Input to the Yemen Policy Note no. 4. on Inclusive Services Delivery

Addressing the Challenge of Extreme Water Scarcity for Reconstruction and Beyond

WOLD BANK GROUP

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1. Background

- **This note is a part of a series of policy notes prepared by the World Bank in anticipation of a post-conflict transition in Yemen.** These notes aim to identify immediate priorities for stabilization, recovery and restoration of services and infrastructure in the aftermath of Yemen's current conflict. A subset within these notes specifically focused on ways to restore service delivery in an inclusive manner immediately after conflict. As such, these notes examined short-to-medium-term institutional challenges facing the restoration and improvement of service across sectors. They focused on the immediate post-conflict priorities and challenges facing Energy, Water, Telecommunication, Education, Health, and Transport sectors in restoring services while also contributing to higher-level objectives of addressing systemic inequities and reinforcing trust in the state. These notes make practical suggestions to the Government of Yemen and international development partners to provide immediate post-conflict support to ensure empowerment, accountability, and better governance in service delivery.

- The current paper focuses specifically on steps required to restore Water services in a more inclusive manner immediately after the conflict ends Yemen.

2. Introduction: sector situation before conflict

- The conflict-related shock comes on top of a systemic water resource crisis, **already a driver of conflict.** The primary sources of water in Yemen are rainfall and groundwater; there is no perennial surface water supply. The annual renewable water resource is about 2.5 billion cubic meters (bcm), of which 60% is groundwater, and the rest is surface water. The current annual water use is about 3.9 bcm with an overall annual deficit of 1.4 bcm (MAI, 2013). This deficit is bridged by withdrawing fossil groundwater resources, which reduce water table by an average of 1-7 meters per year. Several major cities, such as Sana'a the capital city and Taiz city, are experiencing drying up of wells and are having difficulty in sourcing new bulk water. The agricultural sector consumes about 90 percent of water resources (ESCWA, 2015:32); (CES, 2008)

- **Yemen is one of the few countries in the world where poverty has increased over the last decade** According to the latest Household Budget Surveys data, the headcount poverty rate in Yemen stands at 34.1 percent of the population in 2014. This headcount is an increase from 2005 when the comparable estimate was 26.6 percent. Owing to the escalation of violence, conflict and fragility, which has severely impacted economic activity in Yemen, poverty is expected to have increased further, and perhaps more sharply since 2014. Many of the poor are facing increasing difficulty in paying for water and sanitation services. Real GDP declined by 28 percent in 2015 alone and is likely to have declined further in 2016.

- **According to the recent Yemen WASH Poverty Diagnostic, access to WSS has increased; however, due to**

conflict about 19.4 million people lack adequate access to clean water and sanitation, including 8.2 million who are in acute need. When comparing HBS 2014 with HBS 2005, and DHS 2013, improvements in access are seen across the board for the years 2005-2014. However, despite improvements for the pre-conflict period analyzed, overall levels of access to water and sanitation are very low internationally.

- **Most available data is pre-conflict, and institutional analysis is based largely on pre-conflict knowledge**. The situation is likely to be significantly worse than presented by existing data. This policy note explores broad institutional, financial and service delivery challenges facing Yemen's water sector prior to the conflict, supported by DHS and HBS data, and proposes possible options to contribute to restoring service delivery

Institutional arrangements

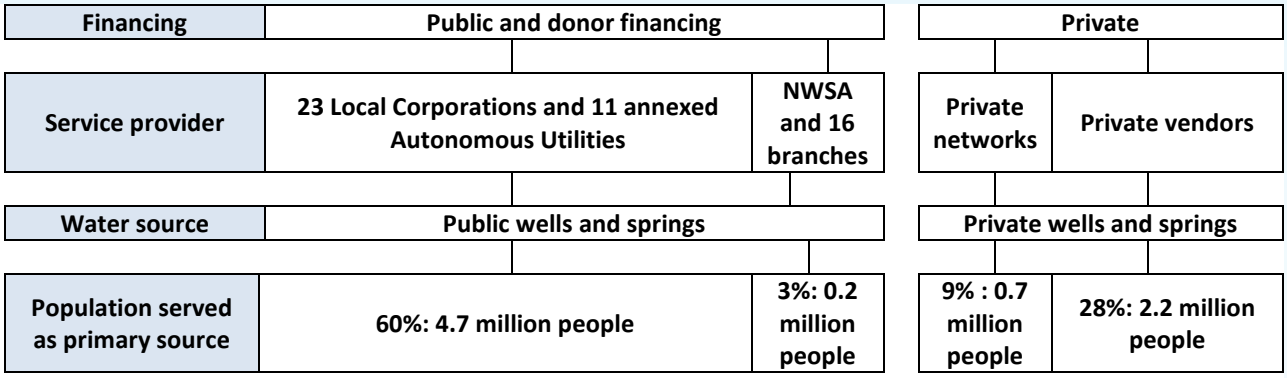
- **The water supply and sanitation delivery has been undertaken through a mixture of centralized, deconcentrated, and locally managed service delivery.** The two main ministries at national level are the Ministry of Water and Environment (MWE) and Ministry of Agriculture and Irrigation (MAI), and a water authority at the intermediate level, the National Water Resources Authority (NWRA), which sometimes manages water resources at the country level. The implementation agencies at governorates/regional level include branch offices of NWRA, NWSA, GARWSP (belongs to MWE), and MAI. The Basin committees are cross-cutting institutions to coordinate the works of all water authorities pertaining to basins and to implement action plans. The detailed description of the Institutional arrangement is provided in Annex 1 and below figure 1 provides a schematic of Urban water service and Figure 2 a schematic of rural water service.

- **Private sector is still not well organized and civil society is somewhat represented.** The private sector is mainly represented by owners of wells and tanker trucks who pump and transport water resources. The private sector has no formal structure and no major progress has been achieved by MWE and LWCs in creating a partnership with the private sector to provide water services in urban areas. Civil society is somewhat represented by a broad range of nongovernmental and non-profit organizations that are involved with water industry including: Water User Associations (WUAs) for the sub-basin level; Water User Groups (WUGs) for wells.

<u>Urban water and sanitation</u>

- **The service delivery in urban water supply and sanitation is mainly through the Local Water Corporations (LWCs); however, the private sector (informal) does fill gaps in service from the LCWs.** About 23 Local Water Corporations (LWCs) and 10 autonomous water utilities serve about 95% of urban households, working alongside the Local Councils of the Ministry of Local Administration (MLA) for urban and rural districts. The National Water Sector Strategy and Investment Program (NWSSIP, 2004, updated in 2009) has the following objectives for urban water and sanitation service: (i) Increase access for the entire urban population, through investment and by involving the private sector in both service provision and outsourcing of functions; Put utilities on a business footing whilst keeping services sustainable and affordable; and (iii) Ensure affordable access to poor.

Figure 1: Schematic of urban water and sanitation service delivery system



Rural water and sanitation

- **Several government authorities are responsible for rural development**, including constructing water projects for domestic use in rural areas. These authorities are the General Authority of Rural Water Supply Projects (GARWSP), the Social Fund for Development (SFD), the Public Works Project (PWP), and the Ministry of Local Administration (MLA) via the Local Council of districts. Several donors are also involved in developing water resources in rural areas including the World Bank, UNICEF, The Netherlands, Germany, and Japan. The responsibility of the GARWSP is to coordinate the efforts of the SFD, PWP and the donors to work together in a cooperative and complementary manner toward achieving a sustainable rural development (Heun & Vulto, 2008); (JICA, 2007); (World Bank, 2006a). The primary function of the GARWSP is to build water projects for domestic use in rural areas based on a demand-responsive approach (DRA) and on a cost- sharing mechanism through community-based organizations. It fosters the establishment of water user groups (WUGs) so as to engage communities in choosing the most appropriate technology, to participate in the execution of the project, and to manage them afterward in a sustainable way. Prior to the crisis, GARWSP was supporting about two thirds of the publicly financed rural water and sanitation schemes and had responsibility for coordinating all public interventions in the sector. (Heun & Vulto, 2008); (JICA, 2007); (World Bank, 2006a). The National Water Sector Strategy and Investment Program (NWSSIP, 2004, updated in 2009) has the following objectives for Rural water supply and sanitation service: (i) Rapid expansion of coverage with increased investment and a pro-poor bias, and with a transparent

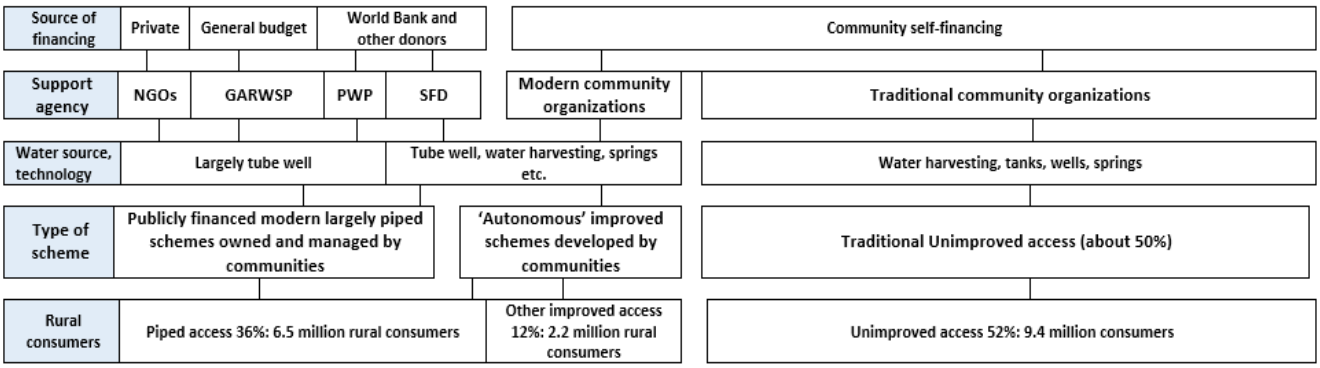


Figure 2: Schematic of rural water and sanitation service delivery system

investment application process and decentralized approvals; (ii) Making services inclusive, affordable and sustainable, and (iii) Improving implementation (a) GARWSP to be reformed and decentralized to governorate branches, and (b) Common approaches amongst the three public sector providers (which together put up more than 90% of schemes).

Financial sustainability

Urban water and sanitation

- **The MWE is responsible for setting tariff policy** for water and sanitation services in Yemen. The Updated NWSSIP (2009-2015) emphasizes the importance to increase accessibility to service water supply at an affordable tariff that reflects the real value of water so that to help in allocating water resources more efficiently and in achieving fiscal viability of utilities. The strategy hints that the water tariff would gradually increase at an affordable increment to move toward full cost recovery of capital and O&M over time. Based on the NWSSIP guidelines, the MWE uses two rules to confirm and approve tariff levels: (1) a cost recovery rule to achieve coverage needs, and (2) an affordability rule to cap tariffs for water and sanitation at a maximum of 5% of household budgets to take care of the poor segment of the society. The sanitation charge usually ranges from 70% to 80% of the water tariff depending on the infrastructure investment and O&M cost of each Local WSS Corporation. There is also a monthly connection fee of YR 500 plus a fee of 5 % for the Local Council.

- ***Central Government Subsidy for Urban Water Sector:*** **Generally, the tariffs of public LWCs is still highly subsidized** and it is very low when compared to the cost of per cubic meter from tanker truck. Ward et al., (2009: 41) mentioned that "In Sana'a, public network water costs only one tenth (1/10) the cost of tanker water." The central government has financially supported eight LWCs (out of 16) in 2012 and 2013 to finance their budget deficits for both recurrent and capital expenditures. The size of subsides varies from one LWC to another depending on the size of the network system and the financial and administrative capacities. Some of LWCs depend heavily on central budget for covering their operation expenses. The central subsidy for capital investment ranges from a minimum of 7% to a maximum of 88% of total capital expenditure in 2013. All LWCs rely greatly on the central government to finance water projects either from government's budget or donor agency's funds.

- ***Prior to conflict, there was already a constraint on collection and setting tariff at the right level in part because of the level of service, with conflict the LWCs have reduced to level of service due to damages, limited access to energy, further reduction in collection and reduced government ability to funds services.*** Although a Local Water Corporation (LWC) affiliated with Local Council can submit a tariff adjustment proposal to its governorate's Board, and then present it to the MWE for final confirmation, allowing the LWCs to be partially free to adjust their tariff according to the needs of covering the increasing service cost. only four LWCs have an average tariff greater than average production cost including Mocha, Mokalla, Aden and Amran (GIZ 2016). As a result, the private sector (informal) has filled the gap and provided service. This service, however, is more costly (reported to be ten time higher) and with limited water quality oversight.

Rural Water and Sanitation

- In its efforts to increase the access of rural residents to clean and sufficient water

supplies, the government reoriented GARWSP under the MWE to focus on developing water schemes for the countryside. The primary objective of GARWSP is to build water projects for rural areas and train rural residents at the project location to operate it at their own expense. It has no mechanisms to charge tariffs to recover capital costs or O&M costs. Only few rural water system that generate income for GAWSRP. Therefore, the GARWASP mostly relies on central budgets for capital investment and recurrent cost.

Key service delivery issues

In Urban water and sanitation service:

❖ Government and donors have given the LCs a clear mandate: (1) affordable service expansion and provision; (2) a business approach as (ultimately) self-sufficient utilities; and (3) protection of the poor. There are, however, structural problems that impede the required improvements in service levels and there is not enough cost recovery capacity in the system to generate the resources for an LC pro-poor strategy. Not surprisingly, LC investment is actually anti-poor.

❖ Expanding services requires heavy investment which government cannot provide.

❖ But, in order to expand services, need to secure new water resources especially in the high populated urban centers located in the western mountainous part of the country such as Sana'a, Taiz, Ibb, Dhamar, Amran, Hajja, Al-Mahwait, Saddah, etc.

❖ The transfer of water from rural to high populated urban areas is a challenges given the strong oppositions of rural communities.

❖ Quality service provision depends on adequate financing, efficiency and adequate bulk water supplies, only part of which is within the LCs power to achieve

❖ Affordable services depend on increased efficiency where options are limited

❖ A business approach ultimately requires higher levels of cost recovery which are generally opposed by consumers and by the local representatives on LC Boards

❖ Protection of the poor requires higher levels of government subsidy and new business models, especially PPP, which have encountered many constraints and little political support.

❖ ***With conflict all of the above are till existing and the LWCs have less mean to provide service, more difficulties to access energy (needed for pumping), repair damaged infrastructure, and maintain infrastructure, and limited funding from the government has reduced the human resources in the LWCs. The private sector (informal) stepped in, but with higher cost for people and no oversight on water quality delivered.***

Key issues for RWSS:

❖ Although data show improvements, access to safe water and sanitation remain very low by regional standards and well below urban levels.

❖ The sustainability of investment in the rural water sector is worrisome, given the data above as well as anecdotal evidence that shows that when GARWSP drills wells, it does not find water or for those wells that do find water, some of the wells go dry within 3-5 years. These results could in part be attributed to drilling without adequate feasibility studies and illegal drilling by powerful farmers.

❖ GARWSP project cycle is complex and long, with projects taking up to six years to complete. Further, most of the donors who provided funds to

GARWSP did not have the adequate fiduciary or technical supervision mechanisms, hence the impact and sustainability of these investments is questionable.

❖ There is little cooperation amongst agencies and no joint programming.

❖ Community ownership has increased but competition amongst communities inherent in DRA marginalizes the poorest, the more remote areas and the most water-scarce locations

❖ GARWSP is reluctant to tap the energies of CBOs and NGOs, and is still operating with a more top-down approach.

❖ The range of technologies offered is limited and focused on the higher cost, often unsustainable groundwater pumping sources, and schemes are vulnerable to failure as the resource dwindles

❖ GARWSP has adopted social mobilization and community capacity building only half-heartedly and women's role in project section and management remains limited

❖ Sanitation and health education are generally neglected in favor of meeting engineering and financial targets

❖ ***With conflict, all of the above issues are still a concern and the GARWSP has less means to build turnkey water service delivery and sanitation, to support communities in managing the water and sanitation systems, and limited funding from the government has reduced the human resources.***

Box 1: Damage Need Assessment Phase 1

In this damage assessment for the WASH sector, the major asset classes considered included water towers/tanks, water pumping stations, water reservoirs, waste water treatment plants, pumping stations, building and offices, tube wells and treatment facilities as indicated on below table. Because of difficulties in assessing the functionality of sub-surface piped networks through satellite imagery and because damage to the electric grid has compromised the delivery of water services, damage information on .sub-surface water supply, drainage and sewage was limited

Damage costs to WASH facilities in Sana'a, Taiz and Aden ranged from US$ 78 million to US$ 96 million as indicated on below table. Due to a lack of reliable data and access on the ground, damage costs to Zinjibar's WASH facilities could not be es-.timated

Table . City-Specific Damage Cost in the WASH Sector

WASH			
City	*Low Estimate ((US$M*	*(Cost (US$M*	*(High Estimate (US$M*
Sana'a	22	24	27
Aden	48	53	59
Taiz	9	10	11
Total	**78**	**87**	**96**

.The actual damage costs might even be higher

Most baseline, unit cost and damage information for this assessment originated from the .water and sanitation local corporations in Sana'a, Aden and Taiz

3. Conflict-related impacts and challenges

- **The political instability and armed conflict that erupted across the country since early 2011 have noticeably aggravated water service delivery.** It has led to direct and indirect effects on water infrastructure and water management operations. The MWE published the latest cost estimate of damages on water infrastructures as of February 2016 indicating that the total costs can reach to more than $170 million (MWE, 2016). The Damage Needs Assessment (phase-1) prepared by the donor community indicates that water infrastructure, including distribution systems, pumping stations, water tanks, and well-fields, were heavily damaged in some cities and towns, most notably in the cities of Aden, Taiz, Zinjubar, and Sana'a. Such damage has disrupted water deliveries in these four cities. The Damage Needs Assessment provided a sense of how the infrastructure were damaged, some information from social media on how the service delivery got impacted, even if these are anecdotal evidence it does illustrate the range of deterioration of service. Indeed, it was already pre-conflict situation that Yemen's public water-distribution networks suffered from chronic intermittent delivery, but the conflict has extended such intermittency to the point where thousands of households across the country resort to searching for additional water sources, mainly collecting water from Mosques or from donated standpipes/tanks, or purchasing water from private tanker trucks or harvesting rainwater (Donaghy, 2015); (Al-Mujahed et al, 2015).

Figure 4: LWC in Hadramout request customers to pay their water bills

- **Additional challenges faced by water services.** According to various media outlet sources including TV/press interviews with local water corporations (multiple sources) indicating that many more water utilities have partially or totally halted services during 2015 not because of any physical damages but due to the lack of fuel supplies, long periods of electrical outages, a huge lack of revenue collection, water theft, tampering water meters, and high absenteeism among unmotivated technical staff who must work without salaries.

- **The business of private tanker trucks has been flourishing over the past five years in both rural and urban areas**, and is currently the major source of domestic water in many cities and towns including Sana'a, Taiz, Ibb, Mahwait, and Manakha. Even though the private water tanker trucks, like any other business, suffer from the high prices and the shortages of fuel, they have leveraged their comparative advantage to purchase fuel from the black market to continue their operation (Alsharmani, 2015). Fuel and other price rises has impelled water tanker prices to more than double: "the price of a water truck delivery was YR2,000 in parts of Al Hodeida before the conflict, it is now YR8,000. In Sana'a where a delivery cost YR4,500 before, it costs YR10,000 now" (OXFAM, 2015a); (Human Right Consultant, 2015).

Sanitation services have also been severely impacted by the political crisis and armed conflict. According to multiple media outlet sources, the number of sewage system breakdowns have increased dramatically over the past four years due to lack of maintenance caused mainly by the reduction of revenues to pay workers. Most of the sewage leaks are taking place in Hadhramout, Hodeida, Taiz, and Aden. Heightened health risk, together with food and water insecurity, have become the daily burden on the majority of Yemeni households.

Figure 3: Sewage Breakdown in Hodeida

Source: http://www.alwatanvoice.com/arabic/news /2015/09/22/780938.html#ixzz4GRYzbdAK

4. Key principles of re-engagement and reconstruction

- **Yemen is trapped in a vicious 'cycle of conflict' with chronically weak state institutions directly contributing to the current round of violence**. This violence, in turn, has further undermined state institutions thereby portending even more violence for the future. The continued weakening of national institutions has also diminished chances of sustainable peace as any peace-agreement would be undermined without a strong institutional foundation to safeguard its terms. Therefore, any recovery and reconstruction plan post-conflict would also have to mandatorily focus on reinforcing state institutions—while addressing urgent humanitarian needs—to prevent the slide back into conflict. Experiences from around are replete with instances where the singular focus on post-conflict humanitarian relief—without regard for institutional transformations—

Box 2 : Key Reconstruction challenges facing Yemen's water sector

- Water scarcity, exacerbated by conflict, could trigger further conflicts
- Supply chain constraints include lack of fuel, power, conveyance, nonrevenue water including increased theft, unpaid salaries (leading to absenteeism), source depletion
- Cost of private (tanker) water is high and water quality is questionable
- Cholera cases have been linked to lack of WASH services
- Physical damage to water distribution system including to pumping stations, water tanks, and well fields
- Lack of fuel supplies and electricity that stop the operation of pumping stations and treatment facilities
- Selling of LCs' appropriation of oil products to the black markets
- Vandalization and theft of LC property including cars, water meters, chlorine, oil products, sewage covering caps, copper electrical cables
- Proliferation of checkpoints, making it challenging and dangerous for tanker trucks to transport water
- Lack of backup generators to operate wells, pumping stations and the treatment in case electricity is cut off
- Lack of backup equipment and spare parts for wells and producing plants
- Shortage of wells that can be used as backup for emergencies
- Insufficient funds to cope with emergency needs

have ended up being costly missed opportunities for breaking the cycle of violence.

Box 2: Yemen: Damage assessment in twelve Local Corporations

A 2016 study by GIZ reveals the status and needs of Yemen's urban water and sanitation system, based on a survey of twelve Local Corporations. There is a very large number of IDPs everywhere and a very difficult socio-economic situation with widespread shortages of basic necessities and high prices. A large number of people are without access to improved water and sanitation. The situation of the utilities is very difficult, characterized by negative cash flow, depleted bank balances, budget shortfalls, high levels of unpaid liabilities and receivables, and drying up of fiscal and donor transfers. The difficult cash situation has led to non-payment of salaries and many staff are no longer at work. There has been widespread physical damage and pillaging, with many wells out of operation and widespread destruction of networks, resulting in growing interruptions in water supply and increase in non-revenue water. Investment and expansion are at a halt almost everywhere.

Immediate actions required are generally:

- Immediate cash infusions to pay salaries and procure supplies and fuel
- Repair of major damage
- Rehabilitation of wells and pumps
- Re-equipment of operation and maintenance capability
- Reconstruction of offices
- Emergency sanitation and health education provision

Source: DAS 2016. Yemen Water Sector: A Managerial, Financial, Human Resource, Operational Structures Assessment of Twelve Water Corporations, and their Affiliated Utilities. GIZ Sana'a/Eschborn

- **There is thus a clear need for new thinking on Yemen to support more sustainable and inclusive ways of service delivery during conflict and immediate post-conflict periods.** In this context, the key challenge for Yemen's development partners is to devise new and innovative ways to support the country, to not only recognize the fundamental causes and effects of conflict and fragility but also, importantly, enhance the resilience and coping capabilities of communities and households. Therefore, these notes on inclusive service delivery—including the current note on Water—propose a new approach that focuses on attending to urgent service delivery needs in the most affected parts of Yemen while also incrementally enhancing inclusiveness, resilience and thus, the effectiveness of service delivery institutions.

Urban water and sanitation

The DNA and the GIZ-executed DAS have given estimates of damage to urban water and sanitation infrastructure in several cities (see Box 1 DNA and Box 2 the GIZ DAS). These estimates will need to be confirmed and a rapid institutional status assessment will be required to determine what capacity exists in the LCs or at NWSA for procurement of immediate needs. Several LCs have specialized procurement units, largely to deal with donor projects, and these may still have capacity.

Rural water and sanitation

A localized (deconcentrated and/or decentralized) approach will be essential, but support will be required from central agencies. A rapid institutional status assessment will be required to determine what capacity each of the main agencies has (GARWSP, SFD, PWP) and for what type of intervention. All other capacity should also be included (UNICEF, Save the Children, Oxfam, national NGOs…..) These agencies should be incentivized to form governorate/district level teams to conduct: (1) joint identification of needs; (2) preparation of a recovery and reconstruction program; (3) implementation, with roles determined by the procurement and field delivery capacity of each agency and its skills in the required technology. A possible implementation set up could be: PWP carries out procurement; GARWSP and PWP take care of pumped schemes; SFD takes care of 'other technology' schemes such as rainwater harvesting; and SFD, UNICEF and NGOs take care of community mobilization, linkages with health and nutrition, and monitoring and reporting at local level and capacity rebuilding.
Security will be needed and government and donors will need to be on board from the outset. The approach and programs will need to be agreed with government as far as possible, at both central and local levels. Donors will need to be ready to appraise the programs as they are prepared and to provide financing and to support procurement as soon as possible. Donors will need to make sure that actions in the short term are consistent with – and as far as possible contribute to – the longer term vision of rural water and sanitation within NWSSIP.

5. Way forward: shirt to medium term

Short-term and medium term for Reconstruction and Restoration

1. **Working with UN agencies on the ground (such as UNICEF that works in the water sector) is a way for multilaterals (such as the Bank) to implement emergency activities.** The UN agencies have the ability to manage fiduciary requirements in fragile context. For example, UNICEF also has good relations with the long-standing institutions in the water sector in Yemen, and works well through community engagement, which is important in terms of sustainability including stewardship of Yemen's very scarce water resources, and makes best use of the existing supply chains. UNICEF also allows to have the humanitarian activities while in parallel building the need for better water security and contributing to preserving institutions balancing, essential to keep institutions functioning and the social fabric during protracted conflicts like the one we are being witnessed in Yemen.

2. **In order to rebuild the institutional capacity, it is important to design emergency activities with innovative service delivery arrangements modalities and building, to the extent possible local institutions, NGOs, private sector (formal and informal) and communities or rebuilding the lost capacity.** In a context of fragility, the WDR (2011) indicates the need to factor the time needed to restore/rebuild the institutional capacities. As such, working on the water supply and sanitation service delivery in both urban and rural areas requires a combination of localized efforts and central or deconcentrated technical and financial support, coupled with inter-basin and cross-sector resource cooperation.

Indeed, in Yemen water experience overall demonstrates that the sector, like much of the geography of the country, operates most naturally at a local, decentralized level. The central control has not often succeeded, and de facto, citizens have revert-

ed to traditional, local solutions. This has been also observed during conflict with people coping on lack of water and sanitation by using the informal private sector and NGOs for the ones that had less ability to afford service. However, local capacity – both technically and financially – at which the emergency work would be conducted is not sufficient. Therefore, once the central level is restored, it can play again to role of technical and financial support of the local level. Before the central level is restored, the UN agencies can be a proxy for the local agency on the technical and through donors and projects financial ability to support and contribute to maintain the capacity of local level. The UN agencies are already working with the keys actors such as the growing local private sector (tankers),NGOs, local institutions, communities and users group, and in the case of Yemen it is important to ensure the most efficient use of water given the water scarcity and need to reduce the mining of water resources.

3. **Need to contribute to restore the social contract: moving from informal private sector to an organized private sector working in coordination with formal institutions to provide improved water quality to citizens and protection of the resource.** Given the reality that the private sector is already involved in providing water services to thousands of households, it is imperative to integrate it into water planning by making it easy for tanker trucks to cooperate with the regulatory agency. Create a partnership with private tanker trucks to deliver water from LWCs wellfields and offer them to the customers at affordable cost. Under the now closed Bank funded project Water Sector Support Project (WSSP), a pilot intervention was planned to be implemented in Sana'a under the leadership of the deceased Mayor of Sanaa city, Ministry of Water, and the Local Corporation to move from informal individual tankers, to organized tankers, trained to become in the medium to long-term providers of water services for areas unserved by the LWCs and GARWSP. Building on this vision allows ensuring a safer water quality delivered to citizens, and an optimized selection of pumping areas to avoid polluting the groundwater resources (with untreated wastewater and other sources of pollution).

Box 3: working with (informal) private sector to deliver service

A number of projects (Bank funded and other donors) in the water sector have explored various ways to work with tankers, for example Sierra Leone, Liberia, West Bank-Gaza, etc. These provide useful lessons on how to be inclusive of the private sector/market oriented services in the supply chain of delivering water. Steps that could be taken in the short-term: (i) LCs/GARWSP could ease a registration process, thereby stopping the operators from harassing government staff; (ii) LC/ GARWSP could provide an enabling framework to encourage the private sector to invest in tanks, cars, and pumps; (iii) LC/GARWSP/NGOs/partners could help develop water markets by creating competition for buying and selling water; and, empower water user associations to negotiate water transfers from rural areas to urban areas for the best price that they can negotiate.

4. **On the infrastructure type of activities, the urban water supply and sanitation services could focus to some target areas to restore basic service delivery and keep public health threats in check.** A combination of actions would

support the first steps of reestablishing basic urban service delivery and greatly reduce the risk of public health threats such as cholera spreading. The actions need also to be designed to generate short-term job opportunities through both labor-based works and the semi-skilled labor requirements for software activities such as customer enumeration. Possible actions: (i) **Short-term revenue support for staff, electricity and chemicals** – To address immediate cash-flow issues, a tapering recurrent-costs interest free loan would be made to LCs/AUs over a period of a year. LCs/AUs would be individually assessed for their needs; (ii) **Cost recovery management –** Support for reestablishing cost recovery would be initiated through low-cost short-term actions targeting commercial losses (e.g. customer enumeration, improving billing systems), and followed up with medium-term works program to address technical losses (emergency repair of critical infrastructure – wells, pumps, pipes etc.); (iii) **Tanker filling stations and management –** Tankered water has become a wide-spread alternative provision mechanism. In order to improve the quality of water provided by tankers LC's would be supported to set up tanker filling stations and a system of regulating private tankers in towns and cities; and (iv) **Back-up power** – With widespread damage to the electricity production facilities small high-speed diesel generators are being used for water pumping and waste water treatment. Analysis of short- and medium-term lower cost alternatives will be assessed and supported; for example, options to use solar pumping in selected areas will be assessed.

5. **Rehabilitating damaged rural water supply systems** to prevent disease outbreaks in rural communities and rebuilding of rural livelihoods. The interventions could focus on rehabilitating community water project, including wells, pipes, water tanks, connections, etc. Job creation projects are among the most effective means of stabilizing communities and keeping peace immediately after conflict, and they buy time until private sector activity returns to absorb the labor supply at stable, market-clearing wages. Possible activities: (i) **Rehabilitation of rural water infrastructure** – including rehabilitation of components of water supply systems that have been damaged during conflicts; (ii) **Provision of communal water storage tanks** – especially in the areas of IDPs gathering and camps; (iii) Provide **short-term fuel assistance** to rural water projects; (iv) **Water Trucking** for conflict-affected communities/ displaced people IDPs; (v) Provide assistance of **spare parts and O&M costs** to local water corporations/projects; (vi) Provide **chlorination and disinfecting service** for water sources in rural areas ; (vii) Provision of **replacement water pumps or pipe networks** damaged by conflicts; and (viii) Completion of un completed water supply schemes.

Annex 1: Description of the institutional arrangements

- **Two main ministries at the national level**: Ministry of Water and Environment (MWE) and Ministry of Agriculture and Irrigation (MAI), and a water authority at the intermediate level, the National Water Resources Authority (NWRA), which sometimes manages water resources at the country level.

- **The implementation agencies at governorates/regional level** include branch offices of NWRA, NWSA, GARWSP (belongs to MWE), and MAI. The Basin committees are cross-cutting institutions to coordinate the works of all water authorities pertaining to basins and to implement action plans.

- **About 23 Local Water Corporations (LWCs) and 10 autonomous water utilities** serve about 95% of urban households, working alongside the Local Councils of the Ministry of Local Administration (MLA) for urban and rural districts.

- **Private sector is mainly represented by owners of wells and tanker trucks** who pump and transport water resources. The private sector is still not well organized and has no formal structure. No major progress has been achieved by MWE and LWCs in creating a partnership with the private sector to provide water services in urban areas. There are also legal conditions to retain current staff, a widespread perception that people's ability to pay a fair price is weak, and an expectation of government interference in imposing rates to protect low-income earners (ESCWA, 2011); (Sahooly, 2013).

- **Civil society is somewhat represented** by a broad range of nongovernmental and nonprofit organizations that are involved with water industry including: Water User Associations (WUAs) for the sub-basin level; Water User Groups (WUGs) for wells; community and indigenous groups; and, professional associations. Water User Associations have not been empowered to make and enforce rules and collect fees which make community water management more efficient and sustainable (Bruns & Taha, 2009). Many of the WUGs were established without a unified mandate and clear scope of works.

- According to law, the MWE/NWRA are jointly responsible for organizing and developing water resources, plans and policies. In consultation with the MAI and Ministry of Local Administration (MLA), the MWE/NWRA are entitled to prepare the National Water Strategy (NWSSIP) and to form water basins and water zones committees. At the sectoral level, the MAI is responsible for formulating policies and legislation which regulates the use of the irrigation water in line with the national water policies and plans. The MWE also has a responsibility to supervise LWCs (public utilities) and all water supplies to the domestic and industrial sectors. At basin level, the water law authorizes NWRA to divide the countries into water basins and water zones.

- **Some overlapping and duplication**: the MWE has a formal responsibility to allocate water resources among all users and to formulate all water policies via

the NWRA (100% of water resources); conversely, the MAI has a specific responsibility to formulate water policies related to water for irrigation through the Irrigation and Land Reclamation Sector. In theory, the MAI is only a recipient of what the MWE/NWRA will allocate to them, but since irrigation accounts for 90% of total water use, the MWE's oversight remains merely theoretical (Alharithi, 2010:4); (Zeitoun, 2009:19); (Ward, et al, 2007); (Al-Ghorbany, 2014:38 & 150);

Urban water and sanitation

- **Before 1997, the municipal water supply in cities and towns across the 22 governorates was managed by the National Water Supply Authority (NWSA).** The NWSA was a highly centralized management system with many branch offices scattered around the country, but it was hampered by poor infrastructure, intermittent services, unclear rules and regulations, and highly subsidized tariffs (Kalbermatten, 1996); (Ward, et al., 2007).

- **In 1997, the government issued a cabinet resolution based on a technical advice from the World Bank to decentralize the urban water sector** (ESCWA, 2011); (Sahooly, 2013). Accordingly, the government gradually established public utilities at governorate level called Local Water Corporations (LWCs) which by 2011 covered the major capital cities/towns of 15 governorates and with 30 branches covering 30 small towns within these 15 governorates (13 branches with autonomous principles and 17 branches with non-autonomous principles) (Ward, et al., 2009).

- **A Board of Directors chaired by each governorate's Governor oversees the autonomous utilities of LWCs,** which have the power to hire staff and to impose a tariff, which needs to be approved by the MWE. In theory, the LWCs and their branches are currently serving 95% of the total urban population (Ward, et al., 2009). However, the level of coverage is still relatively small because the expansion of service does not keep pace with urban population growth (World Bank, 2006a).

- The branches of LWCs with non-autonomous principles affiliate to the main LWCs in their governorates and they receive financial support from the main LWCs. Furthermore, the government kept 16 branches of the NWSA to supply water for seven more governorates and towns that have no LWCs, which cumulatively cover only 5% of the total urban population (Ward et al., 2009).

- The National Water Sector Strategy and Investment Program (NWSSIP, 2004, updated in 2009) has the following objectives for UWSS:

1. Increase access for the entire urban population, through investment and by involving the private sector in both service provision and outsourcing of functions
2. Put utilities on a business footing whilst keeping services sustainable and affordable
3. Ensure affordable access for the poor

Rural water and sanitation

- **Several government authorities are responsible for rural development**, including constructing water projects for domestic use in rural areas. These authorities are the General Authority of Rural Water Supply Projects (GARWSP), the Social Fund for Development (SFD), the Public Works Project (PWP), and the Min-

istry of Local Administration (MLA) via the Local Council of districts. Several donors are also involved in developing water resources in rural areas including the World Bank, UNICEF, The Netherlands, Germany, and Japan. The responsibility of the GARWSP is to coordinate the efforts of the SFD, PWP and the donors to work together in a cooperative and complementary manner toward achieving a sustainable rural development (Heun & Vulto, 2008); (JICA, 2007); (World Bank, 2006a).

- **The GARWSP consists of a Headquarter (HQ) in Sana'a with 10 branches in ten governorates.** It has 525 staff, of which 280 are at HQ while the remainder is in the branches (JICA, 2007). Over the past decade, the GARWSP received a broad range of technical assistance from donors to enhance its functions and to transfer some of its duties from HQ to governorate branches. Under the supervision of GARWSP, hundreds of water projects financed by government and donors have been executed in coordination with local councils, the PWP, and the SFD (MAI, 2013).

- In its efforts to increase the access of rural residents to clean and sufficient water supplies, the government reoriented GARWSP under the MWE to focus on developing water schemes for the countryside. The primary function of the GARWSP is to build water projects for domestic use in rural areas based on a demand-responsive approach (DRA) and on a cost- sharing mechanism through community-based organizations. It fosters the establishment of water user groups (WUGs) so as to engage communities in choosing the most appropriate technology, to participate in the execution of the project, and to manage them afterward in a sustainable way. Some success was achieved: in some cases, the community even offered to share 40% of total project costs. However, the GARWSP still suffers from many challenges, including overstaffing of unskilled employees, interaction with local councils which lack experience and capacity to implement any project, and reliance on HQ for financing and expertise (JICA, 2007). But notably, where GARWSP often used to support stretched out and fragmented approaches (e.g. communities received drilled wells one year and pipes another year, pumps and services in the third or fourth year etc.), GARWSP more recently followed the Bank's (others?) advice to shift and focus on turn-key projects that deliver water services and ensure suitability of investments.

- **With donor funds, the PWP focuses on constructing water** projects **using local resources, especially labor**. To equip water projects with pumps and water pipes, it coordinates with GARWSP to procure them; after that PWP assumes the responsibility to install them and then train local beneficiaries to operate and manage the projects. The SFD follows the same procedures of the PWP in implementing water projects, and it has also recently engaged in building small projects for harvesting rainwater and constructing small water schemes by drilling wells and equipping projects with the necessary pumps and pipes.

- **Providing and ensuring water supply for rural areas is one of the top priorities of the NWSSIP**. The goal in 2004 was to provide water services to more than 5 million inhabitants of rural areas by 2015. The NWSSIP Update (2009-2015) set a target for rural water supply to reach to 62.5% by 2015. The objective is to provide

sustainable water supply at an affordable rate with suitable sanitation system which should be fair and equal. An aim was also to develop a decentralized mechanisms system that fits the rural society and to enhance community participation through a demand responsive approach (DRA) to implement projects, and they chose the appropriate technology that meets the needs at lower cost.

- The National Water Sector Strategy and Investment Program (NWSSIP, 2004, updated in 2009) has the following objectives for RWSS:

1. Rapid expansion of coverage with increased investment and a pro-poor bias, and with a transparent investment application process and decentralized approvals
2. Making services inclusive, affordable and sustainable
3. Improving implementation

- GARWSP to be reformed and decentralized to governorate branches
- Common approaches amongst the three public sector providers (which together put up more than 90% of schemes)