Pre-Crisis Market Mapping and Analysis:

The water market system in the context of severe flooding

Badin, Ghotki and Sanghar Districts, Sindh Province, Pakistan

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Contents

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Executive summary

Pre-Crisis Market Mapping and Analysis (PCMMA) is a relatively new approach to conducting market assessments prior to emergencies in order to anticipate how markets will respond after a shock occurs. The PCMMA in Pakistan was the first of three pilot PCMMA assessments that the IRC is conducting in 2015 in order to generate learning that can be used to refine the approach and the PCMMA guidance manual, while also providing information to humanitarian actors in Pakistan to feed into strategic and operational emergency planning efforts. This PCMMA exercise additionally served as an opportunity to build the capacity of humanitarian practitioners to carry out market analyses in humanitarian contexts.

The PCMMA took place from 18 May to 1 June 2015 in Sindh, Pakistan, covering Badin, Ghotki and Sanghar districts. The exercise was hosted by the IRC, with participation from eight other organizations. The analysis team followed the PCMMA guidance to apply an approach similar to that of the Emergency Market Mapping and Analysis (EMMA) Toolkit in a pre-crisis context. For the purpose of this PCMMA assessment, the severe floods of 2010 (for Ghotki) and 2011 (for Sanghar and Badin) were selected as the reference crises. The team examined how the floods impacted the function of four selected critical market systems in order to draw conclusions about the likely impact of future floods on the market systems and to propose appropriate market-based preparedness and response interventions. This report presents the findings and recommendations for the drinking water critical market system in Badin, Ghotki and Sanghar Districts.

The target population for this study was the flood-affected population in the three districts, totaling an estimated 359,000 households. The main underlying factors affecting the choice of water source available to the focus population are location (rural v. urban) as well as relative wealth of each household. Those who reside in urban and peri-urban areas, an estimated 20% if the population in the three assessed districts, have different options to access drinking water, including municipal water schemes, private or public water plants, and different water delivery options. In contrast, rural populations rely almost exclusively on springs, wells, hand pumps or open water sources for drinking water.

In normal years, the drinking water market provides sufficient volume of water for the focus population, although there are concerns about water quality stemming from consumer practices and the consumption of water from unprotected sources. During emergencies, despite the significant damage to the main sources of drinking water, alternative sources of water, including bottled water and newly growing water filtration services, can scale up the supply of water during crises. However, the main constraint to the increased provisioning of water is damage to transportation infrastructure. Both the price of water and number of business actors involved in water supply suggest a competitive market environment, both for water filtration plants and for bottled water companies.

It is difficult to quantify the amount of water produced by water filtration plants and bottled water producers in the baseline period, and even less possible to quantify the amount available during the flood emergency. However, we can fairly conservatively estimate that the water sources in the drinking water market system *cannot* realistically provide the total volume needed to meet the needs of the affected population. Additionally, with the anticipated limitations on road infrastructure, bridges and transport

networks, it is even less likely that market actors or NGOs will be able to move the required volumes of water to those people in need.

As a result, the markets are limited in their ability to provide adequate drinking water to make up for the 50% loss of clean water provided by wells and hand pumps during floods. As such, the only remaining source of water for the affected population remains unprotected sources, principally flood water. To ensure that affected communities can safely consume this water, additional measures and program activities should be implemented to promote water treatment, prepare communities for reduced access to drinking water and pre-position clean water and/or water treatment materials close to the affected populations.

This report recommends the following market-sensitive programming options to meet the drinking water needs of the affected population in the case of future severe flooding:

- **Provision of bottled water is appropriate for the first month for both rural and urban areas.** During the early phase of emergency response to flooding, many roads will be inaccessible, and bottled water can be an effective means of rapidly providing clean water to affected people. Additionally, bottled water can more easily be distributed by boat or air to affected areas. However, after the initial emergency response phase (after about 1 month), bottled water will not be appropriate, as other more plentiful and cost-effective water sources become available.

- **In rural areas, distribution of filtered/treated drinking water by jerry can or by water tankering will be required.** In-kind distribution of drinking water will be necessary in rural areas because existing sources of water will be contaminated or inaccessible. Trucking (tankering) water will likely be the most cost-effective way to delivery large volumes of water to affected areas if roads are accessible. If trucks cannot access affected areas, distribution of filled jerry cans by boat may be an alternative.

- **In urban/peri-urban areas, provision of water vouchers for bottled/filtered water.** These areas have more access to retailers who sell bottled water as well as water treatment plants that produce bottled water. Vouchers redeemable at local water retailers and producers will lead to the creation of additional networks that will expand the coverage of bottled water distribution during and after the flooding, effectively expanding the number of households consuming high quality drinking water. Water vouchers will be particularly relevant in areas with multiple water filtration plants and large bottled water markets, but in some areas, they may not be feasible.

This report makes the following recommendations for reducing the possible impact of future floods on the drinking water market system and on the target population's access to it:

- **Installation of hand pumps in elevated areas where displaced communities take refuge during floods.** NGO and government actors should install protected water sources in elevated areas where people take refuge during floods. Mapping evacuation/displacement areas and improving infrastructure and services available in those locations will effectively reduce the need for assistance and allow affected populations to rapidly and readily access safe drinking water during

floods. The cost associated with new hand pump installation will be significantly less than the cost of distributing bottled water or water tankering for several months during emergencies.

- **Pre-position water tankering equipment near affected areas as well as agreements with district-level water treatment plants or water sources to fill tankers.** Because water tankering equipment is scarce in the districts studied, NGOs and government actors will need to identify and bring in their own equipment to affected areas. Doing so before the emergency strikes will speed up the response and enable a more rapid and cost-effective transition from distributing bottled water to trucking tanked water.

- **Pre-position agreements with water treatment and bottled water retailers in urban or peri-urban areas to accept vouchers for drinking water during floods.** In urban and peri-urban areas, where water filtration plants exist or where there are large numbers of bottled water retailers, it will be necessary to pre-position agreements with filtration plants and retailers to accept vouchers when flooding happens. Conducting vendor assessments, setting targets for the number of beneficiaries to reach and signing contracts with filtration plants and/or retailers will all enable these market actors to plan for increasing their volumes of drinking water to supply the volumes needed by the affected populations and will also speed up the response.

- **Cleaning, treatment and repair of wells and hand pumps (using CFW) in rural areas.** NGOs and government actors should undertake cash for work programs prior to flooding to clean, treat and repair drinking water wells and hand pumps prior to the onset of flooding. This intervention will increase the number of functioning protected water sources before emergencies and will increase the likelihood that there are more protected water sources available and accessible after floods, reducing the need for emergency drinking water assistance. It will also provide much-needed cash to families, which can enable them to better manage and respond to flooding when it occurs.

- **Promote household-level water treatment strategies, in normal periods and particularly during floods.** Perhaps the most cost-effective way to ensure affected populations have access to safe drinking water is for people to treat water to make it safe for drinking at the household level. NGO and government actors should promote household-level practices to ensure all people consume only safe drinking water, particularly in normal times, a practice which will then carry over into flood times. In order for household treatment promotion efforts to be effective, a KAP analysis is needed to better understand water treatment preferences and practices.

- **Support growth of private-sector water filtration businesses.** Government actors should continue to adopt policies promoting the expansion of private-sector water filtration businesses, which compete to provide high quality water at low costs to the urban and rural population. NGOs can advocate to the government to support the start-up cost or to subsidize the distribution networks of these filtration plants in order to reach the maximum number of people with locally-produced clean drinking water.

I. Overview of assessment

Objectives

The Pre-Crisis Market Mapping and Analysis (PCMMA) guidance document[1] is a practical, step-by-step resource to guide market analysis practitioners and team leaders to conduct market assessments prior to emergencies in order to anticipate how markets will respond after a shock occurs. PCMMA is designed to help agencies improve response preparedness, to feed into contingency planning efforts and to contribute to the design of disaster risk reduction programs by identifying certain parts of market systems which may be vulnerable to shocks. Ideally, pre-crisis analysis will help to increase the speed of emergency responses and provide guidance on how to strengthen market systems ahead of emergencies to reduce the impact of future disasters on lives and livelihoods. Because PCMMA is still a relatively new approach, the IRC has devoted resources to conducting three pilot PCMMA assessments in disaster-prone countries in 2015 in order to generate learning that can be used to refine the approach and the PCMMA guidance manual, while also informing the strategic and operational emergency planning efforts of humanitarian actors in Pakistan. This PCMMA exercise additionally served as an opportunity to build the capacity of humanitarian practitioners to carry out market analyses in humanitarian contexts.

The PCMMA analysis is based on comparing a baseline level of market functioning to the level of market functioning during an emergency, in order to anticipate how markets will be impacted in future emergencies. During this exercise, the baseline was established as August 2014, which was deemed a "normal" year, just before the onset of seasonal flooding. The emergency-affected market scenario was defined as the worst-case flood scenario in the three districts, which for Badin and Sanghar was agreed to be September 2010, and for Ghotki September 2011. The PCMMA team compared how market systems were functioning during the 2010/2011 flooding with how they functioned in August 2014 to model how markets will respond during future flooding. The resulting analysis is intended to provide evidence and information to help determine programming options in advance of an emergency. The recommendations of this analysis are based on market functioning, and would need to be further informed by operational feasibility and needs assessments following the onset of an emergency.

In summary, the specific objectives of the Pakistan PCMMA exercise were:

1. **Emergency response -** To recommend the most appropriate market-sensitive programming options (including both direct assistance to the affected population and indirect assistance to market actors) to respond to monsoon season flooding.

2. **Preparedness / DRR -** To identify program options to strengthen markets and address potential constraints in access or availability of essential items during floods.

3. **Capacity building -** To strengthen skills of humanitarian actors in Pakistan to conduct market analyses before and after emergencies.

[1] Available at http://emma-toolkit.org/practice/pre-crisis-market-mapping-and-analysis/

4. **To learn about the PCMMA approach itself -** to capture learning about the PCMMA approach in order to inform revisions and improvements to the PCMMA guidance manual.

Methodology

This analysis exercise followed the PCMMA guidance to apply an approach similar to that of the Emergency Market Mapping and Analysis (EMMA) Toolkit in a pre-crisis context. The EMMA toolkit is a mixed methods (qualitative and quantitative) approach that is based on 10 logical steps and is designed for non-specialists to rapidly conduct market assessments in a quick and low-cost manner. The approach includes three "strands" of analysis, including a gap analysis to understand the material needs at household level, a market analysis to evaluate the capacity of the market to respond to those needs, and a response analysis to identify appropriate options for programming.

The PCMMA took place from 18 May to 1 June 2015 in Sindh, Pakistan, covering three districts – Badin, Ghotki and Sanghar. The exercise was hosted by the IRC, with participation from eight other organizations – HWA Foundation, Takhleeq Foundation, RWF, Care, ACTED, ACF, Concern Worldwide, WHH and Oxfam. The three districts of the assessment were selected based on (1) Geographic coverage of the north, central and southern parts of Sindh; (2) Proximity to partner agency offices to support the assessment teams; and (3) Having been seriously affected during the 2010/11 floods. In total, 18 national and 3 expatriate staff participated in data collection and analysis, including intensive mentoring support to 4 critical market team leaders. A training workshop was held at the beginning of the exercise from 19-21 May in order to introduce the PCMMA approach, train team members in market analysis and prepare fieldwork activities. This workshop was followed by 7 days of intensive field-level data collection in each district and a 3-day analysis workshop to review and analyze the data.

Data was collected from key informants and market actors using semi-structured interview tools and from communities through detailed focus group discussions and household interviews. For the water market system portion of this exercise, the sample included 20 households, 25 market vendors and 4 focus groups, as well as a number of key informants. Qualitative and quantitative data was inputted into databases for each critical market system on a daily basis and shared with the other districts to coordinate data collection efforts across districts.

The size and scope of this exercise, in terms of the geographic areas of coverage, the number of team members and the number of critical market systems studied, were quite ambitious, especially considering that this was a pilot study. In one sense, this breadth was extremely positive, as it reflected a strong interest in market assessments among a range of humanitarian actors in Sindh. However, it also made it difficult to allocate appropriate time to each of the study's four objectives. In addition, few of the team members, team leaders included, had any prior market analysis experience, which meant that leaders were learning key concepts and the methodology alongside the people they were leading. Finally, the assessment leaders were not always able to provide in-person support to the field team because of the geographic spread of the study (3 districts for 2 assessment leaders) and because of security concerns. Though a good effort has been made to discuss outstanding questions and clarify key findings with the field team, all of these factors had implications for the quality of data and the resulting analysis.

II. Crisis scenario

Severe floods recur on a regular basis in Pakistan; the country has experienced 12 particularly destructive flood years since its independence in 1947. Flooding of some form affects parts of the country almost every year, normally during the late monsoon months of August and September, and it is anticipated that climatic changes may mean floods of greater frequency and destructive force in the future. The consecutive flood years of 2010 and 2011 were the worst floods to date, affecting 20 million and 9.3 million people, respectively, throughout the country.[2]

Due to its flat topography and its location at the bottom of the Indus River basin, Sindh Province is particularly vulnerable to riverine floods, triggered by heavy monsoon rains. According to Pakistan's National Disaster Management Agency (NDMA), Sindh faces the added challenges of a lack of protective infrastructure or integrated flood management and inadequate awareness about monsoon hazards and responses among the vulnerable members of the population.

The 2010/11 floods led to loss of life and also damaged standing crops, household and livestock food stocks, health, education and road infrastructure, houses, irrigation and drainage facilities and protected drinking water sources. Millions of people were displaced for several months or more while waiting for the flood waters to subside. Unless there are major changes to protective infrastructure, it is likely that a similar flood in the future will have a similar impact.

The 2010/11 floods saw a massive humanitarian response in Sindh that spanned all of the usual emergency sectors, like shelter, food security, WaSH, health, education and nutrition.[3] The government of Pakistan and a multitude of Pakistani NGOs led the initial response and was later joined by the international humanitarian community. The government drew some criticism for restricting when, where and how NGOs could intervene; notably for this assessment, it sometimes discouraged NGOs from distributing unconditional cash grants to flood-affected people.[4] While some NGOs did utilize CTPs to deliver food assistance, the vast majority of the assistance provided was done in-kind. Sindh Province was and continues to be served by a range of humanitarian actors, including the nine agencies involved in this assessment and many more.

In response to the 2010/11 floods, the NDMA developed a contingency plan in an effort to be better prepared for such events in the future. In the plan, authority for all aspects of flood preparedness, including risk assessment, resource mapping and deployment, is delegated to the district-level authorities; however, at the provincial and district level it is not clear to what extent these measures have been undertaken.[5]

For the purpose of this PCMMA assessment, the floods of 2010 (for Ghotki) and 2011 (for Sanghar and Badin) were selected as the reference crises. Although less severe floods happen more regularly, it was decided to focus on a worst-case scenario, both because the impacts of the floods throughout our districts

[2] http://www.ndma.gov.pk/Documents/Contingency_Plan/2012/CP_NDMA.pdf
[3] http://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/assessments/ACF_Nutrition_Causal_Analysis_Pakistan_2012.pdf
[4] https://www.oxfam.org/sites/www.oxfam.org/files/bn-pakistan-floods-emergency-16-02-12-en.pdf
[5] http://www.ndma.gov.pk/Documents/Contingency_Plan/2012/CP_NDMA.pdf

of focus were more evident during such a scenario and also because our conclusions about the market's capacity to deliver needed humanitarian assistance would err on the conservative side and be applicable even to less severe flood scenarios. This decision is consistent with NDMA's choice to utilize the worst-case scenario as the basis for its contingency plans.[6]

III. Scope of the assessment

Critical market systems

During the preparatory phase of this study, the IRC's team in Pakistan prepared a list of categories of goods and services that are crucial for the survival and livelihoods of vulnerable people in Sindh and that were heavily impacted by the 2010/11 floods. This list included staple foods; other agricultural commodities like fruits and vegetables; construction materials; livestock and livestock fodder; drinking water; daily labor (on farm/ off farm) and non-food items like soap, storage containers and buckets.

The IRC then consulted with representatives of agencies with which it partners via the PEFSA consortium[7] and the senior team members of the agencies participating in the assessment. The group identified specific commodities for each of the categories on the list and agreed upon a set of criteria to help determine which critical market systems to focus on in this study: (1) Critical to save or sustain lives of vulnerable people in the affected areas; (2) Significantly impacted during past floods; (3) Relevant to the expertise and past activities of participating organizations. Based on these criteria, the group identified the critical market systems listed in the table below. These were validated by assessment team members during the pre-assessment workshop.

Table 1: Critical Market Systems Selected for the PCMMA

Badin	**Ghotki**	**Sanghar**
Rice	Wheat flour	Wheat flour
Wheat straw	Wheat straw	Wheat straw
Drinking water	Drinking water	Drinking water

Separate reports have been produced for each of the critical market systems assessed in Sindh in 2015. This report focuses only on drinking water.

Key Analytical Questions

In accordance with the EMMA approach, the assessment team developed and approved a set of key questions that guided the field research and analysis. The questions were the same for all of the critical market systems. These questions are answered at appropriate points in the analysis and recommendation sections of this report.

1. How is the critical market behaving today, and how will it behave during the flood emergency?
    a. Is it supplying the appropriate volume/quality of goods?
    b. Is it integrated and competitive?
    c. To what extent can it respond to an increase in demand?

[6] http://www.ndma.gov.pk/Documents/Contingency_Plan/2012/CP_NDMA.pdf
[7] Pakistan Emergency Food Security Alliance, including ACF, ACTED, Care, IRC, Oxfam and Save the Children

2. Will the affected population be able to continue to access the needed volume and quality of goods from the critical market system during the emergency?

3. What are the appropriate market-sensitive programming options to meet the needs of the affected population for each critical market system?

4. What are the most appropriate ways to reduce the possible impact of future floods on the market system and on the target population's access to markets?

IV. The focus population and locations

Aside from its manufacturing and financial centers near Karachi, Pakistan's Sindh Province is largely agricultural, growing rice, wheat, cotton, sugarcane, bananas, mangos and animal fodder. Though the province as a whole produces more agricultural goods than it consumes, the productivity of agriculture varies enormously by district, and 75% of Sindh's districts are actually deficit producers.[8]

Although 80% of Sindh's population engages in farming, less than 64% actually own land. The poorest people work as either daily laborers (including many near the coast who work as fishermen) or as sharecroppers, many of whom live in perpetual debt to their landlords. Most of those who own land are relatively poor themselves, with only a few acres of land of their own and sometimes additional acreage that they rent from landlords. Other development indicators for the province are quite stark; only about half of its youth attend primary school,[9] 50% of the population practices open defecation, and chronic malnutrition affects more than half of all residents.[10]

Figure 1: Districts of focus within Sindh Province (map courtesy http://www.sindh.gov.pk/)

This PCMMA exercise focused on three districts of Sindh - Sanghar, Ghotki, and Badin (see Figure 1). The target population for this study was the flood-affected population in the three districts, totaling an estimated 359,000 households. Livelihoods comprise a combination of field crop production (wheat or rice), cash crops (cotton and

[8] http://practicalaction.org/docs/emma/EMMA-Pakistan-Sindh-report.pdf
[9] http://tribune.com.pk/story/759232/international-literacy-day-only-half-of-sindh-goes-to-primary-school/
[10] http://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/assessments/ACF_Nutrition_Causal_Analysis_Pakistan_2012.pdf

sugar cane), and livestock rearing. Non-agricultural wage labor is also a significant income source for many, particularly the very poor and poor wealth groups.

The main underlying factors affecting the choice of water source available to the focus population are location (rural v. urban) as well as relative wealth of each household. Those who reside in urban and peri-urban areas, an estimated 20% if the population in the three assessed districts, have different options to access drinking water, including municipal water schemes, private or public water plants, and different water delivery options. In contrast, rural populations rely almost exclusively on springs, wells, hand pumps or open water sources for drinking water. Among the rural population, only the wealthy households access drinking water from water filtration plants.

Table 2: Focus population for the PCMMA Assessment

Focus Population	Focus Population Sub-group	Number of households	Locations
Flood-affected populations of Ghotki, Sanghar and Badin	Flood affected rural population	274,000	Sanghar: 55 of 55 UCs affected in all 5 tehsils[11]
	Wealthy flood-affected rural population (4% of rural population)	11,000	Ghotki[12]: 9 of 40 UCs affected in 2 of the 5 tehsils
	Urban flood-affected population (20% of total flood-affected population)	71,000	Badin: 46 of 46 UCs affected in all 5 tehsils[13]
	Total Affected Population:	**356,000**	

Seasonal Calendars

Seasonal considerations also affect the choice of water source for much of the flood-prone population in Sindh. The below seasonal calendar illustrates the key seasonal factors which affect the availability and access of the focus population to the different sources of drinking water.

[11] http://pakresponse.info/LinkClick.aspx?fileticket=tykxtL2ZgHU%3D&tabid=98&mid=722

[12] TEHSIL UBAURO: Ranvti, Wasti Jeewan Shah, Langho and Pakka Chandio; TEHSIL GHOTKI: Qadirpur, Hussain Beli, M. Khan Ghoto, Baghoo Daho and Umar Daho. http://www.itacec.org/document/flood/hwa/Ghotki%20area%20profile.doc.pdf

[13] http://pakresponse.info/LinkClick.aspx?fileticket=n7bD1mwkJV0%3D&tabid=98&mid=722

Figure 2: Seasonal calendar, drinking water, Badin, Ghotki and Sanghar Districts

Water Seasonal Calendar (Ghotki, Sanghar and Badin)												
Source of Water (color indicates availability)	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Protected Sources (Handpump, springs, wells)												
Water supply schemes - urban (Sanghar and Badin only)												
Water supply scheme - rural												
Unprotected source (Rivers/canals/ ponds) Water availability	Sanghar canal is off				Low level	Dry						
Water filtration plants are functioning /available												
Flood water is used as drinking water (emergency only)												
Water tanker/aid by NGO (only emergency)												
Other factors affecting Water Markets												
Heavy rains/Floods - Badin and Sanghar												
Rains - Ghotki												
Floods - Ghotki												

V. Market-system maps and analysis

In Sindh, water is generally available as a public good, so the term 'market' is not entirely applicable to the water distribution systems. In most rural communities, water is freely available from dug wells, hand pumps, or open water sources, and in urban areas it is often available through boreholes or municipal distribution schemes. However, a new form of businesses that provide filtered, bottled water at a cost is emerging. As such, this study adopts a systems analysis approach to understanding the sources, delivery channels, and factors that affect how flood-affected populations access water, regardless of whether it is a commodity bought and sold (such as bottled water), or a freely available community resource (such as water from a hand pump).

Baseline Water Market System – August 2014

The majority (approximately 80%) of the flood-affected population live in rural areas and rely mainly on drinking water from protected sources like hand pumps, wells and springs. However, about 20% of the

rural population are collecting drinking water from unprotected sources like rivers, canals and ponds. A very small proportion of the rural population (approximately 4%) is wealthy enough to either have their own hand pump or commission water to be transported from filtration plants and stored on their property. Only large-scale landowners procure bottled water.

In urban areas, the majority of the population are connected to the municipal water schemes, which provide chlorinated water. It seems that for quality reasons a large number of people prefer to collect water from filtration plants or buy bottled water.

The main sources of water during this time are:

Protected water sources (hand pumps, wells): As mentioned, the rural population in the three districts depend mainly on 2 sources of drinking water: hand pumps and dug wells. Water from these sources is free of charge. According to relevant authorities and community members, this water is also safe to drink, and it is preferred by the rural population. Generally each village has a sufficient number of hand pumps and/or wells to meet needs of the population. However, unprotected water sources (canals, rivers, etc.) are often nearer to households, and the focus population quickly switch from protected water sources to open water for drinking if protected water points are too far away, if hand pumps break down, or during the dry season if hand pumps dry up, as often happens between June and August. Although the communities are aware of various ways of treating water, the majority of the population is not practicing any water treatment methods and report high rates of water-borne illnesses.

Figure 3: Unprotected water source, hand pump not functional, livestock using the same source

Unprotected water sources (rivers, canals, ponds): Due to a lack of functional hand pumps, about 20% of the rural population relies on unprotected water sources such as rivers, canals and ponds. Rivers are the preferred source, but if a pond or canal is closer to the village, people sometimes use it regardless for convenience's sake. Since livestock use the same source, and open defecation is practiced by most rural people, this water is at high risk of being contaminated. Again, the population generally does not practice any water treatment.

Water supply schemes (mainly urban): The majority of the urban population gets drinking water from municipal water supply schemes. The water is chlorinated and piped to the households. Maintenance of the piping system is inconsistent, and leakages are very common. The price for piped water is 300 PKR per annum. Since the quality is not always the best, more and more people are seeking drinking water from filtration plants or buying bottled water.

Water filtration plants (mainly urban and peri-urban): Since the floods of 2010/11, a large number of water filtration plants have been installed throughout the three districts. These plants mainly serve the urban and peri-urban population. In Badin, the average capacity of these plants is 15,000 liters/day. In Badin, the government is financing "Pak Oasis" water filtration plants and the water is free of charge. Consumers usually collect water in jerry cans with their motorbikes or cars. Some small transporters (with donkey carts) deliver water in urban areas. Larger transporters (i.e., tanker trucks) are not allowed to get water from these plants.

Figures 4 and 6: Water Filtration Plant (Pak Oasis), Badin

A project between the Government of Sindh and Pak Oasis has started to provide safe drinking water to the villages of Sindh. The project is to be executed in 3 phases and is most advanced in Badin and Tharparkar Districts to date. "Phase 1 includes 500 plants, and Phases 2 and 3 each include 750 plants. These plants are small, with a capacity of 15,000 gallons per day to meet the day-to-day requirements of 2000-3000 people. In phases 2 and 3, the project will function on solar energy due to the shortage of electricity in villages"[14]. The plants are run by local villagers who are trained and paid, thereby giving ownership to the villagers and providing jobs to the locals. Villagers get the filtered water for free.

Bottled water: There are many bottled water producers in Pakistan, international companies like Nestlé and Aquafina and several local producers. Bottled water in Pakistan is under severe pressure. According to a recent report by the Pakistan Council of Research and Water Resources (PCRWR), 19 national brands of drinking water were unsafe in 2014, 13 of which were found to contain arsenic, according to the standards set by the Pakistan Standard Quality Control Authority (PSQCA). The research also revealed that five brands of bottled water showed

[14]http://www.pakoasis.com.pk/project_info.php?id=1&projectname=SID%20P750&detail=(Special_Initiative_Department)

microbiological activity. Hence, consumers looked for quality brands and their trust in bottled water was shaken.

Bottled water is produced for approximately PKR 12.51 for 1.5 liter; **retailers** sell a 1.5 liter Bottle for 50 PKR to consumers. Generally producers located in major manufacturing hubs of Pakistan distribute bottled water through similar channels as other bottled drinks, through distributor networks who deal with only one brand, to **wholesalers** who carry a variety of beverage brands. Wholesalers sell bottled water to retailers. Some local water filtration plants also bottle water in 1.5 or 19 liter containers, and sell to retail stores locally or directly deliver to customers.

Figure 7: Bottled Water plant

In addition to these sources of water, there are a number of transport providers and middlemen who connect the produced water to the different user categories. The water transportation systems in the 3 assessed districts involve a variety of actors with very limited capacities. The types of water transporters that make up the market are as follows:

Transporters owning water bowsers: A few bowsers are available in Badin and Shangar; in Ghotki district only one truck with water delivery capacity was identified, and this was a municipal fire engine. During "normal" times, water is rarely trucked; as mentioned, only a handful of large-scale landowners and companies have water trucked to their premises. Water trucks usually fill up at urban water schemes and base their prices on the transport costs. The capacity of a typical tanker ranges from 3000 to 12,000 liters, and the cost for the delivery of a load within urban and peri-urban areas is 500-1500 PKR, depending on the distance.

Government trucking (fire engines, tankers, etc.): Government bowsers are mainly fire engines and in normal times are not used for drinking water trucking.

Small scale transporters (donkey carts and small trucks/pick-ups): A number of small-scale transporters deliver drinking water to households in urban and peri-urban areas who live close to water filtration plants. Donkey cart owners fill 20 Liter jerry cans and deliver them to customers up to 2-3 Km from water plants for approximately 20-25 PKR/ jerry can in urban areas and 30-35 PKR in peri-urban and rural settlements.

Emergency-Affected Situation – September 2010/2011

After the floods in Sanghar and Badin in 2010 and in Ghotki in 2011, a number of changes occurred in the water market system:

- **Shift in source of drinking water:** Approximately 50% of the protected water sources in rural Sindh were either no longer accessible or damaged. People who found refuge on higher ground near their villages were cut off from protected water sources and relied on flood water as a source of drinking water.
- **NGOs and government agencies hired water bowsers** to deliver drinking water to the flood-affected population. Unfortunately, the **very limited number of available water bowsers** resulted in higher prices for delivered drinking water, by as much as 100%. Additionally, roads and bridges were blocked by flood water, in some cases making it impossible to reach affected communities.
- **Bottled water was available in large quantities** from distributors as well as wholesalers and retailers. Due to infrastructural damage, bottled water could not be delivered to some of the flood-affected areas. Charity organizations, bottled water distributors and government actors initiated bottled water distributions at large scale.
- The main problem for rural people during floods is **access to protected water sources and access to transport routes that facilitate the transport of water to villages.**

How the market will perform in future flood emergencies

Based on the current water market situation and the performance of different water market actors in 2010/2011, water markets are likely to perform in the following manner in future flood emergencies:

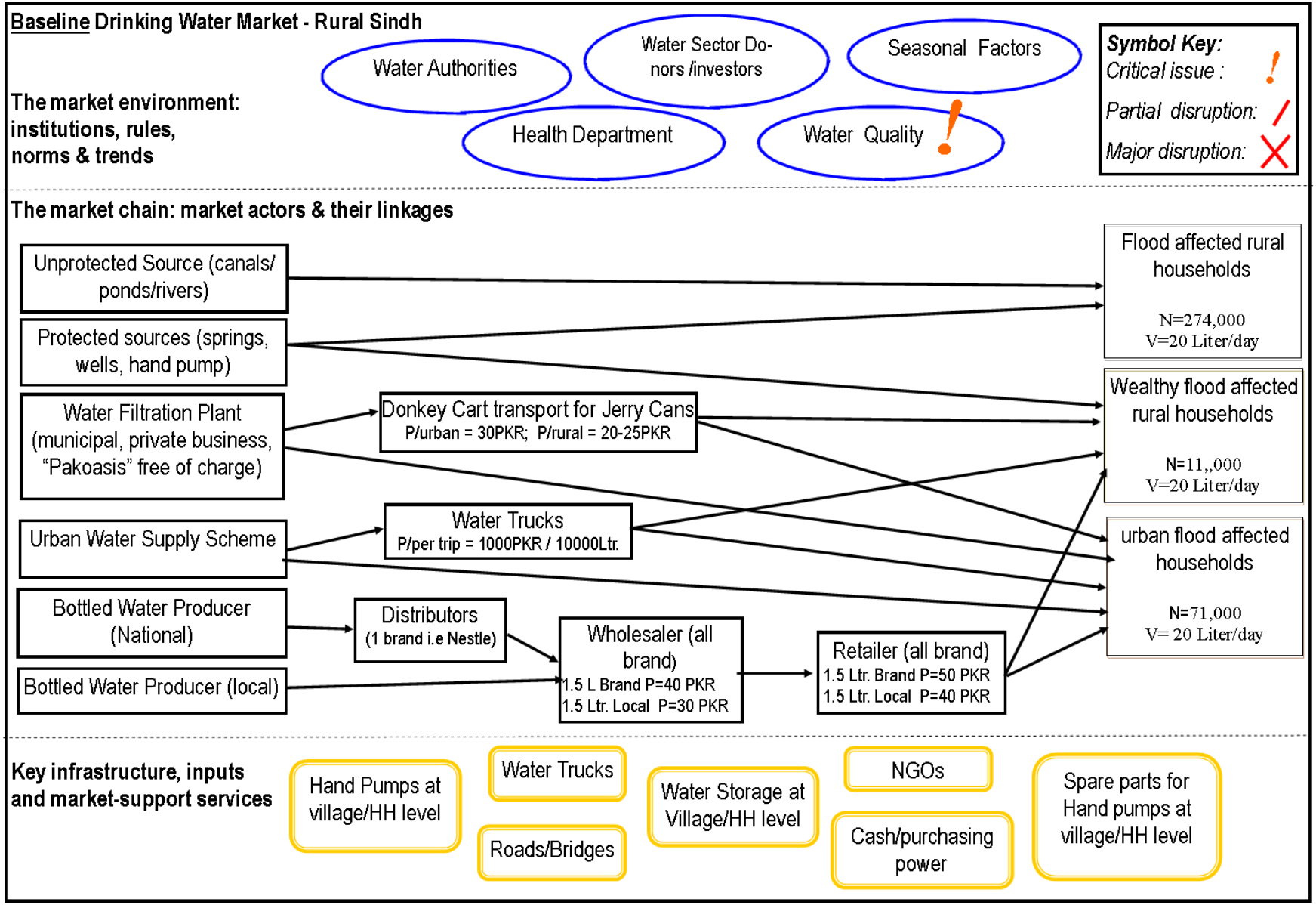
- **Unprotected water sources will likely be the main source of drinking water** for most of the rural population in future floods. The supply of water from protected water sources will still be significantly affected in future floods. Despite the efforts of many NGOs following the 2010/2011 floods to install new or repair existing hand pumps, the majority of protected water sources will still be damaged or contaminated by the flood waters. Unprotected water – including flood waters – will likely be the primary alternative source of water for affected communities.
- **Water quality will be a major concern.** Despite the high degree of knowledge throughout the assessed communities regarding water treatment methods, few households acknowledged actually treating water. As such, the quality of drinking water and accompanying water-borne illnesses will continue to be a major concern during flood emergencies.
- **Increasing importance of water filtration plants in emergencies:** Since 2010/2011, the growth in water filtration plants means that greater volumes of drinking water and bottled water are available closer to the affected populations. Some of these filtration plants will be affected by future floods, but many will be able to continue functioning, and can increase the volume of production. These filtration plants will be a primary source of water for aid agencies distributing bottled, or potentially even tinkered, water to affected communities.
- **Water trucking equipment will be very limited**. There is a limited number of water tanker trucks available in the districts assessed. Some trucking providers increased their prices for water

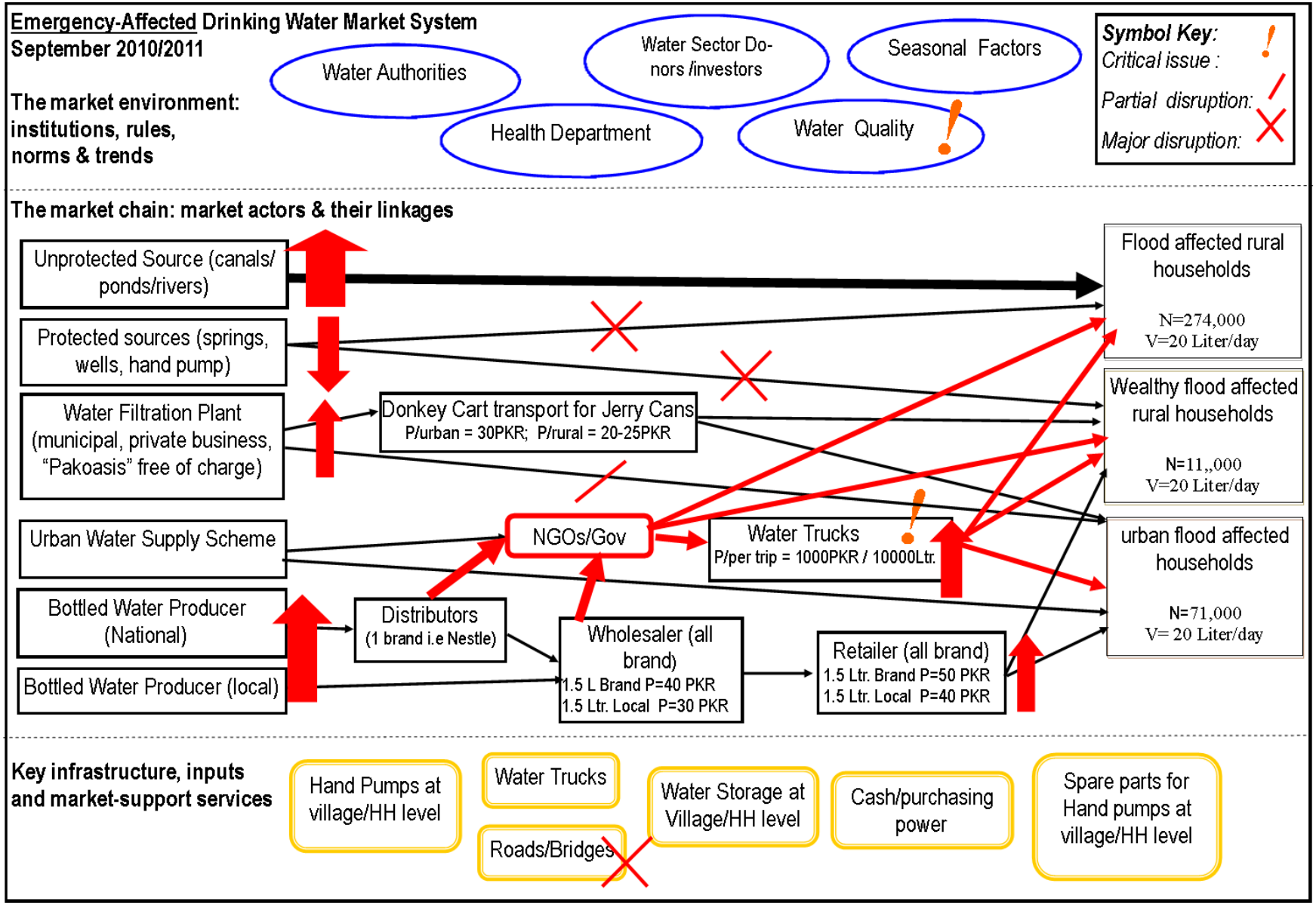
trucking during the last floods by up to 100% due to the high demand and limited equipement available, and are likely to do so again in future.

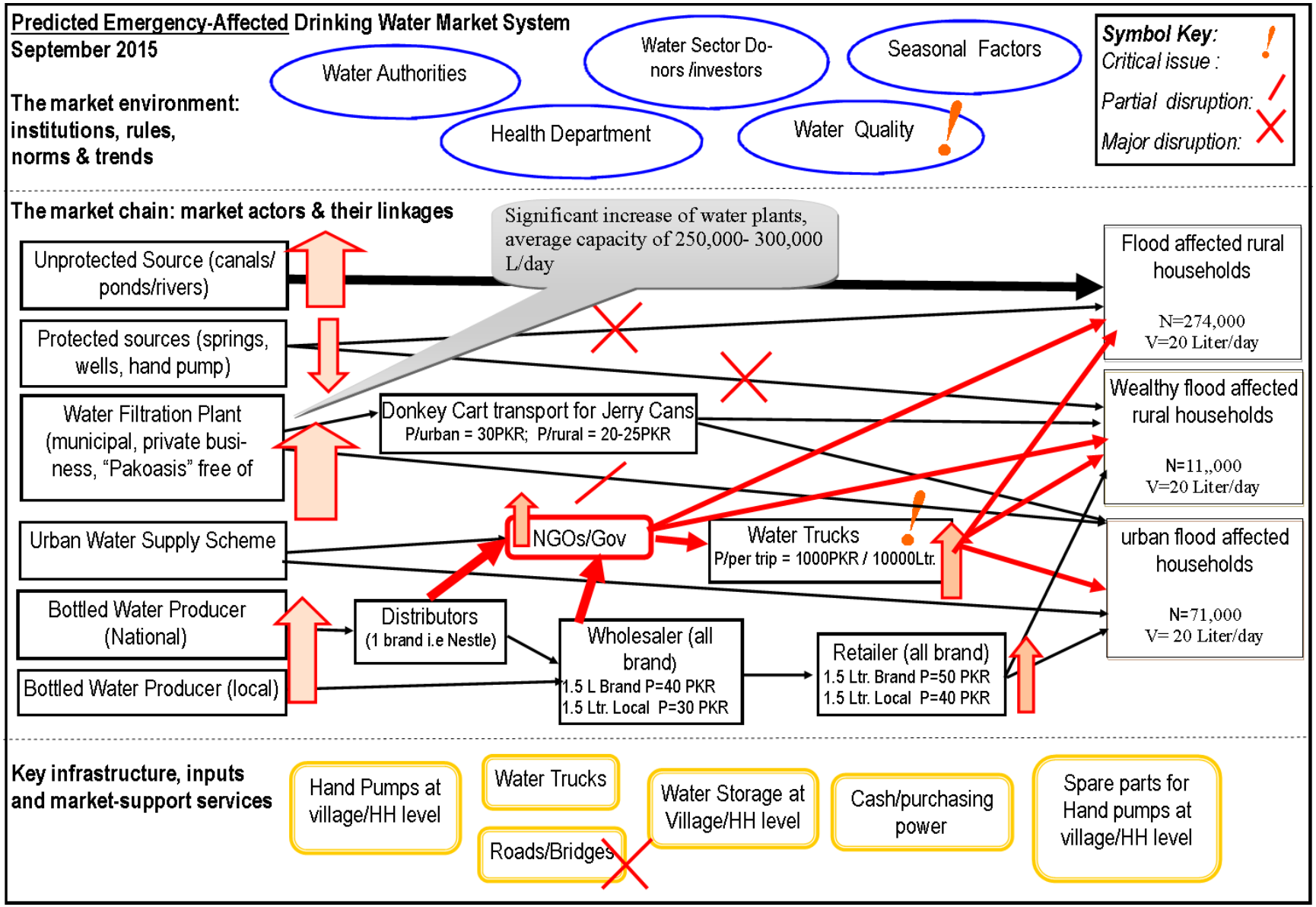
- **Roads, bridges and transportation networks are likely to be affected** for 1-2 months, inhibiting large-scale water trucking services. Smaller-scale bottled water distribution may be feasible by boat, but water trucking will be limited by road accessibility.
- **Bottled water is likely to remain available and accessible**. Prices for bottled water are stable and will most likely remain the same even during future floods. Production rates of bottled water are significant, and manufacturers can vastly increase scale to meet the demand. Additionally, bottled water is likely to remain available at district-level markets, wholesalers, and retailers in larger towns despite the flooding of roadways.
- **Many INGOs and national NGOs have pre-positioned WASH NFI** like water bladders and jerry cans. Some even have water bowser trucks or trailers. Water bladders can be put on flatbed trucks and function in future floods as water transporters.

Key Analytical Question #1: How is the critical market behaving today, and how will it behave during the flood emergency?

In normal years, the drinking water market provides sufficient volume of water, although there are concerns about water quality stemming from consumer practices and the consumption of water from unprotected sources. During emergencies, despite the significant damage to the main sources of drinking water, alternative sources of water, including bottled water and newly growing water filtration services, can scale up the supply of water during crises. However, the main constraint to the increased provisioning of water is damage to transportation infrastructure. Both the price of water and number of business actors involved in water supply suggest a competitive market environment, both for water filtration plants and for bottled water companies.


Baseline Drinking Water Market - Rural Sindh
The market environment: institutions, rules, norms & trends
Water Authorities
Water Sector Do-nors /investors
Seasonal Factors
Health Department
Water Quality
Symbol Key:
Critical issue :
Partial disruption:
Major disruption:
The market chain: market actors & their linkages
Unprotected Source (canals/ ponds/rivers)
Protected sources (springs, wells, hand pump)
Water Filtration Plant (municipal, private business, "Pakoasis" free of charge)
Urban Water Supply Scheme
Bottled Water Producer (National)
Bottled Water Producer (local)
Donkey Cart transport for Jerry Cans
P/urban = 30PKR; P/rural = 20-25PKR
Water Trucks
P/per trip = 1000PKR / 10000Ltr.
Distributors
(1 brand i.e Nestle)
Wholesaler (all brand)
1.5 L Brand P=40 PKR
1.5 Ltr. Local P=30 PKR
Retailer (all brand)
1.5 Ltr. Brand P=50 PKR
1.5 Ltr. Local P=40 PKR
Flood affected rural households
N=274,000
V=20 Liter/day
Wealthy flood affected rural households
N=11,,000
V=20 Liter/day
urban flood affected households
N=71,000
V= 20 Liter/day
Key infrastructure, inputs and market-support services
Hand Pumps at village/HH level
Water Trucks
Roads/Bridges
Water Storage at Village/HH level
NGOs
Cash/purchasing power
Spare parts for Hand pumps at village/HH level


Emergency-Affected Drinking Water Market System
September 2010/2011
The market environment: institutions, rules, norms & trends
Water Authorities
Water Sector Do-nors /investors
Seasonal Factors
Health Department
Water Quality
Symbol Key:
Critical issue :
Partial disruption:
Major disruption:
The market chain: market actors & their linkages
Unprotected Source (canals/ ponds/rivers)
Protected sources (springs, wells, hand pump)
Water Filtration Plant (municipal, private business, "Pakoasis" free of charge)
Donkey Cart transport for Jerry Cans
P/urban = 30PKR; P/rural = 20-25PKR
Urban Water Supply Scheme
NGOs/Gov
Water Trucks
P/per trip = 1000PKR / 10000Ltr.
Bottled Water Producer (National)
Bottled Water Producer (local)
Distributors
(1 brand i.e Nestle)
Wholesaler (all brand)
1.5 L Brand P=40 PKR
1.5 Ltr. Local P=30 PKR
Retailer (all brand)
1.5 Ltr. Brand P=50 PKR
1.5 Ltr. Local P=40 PKR
Flood affected rural households
N=274,000
V=20 Liter/day
Wealthy flood affected rural households
N=11,,000
V=20 Liter/day
urban flood affected households
N=71,000
V= 20 Liter/day
Key infrastructure, inputs and market-support services
Hand Pumps at village/HH level
Water Trucks
Roads/Bridges
Water Storage at Village/HH level
Cash/purchasing power
Spare parts for Hand pumps at village/HH level


Predicted Emergency-Affected Drinking Water Market System
September 2015
The market environment: institutions, rules, norms & trends
Water Authorities
Water Sector Do-nors /investors
Seasonal Factors
Health Department
Water Quality
Symbol Key:
Critical issue :
Partial disruption:
Major disruption:
The market chain: market actors & their linkages
Significant increase of water plants, average capacity of 250,000- 300,000 L/day
Unprotected Source (canals/ ponds/rivers)
Protected sources (springs, wells, hand pump)
Water Filtration Plant (municipal, private busi-ness, "Pakoasis" free of
Donkey Cart transport for Jerry Cans
P/urban = 30PKR; P/rural = 20-25PKR
Urban Water Supply Scheme
NGOs/Gov
Water Trucks
P/per trip = 1000PKR / 10000Ltr.
Bottled Water Producer (National)
Distributors
(1 brand i.e Nestle)
Wholesaler (all brand)
1.5 L Brand P=40 PKR
1.5 Ltr. Local P=30 PKR
Retailer (all brand)
1.5 Ltr. Brand P=50 PKR
1.5 Ltr. Local P=40 PKR
Bottled Water Producer (local)
Flood affected rural households
N=274,000
V=20 Liter/day
Wealthy flood affected rural households
N=11,,000
V=20 Liter/day
urban flood affected households
N=71,000
V= 20 Liter/day
Key infrastructure, inputs and market-support services
Hand Pumps at village/HH level
Water Trucks
Roads/Bridges
Water Storage at Village/HH level
Cash/purchasing power
Spare parts for Hand pumps at village/HH level

VI. Comparing the gap in needs with the market capacity

In the baseline period (August 2014), the focus population households are able to satisfy their entire drinking water need. For the purposes of this gap analysis, we estimate that the average household of 7 people will consume 20 liters of water per day (roughly 2.85 liters per person per day, in line with Sphere standards). Assessed communities report accessing at least this much drinking water, oftentimes greater amounts, in the baseline period. Throughout all communities assessed, the *amount* of water available was not a problem; however, the *quality* of water *was* a concern. A proportion of rural households continue to rely on unprotected drinking water sources as a matter of preference or convenience, even if protected water sources are available in the community. As such, in the baseline period, all households in the focus population have adequate availability of and access to protected drinking water sources; however there is ongoing reliance on unprotected water sources at differing times throughout the year for drinking water.

In the flood-affected time period, it is estimated that 50% of protected water sources will be damaged in the affected areas (based on information from the 2010/2011 floods, meaning that roughly 50% of household water requirements will need to be met by other sources in the market system). The summary of the household gap analysis appears in Table 3 below.

Table 3: Gap Analysis, Emergency Period

Focus Pop description	Number of HHs	Household Water Requirement	Amount Available to HHs during floods	HH Short-fall	Total Gap per day	Duration of gap
Average rural flood-affected households	274,000	20 L/day	10 L/day	10 L/day	2,740,000 L	2-3 months
Wealthy rural households	11,000	20 L/day	10 L/day	10 L/day	110,000 L	2-3 months
Urban flood affected	71,000	20 L/day	10 L/day	10 L/day	710,000 L	2-3 months

Based on this analysis, over 3.5 million liters of water will need to be provided to the affected population per day in order to ensure adequate supply of clean drinking water. This estimate takes into account that 50% of drinking water needs will be covered by pre-existing protected water sources (hand pumps, wells) which remain functional during the emergency. As such, in order to prevent populations from relying on unprotected flood water as the main source of drinking water, over 3.5 million liters will need to be provided by water filtration plants, urban water supply schemes, and bottled water producers.

Most households and key informants interviewed said that during the 2010/2011 floods, this household-level gap in water supply was not covered by other drinking water sources in the market system. Instead, most families resorted to drinking unprotected flood waters.

Key analytical question #2: Will the affected population be able to continue to access the right quantity and quality of drinking water during the flood emergency from the sources in the drinking water market system?

It is difficult to quantify the amount of water produced by water filtration plants and bottled water producers in the baseline period, and even less possible to quantify the amount available during the flood emergency. As such, it is not possible with the available data to compare quantities provided by the market to the amount required by the affected population.

However, we can fairly conservatively estimate that the water filtration plants and bottled water producers by some accounts provided over a billion liters of water across all of Pakistan during the 2010 floods alone, which is less than would be required for 1 month of safe water consumption in just the three target districts. With this information, we can fairly conservatively estimate that the water sources in the drinking water market system *cannot* realistically provide the total volume needed to meet the needs of the affected population.

Additionally, with the anticipated limitations on road infrastructure, bridges and transport networks, it is even less likely that market actors or NGOs will be able to move the required volumes of water to those people in need.

As a result, the markets are limited in their ability to provide adequate drinking water to make up for the 50% loss of clean water provided by wells and hand pumps during floods. As such, the only remaining source of water for the affected population remains unprotected sources, principally flood water. To ensure that affected communities can safely consume this water, additional measures and program activities should be implemented to promote water treatment, prepare communities for reduced access to drinking water and pre-position clean water and/or water treatment materials close to the affected populations.

VI. Main Findings

This section summarizes the main findings from the gap analysis and the market analysis as well as the implications of those findings for programs. Table 4 below identifies the main findings of the assessment and organizes them according to the relevant actor in the market system.

Table 4: Key findings and Implications for Programming

Key actors	Findings	Implications for response
Unprotected water sources	Only 50% of water needs can be met through protected sources, and unprotected water will likely be a significant source of drinking water during floods.	• Programming options needed to address water treatment needs so unprotected water can safely be used for drinking. • Market cannot provide all clean water needs, so programming options needed to

Key actors	Findings	Implications for response
	Quality of drinking water is a significant concern – in baseline and even more so during emergency context. Water is available in large amounts in baseline and emergency, but ensuring this water is safe to drink is the crux of the challenge, particularly in emergency context when protected water sources are not available.	increase availability of protected water sources, even during flood times. • Preparedness efforts to pre-position water tanks, or hand pumps on higher ground, etc. may be useful to expand availability of drinking water in affected communities or the areas they are displaced to during floods.
Transportation Providers	Damage to and flooding of transportation infrastructure likely to limit movement of trucks for several months after flooding.	• If local sources cannot provide water, transportation challenges makes delivery of bottled or trucked water even more complex. • Increases the importance of relying on locally pre-positioned water sources, or water treatment materials.
Bottled water providers	Bottled water providers are likely able to scale up production and distribution to district level during flooding, while maintaining similar prices as during the baseline.	• Although it cannot cover the full demand, bottled water is a good option in short term to deliver water rapidly. • Local water filtration and bottling plants may be a viable source of bottled water, and more closely positioned to the affected communities.
Water Filtration Plants	Water plants likely to continue operating during floods, although some plants will not be functional.	• Sources of clean water are available closer to affected populations and may be accessible through vouchers or contracts with the plants to deliver water to affected areas. • Could be a source of water for tanker trucks, if plants accept it. • Local procurement options are available for bottled water. • Local production may alleviate some of transportation issues in early stages of the flooding which prevent bottled water from arriving from other areas.
Water trucking	Limited equipment available in the targeted districts.	• While potentially a feasible programming option, tanker equipment, bladders, trucks, etc. will need to be pre-positioned due to limited equipment available.

VIII. Main recommendations

Recommendations in response to Key Analytical Question 3: What are the appropriate market-sensitive programming options to meet the drinking water needs of the affected population? (see Annex C – Programming Options Matrix to see the long-list of programming options analyzed).

- **Provision of bottled water is appropriate for the first month for both rural and urban areas.**
  During the early phase of emergency response to flooding, distribution of bottled water will be an appropriate response. During this time, many roads will be inaccessible, and bottled water can be an effective means of rapidly providing clean water to affected people. Additionally, with many roads inaccessible, bottled water can more easily be distributed by boat or air to affected areas.

  Bottled water is appropriate because the supply is extremely large throughout Pakistan and production can be increased. Although not commonly used by rural populations, bottled water can serve as a short-term replacement for protected water sources damaged or inaccessible during flooding. However, after the initial emergency response phase (after about 1 month), bottled water will not be appropriate, as other more plentiful and cost-effective water sources, such as tankered water, locally produced drinking water from treatment plants, or water treated at the household level, become available.

- **In rural areas, distribution of filtered/treated drinking water by jerry can or by water tankering will be required.**
  In-kind distribution of drinking water will be necessary in rural areas because existing sources of water will be contaminated or inaccessible. Trucking (tankering) water will likely be the most cost-effective way to delivery large volumes of water to affected areas if roads are accessible. If trucks cannot access affected areas, distribution of filled jerry cans by boat may be an alternative delivery mechanism to reach affected populations.

- **In urban/peri-urban areas, provision of water vouchers for bottled/filtered water.**
  Urban and peri-urban areas have greater access to retailers who sell bottled water as well as water treatment plants that produce bottled water. These markets are expected to be able to match at least their pre-emergency production levels and will likely be able to expand their drinking water production. As such, vouchers for drinking water from these providers will be an appropriate response in urban areas. Additionally, vouchers redeemable at local water retailers and producers will lead to creation of additional distribution networks that will expand the coverage of bottled water distribution during and after the flooding, effectively expanding the number of households consuming high quality drinking water. Water vouchers will be particularly relevant in areas with multiple water filtration plants and large bottled water markets, but in some areas where water filtration plants have not yet been established water vouchers may not be feasible.

Recommendations in response to Key Analytical Question 4: What are the most appropriate ways to reduce the possible impact of future floods on the market system and on the target population's access to markets?

- **Installation of hand pumps in elevated areas where displaced communities take refuge during floods.**
  To expand availability of drinking water sources during floods and reduce the need for humanitarian assistance, NGO and government actors should install protected water sources in elevated areas where people take refuge during floods. Mapping evacuation/displacement areas and improving infrastructure and services available in those locations will effectively reduce the need for assistance and allow affected populations to rapidly and readily access safe drinking water during floods. The cost associated with new hand pump installation will be significantly less than the cost of distributing bottled water or water tankering for several months during emergencies.

- **Pre-position water tankering equipment near affected areas as well as agreements with district-level water treatment plants or water sources to fill tankers.**
  NGOs and government actors should pre-position water trucking equipment near anticipated flood-affected areas, as well as agreements with district-level water filtration plants and water suppliers in order to fill tankers. Because water tankering equipment is scarce in the districts studied, NGOs and government actors will need to identify and bring in their own equipment to affected areas. Doing so before the emergency strikes will speed up the response and enable a more rapid and cost-effective transition from distributing bottled water to trucking tanked water.

- **Pre-position agreements with water treatment and bottled water retailers in urban or peri-urban areas to accept vouchers for drinking water during floods.**
  In urban and peri-urban areas, where water filtration plants exist or where there are large numbers of bottled water retailers, it will be necessary to pre-position agreements with filtration plants and retailers to accept vouchers when flooding happens. Conducting vendor assessments, setting targets for the number of beneficiaries to reach and signing contracts with filtration plants and/or retailers will all enable these market actors to plan for increasing their volumes of drinking water to supply the volumes needed by the affected populations. Pre-positioning agreements with voucher shops will also speed up the response so that urban and peri-urban populations can access drinking water as quickly as possible from these suppliers.

- **Cleaning, treatment and repair of wells and hand pumps (using CFW) in rural areas.**
  NGOs and government actors should undertake cash for work programs prior to flooding to clean, treat and repair drinking water wells and hand pumps prior to the onset of flooding. This intervention will have the effect of increasing the number of functioning protected water sources before emergencies happen, and will increase the likelihood that there are more protected water sources available and accessible after floods happen. Additionally, the cash for work activity will provide much-needed financial assistance to families which can enable them to better manage

and respond to flooding when it occurs. Overall, this pre-flood activity will reduce the need for emergency drinking water assistance after flooding does happen.

- **Promote household-level water treatment strategies, in normal periods and particularly during floods.**
  Perhaps the most cost-effective way to ensure affected populations have access to safe drinking water is for people to treat water to make it safe for drinking at the household level. NGO and government actors should promote household-level practices to ensure all people consume only safe drinking water, particularly in normal times, a practice which will then carry over into flood times. Promotion of household-level water treatment only during floods will have little effect if not promoted throughout the year. In order for household treatment promotion efforts to be effective, a KAP analysis is needed to better understand water treatment preferences and practices and why even basic water treatment practices are not currently followed.

- **Support growth of private-sector water filtration businesses.**
  Government actors should continue to adopt policies promoting the expansion of private-sector water filtration businesses which compete to provide high quality water at low costs to the urban and rural population. Expansion of filtered water systems to rural areas will be particularly critical in the coming years. NGOs can advocate to the government to support the start-up cost or to subsidize the distribution networks of these filtration plants in order to reach the maximum number of people with locally-produced clean drinking water. These filtration plants, if they perform at baseline capacities during emergencies, will significantly contribute to the needs of the flood-affected populations and reduce the demand for humanitarian assistance. Also, by using water vouchers as a response in areas where filtration plants currently exist, NGOs support these market actors to expand their coverage and distribution of filtered water.

Table 5: Summary of Response Recommendations

Recommendation	Key Risks and Assumptions	Likely effect of the intervention on market system and target group	Appropriate timing of intervention	KAQ
Distribution of bottled water	National-level bottled water manufacturers can expand production almost indefinitely.	Rapidly provide drinking water to affected population; short-term intervention; high-cost of distribution.	Immediately, for 1 month maximum	3
Distribution of drinking water by jerry can or water tankering (rural areas only)	Affected areas accessible by road, boat, air; sufficient water available from groundwater or treatment capacity to provide volumes of drinking water needed.	More cost-effective way of expanding access to clean water in rural areas; roads must be accessible for trucked water; will be able to complement water supply from functioning	Immediately, if communities accessible. Continue until flood water recedes	3

		community-level protected water sources.		
Provision of water vouchers for bottled/filtered water (urban and peri-urban areas only)	Water filtration plants and retailers maintain existing levels of supply, and expand; urban/peri-urban populations can access these filtration plants or retailers.	Utilize existing local market capacity for drinking water; expand coverage of high-quality drinking water during and after the emergencies; affected-population use the same water sources they already know and trust.	Immediately, if accessible. Continue until flood water recedes	3
Installation of hand pumps in elevated areas where displaced communities take refuge	Mapping required to identify areas where populations move during floods; these areas will not flood during future emergencies; wells can be safely installed in these elevated areas.	Cost of mapping and installation will be offset by reduced need for humanitarian response; provide for immediate clean water for affected people.	During normal time, months before onset of floods to ensure adequate time for well installation	4
Pre-position water tankering equipment near to affected areas	Adequate water trucking equipment can be found, and contracted; equipment can be pre-positioned close to likely flood areas; roads will be or will quickly become accessible for water tankers.	Will ensure more rapid delivery of drinking water; reduce reliance on unprotected water sources; speed up emergency response.	During normal time, up to 1 month before flood season	4
Pre-position voucher agreements with water treatment and bottled water retailers in urban or peri-urban areas	There are adequate numbers of water filtration plants or bottled water retailers; these retailers/plants compete on price; they are accessible to urban and peri-urban populations.	Cost-effective water delivery mechanism during emergencies; affected population accesses same water they currently use; expand coverage of the water filtration plants.	1 month before flood season	4
Cleaning, treatment and repair of wells and hand pumps (using CFW) in rural areas	Protected water sources can be safely restored; cash for work will not displace current employment/ volunteer activities.	Will expand the number of protected water points to provide safe water during floods.	During normal times	4
Promote household-level water treatment strategies, in normal periods and particularly during flood	Current blockages to uptake of household-level water treatment can be overcome; material (if needed) for household water treatment is locally available.	Will enable households to have access to safe drinking water during floods; reduce the need for humanitarian assistance; reduce pressure on unaffected protected water sources during floods.	Throughout the year, especially before floods	4
Support growth of private-sector water filtration businesses	Adequate sources of groundwater exist; target population will adopt filtered/ bottled water sources	Will create duration option for clean drinking water; can create cost-effective safe drinking water options.	Throughout the year	4

Annexes

Annex A: PCMMA Team Member List

Name	Organization	Job title	Critical Market Team
Gregory Matthews	IRC	Senior Technical Advisor for Livelihoods	Assessment Leader
Emily Sloane	IRC	Emergency Markets Officer	Assistant Assessment Leader
Muhammad Attiq	IRC	Head of Office, Sindh Province	Markets Focal Point
BADIN DISTRICT			
Juergen Mika	WHH	Emergency Response Coordinator	water - **TEAM LEADER**
Muhammad Ali	ACF	Survey DPM	rice - **TEAM LEADER**
Sajan Dass	IRC	Sr. Training Officer	rice
Waqar Ali	Oxfam	MEAL Officer	fodder
Khalid Khan	ACF	Nutrition Surveys Data Analyst	water
Naseem Khan	Oxfam	DPM EFSL	fodder
Zeeshan Ahmed	ACTED	Community Mobilizer	rice
GHOTKI DISTRICT			
Muzafar Hussain	IRC	M&E Manager	fodder - **TEAM LEADER**
Ayaz Lakho	HWA Foundation	P.O.	water
Hafiz Manzoor	HWA Foundation	CEO	wheat flour
Himat Ali	Takhleeq Foundation	A.C.C.	fodder
Wasim Kolachii	Takhleeq Foundation	District Coordinator	fodder
Asif Imdad	IRC	Database Assistant	water
SANGHAR DISTRICT			
Khan Zada	Concern WW	Cash Project Coordinator	wheat flour - **TEAM LEADER**
Mehar Ali	IRC	Cash Transfer Officer	wheat flour
Nizakat Ali	IRC	Sr. CMO	fodder
Fida Hussain Bozdar	IRC	Community Mobilization Officer	water
Raza Ali Daudpota	RWF	Database Officer	fodder
Umair Said	CARE	FSL Monitoring Officer	fodder

Annex B: Summary of interviews conducted, drinking water market system

Type of interview	Location of interviewee		Number of interviews
	District	Specific locations	
Household	Badin	Seerani (Misri Mandhro, Haji Soomar Goth, Ishaq Mallah, Haroon Samejo); Bhugra Memon (Gaji Mallah); Ahmad Rajo (Ahmad Rajo, Mehar Dandal)	14
	Ghotki	Hussain Behli, Qadirpur, Chandia	5
	Sanghar	not specified	1
TOTAL, Household interviews			**20**
Market actors (vendors, truckers, plant operators, water authorities etc.)	Badin	Badin (Badin city, Cantt Road, Seerani Road); Seerani (Seerani), Kadhan	13
	Ghotki	Mathelo Chowk, Ghotki	3
	Sanghar	not specified	9
TOTAL, Vendor interviews			**25**
Focus Group Discussion	Badin	n/a	0
	Ghotki	n/a	0
	Sanghar	not specified	4
TOTAL, Focus Group Discussions			**4**
GRAND TOTAL, Interviews Conducted (not including key informant interviews)			**49**

Annex C – Programming Options Framework

The Programming Options Framework presents the long list of programming options considered, based on the market and response analysis conducted during the PCMMA exercise. Based on this brainstorming of possible response options, the best options were selected as recommendations and reported in Section VIII of the report.

No.	Programming option	Preparedness or Response Option	Advantages	Disadvantages	Feasibility
1	Water tankering	Response	maxize HH coverage; delivery at door step; easily available	Quality of water may be an issue; subject to poor infrastructure, especially during floods; Limited availability of Tanker Trucks	High
2	Provision of fuel for water trucks	Response	providing support to other stakeholders for better coordination	logistically may be not feasible; other actors to fill this role?	low
3	Provision of Bottled water (in kind)	Response	Safe water to make readily available; ensuring quality; easy accessible	Expensive; logistically heavy; not sustainable over medium term beyond initial rapid response	low
4	Rehabilitation of and pumps and installation	Preparedness and Response	Ensure safe drinking water; easy access at door step of affected Hhs; low cost; high demand	Water quality is not assured; Place/venue selection can be problematic	High
5	Hand pumps maintenance training	Preparedness and Response	skill development of local people, it save the maintenance cost	effect the hand pumps mechanics' business, time consuming	High
6	Water purification/tre atment training	Preparedness and Response	skill development, ensure sustainability for safe drinking water	Time consuming; pre-existing low-uptake of water treatment methods	High
7	Rehabilitation of water ponds	Preparedness and Response	Easy access of water for different purpose of use	Quality issue of water if used for drinking	Medium
8	Rehabilitation of dug Wells	Preparedness and Response	Easy access; safe water	Maintenance may be an issue; ensuring long-term water quality issue	Medium

9	Advocating for increase numbers of water filtration plants	Preparedness	Safe water; ensures quality; reduces diseases	expensive; maintenance issues; would require significant business/government investment	medium
10	Advocating for development of water testing facilities/small testing lab	Preparedness	Ensure safe drinking water; ensure quality	Expensive; Question of management and sustainability of testing practices	Low
11	Provision of WASH NFI (purification tablets, water jerry cans etc.)	Response	Ensure safe minimum storage of water for HH in emergency.	Low uptake of water treatment methods in baseline (although uptake may increase in emergency?); pre-emergency education and behaviour change required	High
12	Support to drinking water access through water vouchers linked to local water vendors/retailers in urban areas	Response	safe water, ensuring quality, easy access.	Would be limited to urban/peri-urban HHs with access to water vendors	High
13	Installation of tapstands connected to pipesystem/or Tanks	Preparedness or Response	Safe access and supply, evn during flood	Could be costly; involve site planning and site management, before emergency. Large community mobilization effort	High
14	Cash for work, cleaning of wells	Response	Ready provision of cash to meet needs; clean wells to supply water	Might be limited to small number of people to benefit from the cfw.	medium

Annex D: TOR for assessment

Pakistan Pre-Crisis Market Mapping and Analysis PCMMA Terms of Reference

Assessment dates: May 18-June 3, 2015

Host agency: International Rescue Committee

Participating agencies: This will be a multi-agency endeavor to which staff from selected NGOs that operate in the assessment area will be invited to participate. Please express interest in participating in this PCMMA by contacting Emily Sloane, Emergency Markets Officer, IRC (Emily.Sloane@rescue.org)

PCMMA Overview and Objectives:

The Pre-Crisis Market Mapping and Analysis (PCMMA) is a practical, step-by-step resource to guide market analysis practitioners and team leaders to conduct market assessments prior to emergencies in order to anticipate how markets will respond after a shock occurs. The PCMMA was developed in 2014 by the IRC and Oxfam with the support of the European Union through the Enhanced Response Capacity Mechanism and the American People through the United States Agency for International Development (USAID), and builds on earlier experiments with market baseline mapping and analysis conducted in pre-crisis settings. Although based loosely on the EMMA methodology, the PCMMA does not replace existing market analysis tools, rather it is intended to provide a guide to applying those tools in pre-crisis contexts, particularly in contexts that are prone to recurring humanitarian crises.

PCMMA is designed to help agencies to improve preparedness, feed into contingency planning efforts and contribute to the design of disaster risk reduction programs by identifying certain parts of market systems which may be vulnerable to shocks. Increasing the speed of emergency responses or strengthening market systems ahead of emergencies would potentially reduce the disaster impact on lives and livelihoods, and begin to address the longer term or chronic nature of poverty and vulnerabilities. As it is still a relatively new approach, the IRC has devoted resources to conducting three pilot PCMMA assessments in disaster-prone countries in 2015 in order to generate learning that can be used to refine the approach and the guidance document, while providing information that can help various humanitarian agencies' strategic and operational planning efforts. The pilots will also serve as opportunities to develop market analysis capacity within the humanitarian community.

In Pakistan, monsoon-related flooding leads to humanitarian crises of varying scale on an almost annual basis, at the bottom of the Indus River basin. Since 2010, flooding has adversely affected at least half a million people *per year* in Sindh Province, located at the bottom of the Indus River Basin. Some years are particularly devastating; 2011 saw almost 5 million Sindh residents affected. Flooding destroys crops, livestock and agrarian infrastructure and in a highly agriculture-dependent region, results in loss of human life and damages homes and public infrastructure. Thus far, markets have by and large managed to continue supplying goods following floods, albeit at inflated prices.

The IRC has actively responded to flood-related humanitarian crises since 2010 in the FSL, WASH and Health sectors, and will continue to do so in the future. In 2010, the IRC participated in a multi-agency EMMA exercise in Sindh with an eye to developing more market-aware programming. This PCMMA will build on that effort to help identify ways to help prepare markets and residents to better withstand floods in the future. This PCMMA will focus specifically on those

markets that are critical for supporting the basic needs and livelihoods recovery of vulnerable Pakistani people whose lives may be disrupted by future flooding.

The objective of the analysis will be to identify appropriate market-based programming options for emergency and longer-term basic needs and livelihood assistance for both IDP and host community populations alike. The analysis will focus on identifying both direct programming options targeting IDPs or host community members as well as indirect responses targeting key market actors to improve capacities to provide basic needs and livelihoods opportunities to IDPs and host community families. The specific market systems to be analyzed during the assessment will be determined based on inputs and level of interest from participating agencies, feasibility of undertaking the analysis and potential programming, and appropriateness to the context in Pakistan. The exercise will further explore ways to better integrate gender considerations in the emergency market assessment process.

Main Objectives:

- To identify through a pre-crisis market analysis appropriate responses to meet early livelihood recovery and other basic emergency needs, with a particular emphasis on market support activities.
- To strengthen the market analysis capacity of both national and international IRC staff and of relevant members of the broader humanitarian community
- To build the IRC's experience in applying market analysis to response analysis and design within contingency planning
- To generate substantive, practical learning on how to integrate gender into market analyses

Desired Results of the PCMMA

- Market Maps of selected critical markets
- Seasonal calendar for critical markets
- Report of key findings and recommendations for each critical market system analyzed
- Brief report on learning related to the PCMMA approach and guidance document and on the integration of gender in market analysis

Key findings and recommendations will be presented widely at the close of the assessment. Presentations by assessment team members at field and Islamabad-level coordination structures will be encouraged, and the final reports will be made available online through the UNHCR Web portal, EMMA website (emma-toolkit.org), and the Markets in Crises Dgroup list serve.

Geographical Area of Assessment

The PCMMA assessment will take place in district and sub-district-level markets in selected areas of Sindh Province that are likely to be affected by future flooding. Specific locations and markets to be assessed will be identified in further consultation with both the country team and the different agencies participating in the exercise.

Critical Markets for Analysis

Due to the logistical, financial, and analytical limitations, the number of critical markets to be analyzed during this exercise will be limited to 3 different market systems. Before the start of the PCMMA, participating agencies will decide

on 2 to 4 critical markets to be the focus of the fieldwork and analysis. The type of critical markets to analyze depends on the sectoral interests of participating agencies and the number of participants available to partake throughout the assessment process. If necessary, different critical markets can be selected for different parts of Pakistan based on the specific market realities in each geographical area.

Potential market systems for analysis include:

- Construction materials
- Manual labor (agricultural and/or non-agricultural)
- Agricultural inputs (e.g., seeds for key crops)
- Staple food items
- Livestock

Assessment team members

The assessment team composition will reflect the fairly ambitious scope of the exercise. The assessment will be co-led by two technical staff from HQ. It is expected that 10-20 additional people will participate in the exercise; these people will be divided into 2-3 sub-teams to analyze the specific market systems identified. Each critical market team will be led by a critical market team leader and a national or expatriate mentee (to be identified by ERD staff). Market team members should have a good understanding of humanitarian programming and basic market principles, analytical and writing skills and experience with field-level data collection. Crucially, a member of IRC's Pakistan country team will serve as a market focal point leading up to and during the exercise; this individual will oversee the country team in preparatory analysis before the assessment and will apply his/her local knowledge to assist guide the assessment design and data analysis and interpretation processes. Finally, a gender specialist from the IRC's HQ will participate in the assessment to ensure that gender-related learning objectives are met.

Each market-specific sub-team will be expected to analyze assessment data and to prepare a draft report of findings and recommendations in line with the PCMMA Methodology (see below). Significant support for this analysis will be offered by the critical market team leaders; however staff or personnel participating in the assessment must be strong in data analysis and capable of writing complete assessment reports independently.

Having previously attended an EMMA training is not a requirement to participate in this assessment, but previous market analysis training or experience is highly desired. The training and facilitation will take place in English.

Agencies interested in participating in the PCMMA are asked identify staff members to be a part of the assessment. Agencies and individual staff must be willing and able to commit to being a part of the PCMMA team for the duration of the assessment, including pre-assessment training, field-based data collection, and analysis stages of the process. Additionally, agencies providing staff are asked to cover the costs of personnel (including salaries, per diems, etc.) and contribute to logistical support for those personnel (communications, vehicles and fuel, field overnights, etc.).

Duration of assessment and working Hours

- 18 days from mid-late May 2015. Please see schedule below.
- Participants should anticipate long working hours and be prepared to work outside normal business hours.

- All participants should agree to work the length of assessment, without a break if necessary to complete the work on time. Team members should expect to work weekends. Please inform us immediately if this is likely to be difficult or if there are any outstanding issues that need addressing.

Methodology

The assessment will use the methodology in the PCMMA guidance document, comprising 15 steps. To the extent possible, Steps 1-6 will be conducted before the full field team assembles in country. While a plan for Step 13 will be outlined during the PCMMA, it will be the responsibility of in-country staff to ensure that monitoring continues after the official exercise ends.

1. *Understanding the context*	Identify the likely crisis scenario; target population needs & profiles
2. *Setting scope and objectives*	Set objectives and operational questions for PCMMA; identify knowledge gaps; ensure relevance of PCMMA
3. *Ensuring managerial and organizational buy-in*	Determine composition of assessment team, including Market Focal Point; identify and confirm availability of in-country resources needed for assessment; secure country team management approval of the exercise and resulting potential response strategies; confirm that results will be integrated into contingency planning
4. *Critical market selection and key analytical questions*	Pre-selection of critical market-systems; identification of draft key analytical questions for each system; select geographic area to be covered by the assessment
5. *Mapping and gathering existing information*	Gather information on selected critical markets, target groups, livelihoods in assessment areas; identify information gaps
6. *Preparing and planning for the market assessment and analysis*	Confirm team composition; develop timeframe and draft agenda; set budget; finalize TOR
7. *Finalizing the frame of the analysis*	Review and validate steps 1-6 with full assessment team; finalize assessment locations with team; identify markets to visit and market actors to interview with team
8. *Preliminary analysis and mapping*	Production of initial profiles, seasonal calendars, maps of the market-system; identification of key informants or leads.
9. *Data collection*	Develop questionnaires; conduct fieldwork activities and regular debriefings
10. *Final mapping*	Finalize baseline & emergency maps, seasonal calendars; description of key features, bottlenecks, constraints
11. *Gap and market analysis*	Comparison of household economic profiles, analysis of priority needs, access and gaps
12. *Selection of response options*	Exploration of response options, cash and other intervention feasibility; response recommendations and their logic
13. *Market monitoring*	Determine different market indicators to monitor; develop monitoring plan

14. Communication of results	Prepare and disseminate results via report and in-person presentation(s)
15. Updating a PCMMA	Conduct follow-up assessments as needed

Communications

Most national staff have local mobile phones, and these will be used during the exercise. Team leaders will be provided with phone credit. International participants will seek the necessary SIM cards and/or will be provided phones by the IRC's Pakistan office as needed. At the start of the field work, all participant mobile numbers shall be collected and shared.

Administration and resources required:

The IRC's ERD unit will cover the cost of international travel and per diem of international IRC staff participants. It will also pay for accommodation of all international participants, including mentees, if IRC expatriate housing is not available. The agencies sponsoring any mentees involved will be responsible for the mentees' international travel and per diem while in Pakistan.

The IRC's Pakistan office will provide logistical and administrative support related to procuring visas, arranging for accommodation, training spaces, food and refreshments for the assessment team and in-country transportation. While the ERD unit has some limited funds available for in-country costs such as training supplies and transportation, these funds are insufficient to cover the full cost of the assessment, and so the country team will be asked to contribute to these needs to the best of its ability. The ERD may request documentation of any financial or in-kind contributions to the assessment from the IRC country team for donor reporting requirements.

Other participating agencies are asked to contribute staff and logistical support to defray the costs of the assessment. In addition to personnel costs (salary, per diems, etc.), the assessment will depend on contributions of vehicles, drivers and fuel from participating agencies to transport personnel for data gathering.

If your agency will be able to provide personnel or logistical support to the assessment, please indicate the level of support available when expressing interest in being a part of the PCMMA. To express interest, please contact Emily.Sloane@Rescue.org.

Tentative Assessment Schedule

Date	Agenda
1 April-16 May	Identification of assessment team; desk research and initial analysis
17 May	Assessment team arrives at training site
18-20 May	Introduction to PCMMA; training on PCMMA in practice; Developing data collection tools and preparing for fieldwork
21-28 May	Data collection at field level – household, market actor, and key informant interviews
29 May-1 June	Preliminary Analysis of field data and development of recommendations
2-3 June	Presentations of key findings and recommendations

Annex E. Household Questionnaire

INTERVIEWER.....INTERVIEWEE.....CONTACT OF INTERVIWEE.....

Name of respondent: **Telephone number:**

1. How many members are you in this household? Male _____ Female _____

2. What are all the different sources of water you use to access drinking water and what is the amount

Baseline		**Emergency**	
Source	**Amount**	**Source**	**Amount**
1:		1:	
2:		2:	
3:		3:	
4:		4:	

3. Which water source do you prefer and why?
   _____

4. Who is your household is responsible for fetching water.

5. How much water do you use per day?

Use of water	**Amount used (in baseline)**	**Amount used (in 2010/2011 Floods)**
Cooking		
Washing		
Drinking		
Others		

6. From when to when do you use each of the water sources mentioned during a normal year? (FILL TABLE BELOW)

Normal Year	J	F	M	A	M	J	J	A	S	O	N	D
Source of water 1:_____												
Source of water 2: _____												
Source of water 3: _____												
Source of water 4: _____												

7. What are the different sources of water per season used during 2011 when area was flooded? (FLL TABLE BELOW)

Emergency Year (2011)	J	F	M	A	M	J	J	A	S	O	N	D
Source 1: _____												
Source 2: _____												
Source 3: _____												
Source 4: _____												

HAND PUMP MAINTANANCE

8. Who installed your hand pump?_____
9. Who is maintaining the hand pump?_____
10. Who is paying for spare parts?_____
11. (if community is paying) How much did you pay for servicing the Pump?_____
12. Are there any broken pump in this community that have not been fixed? If so why has no one fixed them?

13. How much do you pay for a 20 liter jerry can of water? Please indicate cost from different sources

Source	Normal	Crisis/emergency
Source 1 _____		
Source 2 _____		
Source 3 _____		

14. What determines the price of water? _____
15. How do you pay for the water? Cash or on credit? please explain the terms of the credit _____
16. What is your average daily household expenditure? (food, water, fuel, other) _____
17. What challenges do you face in accessing water and how do you cope with them? _____

    _____
    _____
18. Do you think your water is of good quality? Normal _____Emergency _____
19. In the last 2 weeks has anyone in your household been sick from diarrhoea? If yes how many people? _____
20. Do you do anything to the water to improve its quality? Please explain _____

    _____

    _____
21. What do you think should be done to improve access to water (quantity and quality)? In normal times and during floods…

    _____

    _____

Annex F – Semi-Structured Water Authority Interview Guide

1. Number of customers/connections for the Town/City
2. Volume of water supplied per day (is the water enough to meet all demands?), if not what is the deficit?
3. What is the price of water PKR/M3 to individual connections?
4. What challenges are you facing in supplying water
5. During the Floods 2010/11 you had a large influx of displaced people, how did you manage the higher demand for water
6. Did you truck water to Camp and other settlements during the Floods 2010/11?

   A) What was the source of your water then?

   B) How did you ensure quality of water supplied was not compromised,

   C) How many trucks were dedicated to the Camps/Settlements?

   D) What volume was supplied to the Camps/Settlements,

   E) What was the cost of water?

Annex G - Water Market Questionnaire Water Trucking

INTERVIEWER.....INTERVIEWEE.....CONTACT OF INTERVIWEE.....

Questions for the water truckers

Details: Name etc.

1. How long have you been in the water trucking business?.....
   - How many trucks do you own?.....
   - What is the capacity of your truck(s)?.....
   - What did you use them for throughout the year?.....
   - Did you use them for water trucking outside (Town, City)……

2. Who are your water customers during the:
   a. Normal Year and how many?.....
   b. Emergency period of 2010/11 floods and how many?.....
3. How much water did you deliver per day?
   - Normal……..
   - Emergency 2010/11……
4. Where did you get this water from?
   - Normal Year……
   - Emergency 2010/11……..

5. How is the quality of your water?.....
6. Is the water tested?.....
7. If 12. Is YES, by whom (Institution)……

8. a) What is the maximum capacity that you could scale up to?
   c) What factors limited your capacity to scale up if the extra demand exists?
   - Normal Year……
   - Emergency 2010/11……

9. a) How much did you charge for water and on what basis?
    - Normal Year……
    - Emergency ……..

    b) What affects that price? (road, fuel, NGOs)

    ……

10. a) Are you aware of other ways of organizing payment for water e.g. through the provision of water vouchers to consumers? (May need to explain the concept of voucher system). Do you think you could work with this kind of system?

    c) What do you see as the advantages and disadvantages of this type of a system (for yourself and the community)?

11. a) What's the furthest distance that you go to deliver water?
    - Normal……..
    - Emergency …….

    b) Are there any areas that you can't or won't go to?
    - Normal……..
    - Emergency……..

12. How did the emergency affect your business (price, costs, volumes etc)?

13. a) Who are your other competitors in the water trucking market (individuals, groups or NGOs or Govt?
    - Normal Season
    - Emergency

    b) How did you compete or collaborate with them?
    - Normal Season
    - Emergency

14. What are the main problems you faced in your business?
    a. Normal Season
    b. Emergency
15. What motivates you to stay in water trucking business?
16. Are there any laws or regulations that affect your business, if yes how did they affect you?
    a. Normal Season
    b. Emergency

Annex H - Semi-Structured Interview Water Sellers

Name of the Interviewer: Name of Réspondent: Contact #

Location: Date:

Critical market item: BOTTLED WATER	**Business location:**	**Type of market actor :**

Type of information	**Current Situation (baseline)**			**Emergency Situation (2010 floods for Ghotiki ; 2011 floods for Badin and Sanghar)**		
1. Which brand bottled water you sell? How much of each per week?	**Product**	**Quantity**	**Units**	**Product**	**Quantity**	**Units**
	1. 2. 3.	1. 2. 3.	1. 2. 3.	1. 2. 3.	1. 2. 3.	1. 2. 3.
2. What is the selling price for each brand?	**Product**	**Quantity**	**Price**	**Product**	**Quantity**	**Price**
	1. 2. 3.	1. 2. 3.	1. 2. 3.	1. 2. 3.	1. 2. 3.	1. 2. 3.
3. During the 2011 floods, did the selling price change ? why?						
4. If the same level of flooding happens again, do you think the prices will change the same way as 2011 ?						
5. How much of each brand do you have available?						

6. How long will it take you to replace your supply of each item?		
7. How frequently do you need to re-order brand?		
8. Where do you purchase your supply from (who, where?)		
9. Do you have any problems re-stocking your stocks? (Transportation/shortages/ government restrictions/ increased prices, etc.)		
10. When the problem is occured and how do you respond that situation ?		
11. How many customers do you have ? (number of transactions per week) **12. How would you rank a majority of your customers (very poor, poor,rich) (For Retailers)**		

13. Do you provide any of your customers with credit ?		
14. Do you get credit from your suppliers?		
15. Did the emergency affect your customers' demand for Bottled Water		
16. After the flooding, how quickly could you stock-up to provide : **a.) The same quantity of goods as before the emergency?** **b.) Double the quantity?** **c.) Triple the quantity?**	a.) b.) c.)	
17. Would you say that price competition exists in the market?		
18. How many traders are selling similar items in the same local area as you?		
19. Are there any areas nearby that are not getting regular market supplies?		

Notes: