy development based on visioning and scenario building gives to uncertainty, risk and change makes it entirely consistent with principles of

adaptive management. Adaptive management is based on the recognition that in a complex and rapidly changing situation there can never be sufficient information to reach a settled “optimum” decision. Hence, the emphasis is on flexible planning backed by strong monitoring and information management systems that allow constant adaptation and the upgrading of plans and activities.

### ***Examples of generic scenario and strategy building***

**Scenario 1: Excess water** cause by floods (seasonal or intense), cloudbursts, hurricanes and typhoons that could damage or destroy existing WASH infrastructure

**Strategies:** (1) Protect as far as possible; (2) If protection is not possible, provide relief and rehabilitation support

#### ***Protection***

1. Improve design, construction and management of irrigation infrastructure as damage to WASH services by excess water is often caused by poor design and management of irrigation works.

- Modify the design for new structures to cope with high and sudden inflows (e.g., better spillways)
- Review siting of new infrastructure taking into account the possibility of 'black swan' events
- Modify existing water infrastructure for sudden excess water inflows (e.g. raise dam heights, increase off-site storage)
- Improve infrastructure management (e.g. spillways, O&M of canal systems)

2. Improve weather forecasting and information flows to irrigation managers as design capacities are often based on past trends in rainfall – which may no longer hold

3. Improve design of irrigation infrastructure to better withstand high water flows including building protection walls around pump houses

#### ***Relief***

1. Revised, improved and new disaster management strategies and plans for ensuring

water supply to affected communities as quickly as possible

2. Design emergency WASH systems that can be easily converted into more permanent solutions
3. Improve speed of replacing damaged WAS systems (e.g. aggressive supply chain repair, quick fund release, rapid staff mobilization)
4. Set up national and local Disaster Management Agencies with clear mandate and Guidelines for restoration of WASH services
5. Set up a donor coordination committee - with clear-cut mandates and guidelines to coordinate the channelling of relief funds and material, ensuring adequate attention to the restoration of WASH service provision

**Rehabilitation** of WASH infrastructure and livelihoods so that affected communities can begin paying for WASH (and other) services as quickly as possible

1. Concessional (micro) finance: Make available funds for restoring livelihood activities by affected communities.
2. Livelihood Advisory Services: Communities in areas where traditional livelihoods have been destroyed by extreme events, new livelihoods may have to be begun, for which advisory services would be necessary.

**Scenario 2: Insufficient water** (erratic rainfall, drought for longer periods or for consecutive years) which will not damage WASH infrastructure but could affect service delivery because of source unsustainability

**Strategies:** (1) Prepare to minimize loss of access; and (2) provide relief

#### **Preparation**

1. Build local-level buffers for ground and surface water through best possible supply augmentation and demand management, community management and restrictions on surface and groundwater use
2. Build food and fodder buffers with support from community, government and the private sector

3. Provide easy credit through micro-finance so people can buy food and even water, if necessary

4. Provide advance weather information & appropriate cropping strategies to farmers so that they can plan appropriate cropping strategies

5. Arrange for the use of private agricultural wells that have water when drinking water sources have dried.

#### **Relief**

1. Create management plans and systems to deal with WASH provision in affected areas.

Since WASH services are only one of many that are likely to be affected, more generic systems can be evolved including the following:

- Move water to affected areas in trains and tanker trucks and arrange for free distribution to affected communities
- Requisition private wells through government policies and arrange for using this water for free public distribution in affected areas
- Provide free livestock shelters to look after private livestock that owners cannot provide for – and arrange for adequate water in these shelters
- Carry out emergency drilling and pipeline connections in affected areas using government funds or aid

#### **3. Preparing and implementing plans**

Arguably, greater risk and uncertainty devils planning and implementation of WASH services, with political considerations, bureaucratic transfers, technocratic capacities and overall 'resistance to change' being key factors.

Therefore, while it is vital that adequate planning and effective implementation are given top priority in the face of climate change threats, and that such planning and implementation is facilitated well.

A critical issue that needs to be overcome is the need for multi-sectoral attention to the problems of WASH service delivery in the face



of climate change uncertainty and risk. It is now widely accepted (e.g. WWC/CPWC/IUCN/IWA, 2009) that solutions to WASH issues have to be found outside the 'Water Box'. This, however, is only one of other challenges in preparing and implementing plans to address climate change in WASH. While each socio-political situation will have to be dealt with on its merits, the following steps could be useful.

- **Inform politicians:** Raise awareness of senior politicians, bringing out the potential economic and political gains of such preparation. Politicians control the bureaucracy through instructions and are sensitive to the impact of their actions on voters. However, informing politicians of the issue on hand will require condensing research findings into clear messages.
- **Present findings clearly:** Findings of scenario building exercises, along with their pros and cons, and financial implications and alternative decision-making rules - e.g., precautionary principle, minimum loss of life and livelihood, fastest possible relief and rehabilitation – have to be presented clearly to policy makers and bureaucrats not only so that they are convinced of the need to act, but so that they in turn can justify their decisions and funding (re)allocations to their respective constituencies.
- **Focus on long-term changes:** While short-term government action can be supported by executive orders, effective long-term action (beyond the term of individual governments) will require legislation and national-level policies. It would therefore be wise to begin work simultaneously on revising or creating water laws and policies to ensure the support necessary for providing adequate WASH provision during extreme events.
- **Information sharing to support implementation:** Decision-makers need awareness to plan and implement appropriate programmes, even in response to political directions. A frequent issue is the search for adequate information on possible

options. Support to share information, including learning alliances, knowledge management systems and information networks are likely to play a key role in this, and require appropriate support.

- **Community preparedness:** Finally, policies, plans and programmes have a way of remaining on paper without the support of local communities. Not only must local communities be informed but there should be adequate space given to them to contribute their ideas and suggestions to local adaptation strategies.
- **Coordination with disaster management:** Disaster preparedness exercises involving local communities have to pay sufficient attention to WASH issues – which implies that WASH professionals, organizations and local NGOs have to forge working linkages with the individuals and institutions working on disaster preparedness, mitigation and management.

### Conclusions

Whether or not climate change risks are overstated, recent global weather events and the toll each has taken on human lives, livelihoods, environment, and on built infrastructure, perversely have served to raise the profile of climate change in the eyes of policy makers. These thus represent an opportunity to set up systems to ensure the continuity – if not minimal disruptions to – WASH infrastructure under conditions of climate change.

WASH professionals, however, often struggle to see practical ways to develop adaptation measures into effective national and local policies. This note is an attempt to address this important and vital gap in WASH services delivery.

### For more information please contact:

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