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Preface

Sri Lanka is one of the focus countries in South Asia identified by the Regional Emergency Coordination Advisor project, facilitated by Global WASH Cluster. The RECA project, funded by European Commission Humanitarian Office (ECHO)[1], was based on preceding in-depth analysis and evaluation of the WASH cluster performance, and on the resulting Global WASH Cluster strategy 2011-2015 which identified the need to 'strengthen WASH coordination mechanisms at country level to respond effectively to humanitarian crises with predictable leadership, accountability, and collaborative partnership'.

Following upon the recommendations made in the RECA Baseline Survey Report (2012) the RECA project and UNICEF Sri Lanka supported the Ministry of Water Supply and Drainage (MWSD) for organizing a training on WASH Vulnerability Assessment in November 2012. The course outputs resulted in draft WASH Vulnerability Assessment questionnaires, focusing on three major natural hazard events faced by the country viz; Droughts Floods and Landslides.

Given the diversity in processes for assessing needs and vulnerabilities in country, it was decided that the draft questionnaires need to be further refined and contextualized to the country specific WASH situation. The issue of contextualized tool-kit was discussed by UNICEF Sri Lanka in the National Water Sanitation Coordination Meeting in June 2013. The Secretary, MWSD agreed upon the need and suggested to incorporate the views of the district level government WASH staff, involved in WASH response during emergencies. It was decided the focus would be on recurrent hazards like Drought, Flooding and Landslide while also covering the concurrent issues like Chronic Kidney Diseases.

Objectives

- Design a comprehensive toolkit for conducting community-based WASH vulnerability and needs assessment before and after a disaster.
- Establish a stakeholder-wide understanding and agreement on the design including uniformity of the toolkit.

A toolkit comprising the questionnaires, checklists, indicators alongwith the guidelines for the participatory approach would provide the humanitarian community with a uniform approach for WASH needs and vulnerability assessment.

Process

SEVA Lanka Foundation was identified as the partner agency by the RECA project and UNCIEF to work in collaboration with the MWSD officials in developing the toolkit. Work was initiated in January 2014 with visits undertaken to vulnerable areas like Batticaloa, Vavuniya, Nuwara Eliya and Anuradhapura. Focused group discussions, key informant interviews were organized to ascertain the status and derive the assessment process. Seva Lanka also field-tested the toolkit through its staff and their feedback was obtained in making the document more user-friendly.

The draft toolkit was then presented to the National Water Sanitation Coordination Meeting in November 2014 for their feedback. This toolkit has now been translated into Sinhala and Tamil and is ready to be shared with the wider WASH audience in the country.

This toolkit has been a result of collaborative endeavor between the Government (MWSD), UNICEF and NGO partner (Seva Lanka) with support from the RECA project of the Global WASH Cluster. It will initiate a uniformity in approach and process for assessing humanitarian WASH needs and vulnerabilities enabling appropriate responses in a timely manner, under the leadership of Ministry of Water Supply and Drainage in country.

[1] In Sri Lanka, ECHO's assistance for emergency relief during conflict and natural disasters focused on the sectors of shelter, non-food relief items, water and sanitation etc. with an emphasis on capacity building and coordination.

Contents

Key terms and definitions	4
1. Introduction	5
2. Context and Framework	6
3. Pre disaster vulnerability assessment (WASH Indicators)	8
4. Post disaster needs assessment	8
5. Indicators	10
6. Checklist	11
7. Guidance Notes	13
8. Further Reading & References	15
Annex 1	15
Annex 2	17
Annex 3	18

Key terms and definitions

Disaster	A serious disruption of the functioning of a community causing widespread human, material or environmental losses which exceed the ability of the affected community to cope using its own resources
Hazard	Phenomenon or situation, which has the potential to cause disruption or damage to people, their property, services and environment / there is a potential for an event to occur
Vulnerability	The conditions determined by physical, social, economic, and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards
Capacity	Positive condition or abilities which increase a community's ability to deal with hazards
Risk	The probability that a community's structure or geographic area is to be damaged by the impact of a particular hazard
Relief	Measures required in search and rescue of survivors to meet the basic needs for shelter, water, food and health care
Mitigation	Measures taken prior to the impact of a disaster to minimize its effects (sometimes referred to as structural and non-structural measures)
Preparedness	Measures taken in anticipation of a disaster to ensure that appropriate and effective actions are taken in the aftermath
Hygiene Promotion	Systematic attempt to enable people to take action to prevent water and sanitation related disease and to maximize the benefits of improved water and sanitation facilities
Assessment	A structured process of collecting and analyzing data to measure the impact of the crisis, and provide an understanding of the situation and any related threats, in order to determine whether a response is required and, if so, the nature of that response. An assessment is a time-bound exercise that produces a report and recommendations to inform decision-making at a particular point in time

Sources: WASH Cluster Coordination Handbook, 2009 & Asian Disaster Preparedness Centre (ADPC)

Abbreviations

CWS	Community Water Supply
DMC	Disaster Management Centre
HH	Household
HVC	Hazard, Vulnerability and Capacity
MoH	Ministry of Health
NAVA	Needs And Vulnerability Assessment
NWSDB	National Water Supply and Drainage Board
RWHT	Rain Water Harvesting Tank
WASH	Water, Sanitation and Hygiene

1. Introduction

Sri Lanka is experiencing multiple natural disasters with severe impacts over the past years affecting human lives, disturbing human settlements and damaging properties. The most frequently occurring natural hazards of Sri Lanka are the floods and droughts. Apart from this, Sri Lanka is also prone to other hazards such as coastal erosion, landslides, cyclones and tsunami (DMC, 2012). Some parts of Sri Lanka are also facing an enormous challenge with Chronic Kidney Diseases of Unknown Aetiology (CKDu).

Increasing number of CKDu affected people in Sri Lanka is a real concern of health related issues and particularly in the North-Central dry zone. Several studies have been carried out to understand the root causes which help the health and other relevant authorities to mitigate the CKDu as well as to respond to the needs of the CKDu affected patients. One research findings suggests that although no single geochemical parameter could be clearly and directly linked to CKDu aetiology on the basis of the elements determined during the study, it is very likely that the unique hydrogeochemistry is closely associated with the incidence of CKDu (Chandrajith, R., et.al, 2011). However different research analysis attribute the issue of CKDu to multiple factors including water, but the root causes has not been well established so far.

WASH Vulnerability and Needs Assessment tools//formats/checklists – consisting indicators/methodology and guidelines, has been divided into 4 sub categories.

1. Water supply (Access, Quality and Quantity):
2. Sanitation (Excreta disposal)
3. Waste control and management (Drainage, Vector Control & Solid Waste Management)
4. Hygiene practices/promotion

Actions in the pre and post disaster response are guided by set of principles. One of the key sets of principles for agencies working in the disaster response is contained in the Sphere Project Humanitarian Charter and Minimum Standards in Disaster Response (2012). These principles are mainly derived from the legal instruments and reflect rights based approach of the population that the WASH stakeholders serve.

CKDu issues are mainly factored with water. Therefore this document only discusses about water supply (Access, Quality and Quantity) for the purpose of pre and post emergency assessment.

Chronic Kidney Diseases (CKDu) – Unknown Aetiology

Research findings highlights that the CKDu mainly affect the male from poor socio-economic conditions and particularly involve people from paddy farming community. The high prevalence of CKDu issues in Sri Lanka is in the North-Central Province of Sri Lanka, where majority of them are farmers.

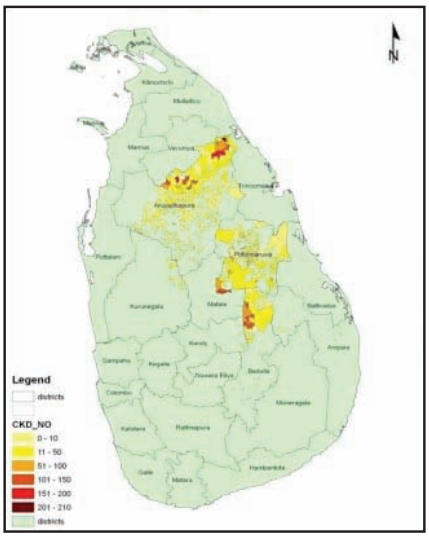


Figure 1. Geographical distribution of CKDu issues in Sri Lanka (Source: Dhammika-Menike-Dissanayake)

2. Context and Framework

Chronic Kidney Diseases of Unknown Aetiology (CKDu) has now become a major public health problem in Sri Lanka, mainly in the North Central region. The total number of affected individuals with CKDu is unknown; however hospital statistics suggest that in excess of 8,000 people are currently undergoing treatment for this condition (WHO, 2012).

CKDu research Studies on heavy metal and ochratoxin exposure have revealed conflicting results. Fluoride content of well water in all these areas exceeded the WHO recommended level of 0.6 mg/L. Water in all areas was alkaline which could facilitate mobilization of fluoride from minerals indicating a fluoride mediated mechanism for renal damage (K. Wanigasuriya, 2012).

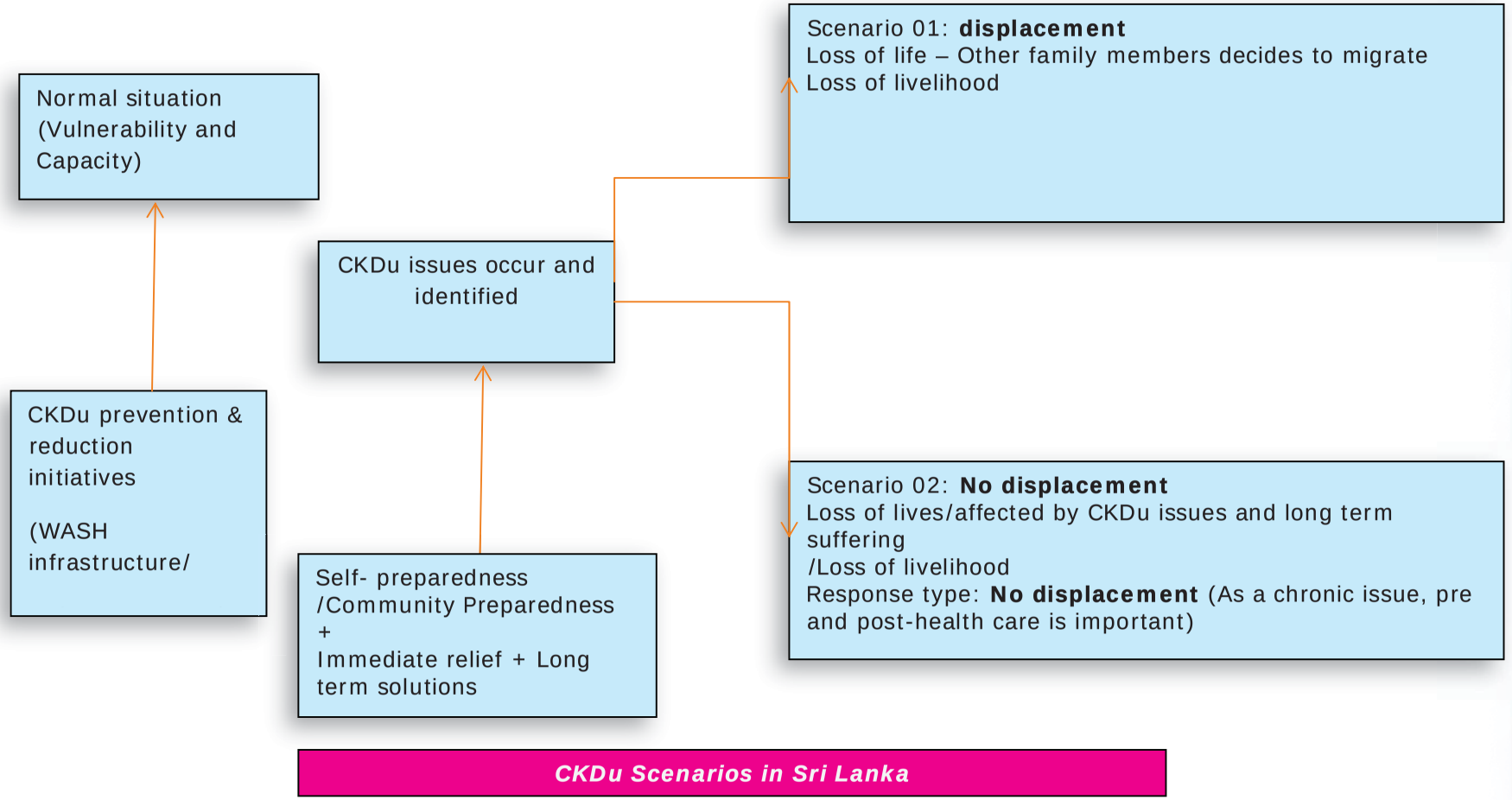
It is apparent that numerous CKDu related research projects have been completed, most of them from the health point of view, but none of them seem to conclude a real definitive root cause for this problem due to the complexity of different factors causing CKDu. Some research findings attribute this problem to Cd and As, while other researches look into a multi-disciplinary cause factors.

A progress report submitted in February 2012 in research on chronic kidney disease of uncertain aetiology, in North Central and Uva Provinces in Sri Lanka within the framework of the National Research Programme highlights that, North Central and Uva Provinces, a minimum of 15% of people in the age group 15-70 years are affected by CKDu. Men over the age of 40 years, who are engaged in farming for more than 10 years, are at higher risk of developing this disease. In addition, exposure to agrochemicals also increases the risk of developing CKDu. The majority of men and women suffering from this disease excrete raised levels of arsenic and/or cadmium in the urine. This indicates consumption of arsenic and cadmium in either water or food. Studies done so far on (drinking) water samples from Anuradhapura, Polonnaruwa and Badulla show that cadmium and lead levels are within normal limits.

WHO final report also highlights that drinking water is a major pathway for entry of inorganic As into the human body. The WHO Guideline for As in drinking water is 10µg/l. US Environment authority suggested that it should be no more than 5µg/l.

In the context of WASH indicators for CKDu, this document looks at the no-displacement scenario, where families still live in the same area affected by CKDu. Therefore pre and post CKDu division becomes complex and for the purpose of WASH indicators for CKDu, it is included in the pre and post health care, as CKDu is a chronic issue. As CKDu issues are inter-related to other sectors such as agriculture, food, environmental and chemical usage etc…, this issue needs to be conjugated very well with all sectors, rather than relating to water alone.

WASH indicator development phases (For CKDu Issues)



3. Vulnerability assessment (WASH Indicators)

Detail assessment and mapping exercise need to be done to map out the potential vulnerable areas to CKDu issues. Although CKDu issues are attributed to many factors, one of the important factors is water. This assessment is at least tri-sectoral – water, agriculture and health sectors together and all other cross-cutting stakeholders also need to be involved.

As the caseload of CKDu patients and affected population is in certain areas of Sri Lanka, it is important to understand any cultural practices that also influence the CKDu issues. CKDu vulnerability assessment is technical and socio-cultural factors need to be factored into the research, so that the mitigation measures devised from the research outputs become practical and acceptable to the community.

Communities affected by CKDu seem to have limited options for high quality drinking water. The vulnerability assessment and mitigation measures should be implemented with the participation of the communities at stake.

Water Quality test needs to be carried out where ever relevant and people should be educated. Awareness programmes are key to communicate the message to the community. **CKDu occurs in areas where groundwater is the main source of drinking water. Groundwater in this region is known to have a high content of Fluoride and Calcium. However hardness of water, the high fluoride content, Poor access to drinking water and inadequate intake of water in a warm climate may influence the body burden and/or the excretion of heavy metals and oxidative damage to the kidneys caused by heavy metals** (WHO, 2012). **Therefore it is important to have a good analysis of access, quantity and quality of water source of the people in the areas of CKDu issues.**

4. Post CKD needs assessment

Post CKDu needs assessment can be done for every village. However every individual case needs to be assessed against set of health indicators. Post-health care is very key to manage the CKDu cases. Health authorities need to ensure the infrastructure and the human resources to provide appropriate care for the CKDu patients. Post CKDu conditions need to be carefully studied with household level socio-economic conditions and appropriate measures need to be proposed to the governmental and non-governmental organisations to address the issue appropriately.

5. Indicators

1. Water supply (See guidance notes 1-2):

- **Identification of appropriate water sources:** Appropriate community water supply schemes are installed for safe drinking water purposes.
- **Prioritize the affected population based on the pre-disaster vulnerability analysis**: Most vulnerable groups need to be identified and the access (with appropriate quantity) to safe drinking water needs to be met.
- **Access to water collection and storage facilities:** Affected families have water collection and storage facilities to collect and store water enough for the period until the next distribution or collection.
    - Maximum distance from the dwelling to the nearest water collection point is 500 meters.
    - Queueing time at a water source is no more than 30 minutes.

2. Monitoring of water quantity and quality(See guidance notes 3-4):

- **Risk of health hazards is minimized**: All measures should be taken also in the schools, at the health centers and in public places to install safe drinking water points to minimize the health hazards. Regular screening for the CKDu issues need to be carried out and a proper mechanism exists at the MoH level. Enough Public Health Inspectors (PHIs) are employed to serve the community. A special task force is formed to regularly discuss this issue with all concerned stakeholders including health and water related actors.
- **Monitoring of the deterioration of water availability:** This should be carried out to avoid adverse effects and planning should be adapted to the changing situation.
- **Protection of water supply sources:** All possible measures need to be introduced to protect the water supply sources from agro-chemical dissolvent.
- **Awareness raising:** Regular continuous awareness raising programmes on the importance of safe drinking water need to conducted.
- **Introduce water filters at the point of use or at the source:** Appropriate water filters should be used at the source or at the point of use, as necessary. Poor families need to be supported with the appropriate water filters to be used at the point of use.

6.Checklist

WASH Assessment Checklist for CKDu issues:

INDICATORS		Quantitative status	Qualitative status	Assessor remarks	
				Level of vulnerability (Scale 1-5)	Risk of deterioration (High to Low)
1.1 Water Access	1.1.1. Source of drinking water at household level				
	1.1.2. Distance to water source from household				
	1.1.3. Average time required (minutes) for one water-collection journey, including travel in each direction and queuing from household				
	1.1.4. Proportion of households/families with access to a source of safe drinking water in the village				
	1.1.5. Distance of water source from the sanitation point at household				
	1.1.6. Maximum users/water source (Households in the village)				
	1.1.7. Number of water collection containers per household (Minimum 2, one for storage and one for transportation)				
	1.1.8. Water storage facilities at household level				
	1.1.9. Use of filters at households (proportion of households using the filters)				
	1.1.10. Any filtering mechanisms available at the source or point of delivery before household				
1.2.Water Quality	1.2.1.a. Water quality at source				
	1.2.1.b. Water quality at delivery for households				
	1.2.2.a. Risk of contamination at water distribution points				
	1.2.2.b. Risk of contamination at collection point				
	1.2.2.c. Risk of contamination during transportation				
	1.2.3.a. Available treatment at source				
	1.2.3.b. Available treatment at the point of use (Community/At household level)				
	1.2.4. Proportion of households where only safe water is used for drinking and cooking				
1.3.Water Quantity	1.3.1. Available quantity for drinking and cooking purposes at the source				
	1.3.2. Used per person per day for drinking and cooking (liters per person per day) – Average value				
	1.3.3. Period of water availability at household/village and at the supply point				

2.1.CKD Health Care	2.1.1. Available health care facilities for CKD patients in the village/division				
	2.1.2. Availability of medical doctors and Public Health Inspectors, who can tackle CKD issues				
	2.1.3. Additional support to CKD affected families (Financial/Non-financial)				
	2.1.4. Frequency of dialysis by CKDu affected people				

Note: Since CKDu is a no-displacement scenario, guide to fill the checklist during the vulnerability assessment and during the CKDu response needs assessment remains same.

Guide to fill the checklist: (Should be completed with the help of Indicators and Guide Notes)

During pre-flood vulnerability assessment and during the post-flood response needs assessment:

"*Quantitative status*" means wherever possible, give the number, for example – number of different type of available water sources in a community. If there are two different types of sources, you may write '2'. If not possible to give a number – a quantitative figure, mark as N/A – Not Applicable.

"*Qualitative status*" means just to say "OK", if the qualitative status of the indicator is OK. If not say "No", if it is not reached. Wherever possible, elaborate in bullet points, for example – what are the type of water sources available in the community. If there are '2' types of sources, write them down. For example; 1. Open dug well, and 2. Rain water harvesting tank.

"*Level of vulnerability*" in scale of one to five. 1- "Very Low Vulnerability", means community is less vulnerable to this indicator. For the same example 1.1.1., if assessor thinks that the water sources in the community is less vulnerable to flood, and then can mark as 1.
Similarly with the increasing gravity of vulnerability up to five. 5 means water sources available in the community are highly vulnerable to flood.

"*Risk of deterioration*" – the possibility that the status can deteriorate further. If the assessor thinks that the chances are low, then it is marked as "Low", or if it is high, then mark as "High".

7. Guide Notes

1. Water access: Water source in the village could be;
   - A source at the household level
   - Temporarily installed tank
   - Supply through a water bowser
   - Common/Community source

   Referring back to the pre-vulnerability mapping and identify alternative water sources to ensure that the community is supplied with safe and sufficient quantity of water for drinking purposes. If needed a nominal charge could be obtained from the community which covers the cost of regular testing and maintenance of the scheme.

   A water capacity resource map should be drawn to show the different water accessibility
   (See Annex 1 for sample map).
   - Rapid implementation of new, or upgrading of existing water points may be required in the village to access safe water for drinking and cooking purposes. (e.g. install new tanks, increase the number of water deliver outlets); and
   - Water tankering may be necessary when there is no access to safe water for drinking and cooking for a certain period of time.
   - If there is no water source available in the community which can provide safe water for drinking and cooking purposes, water tinkering needs to be continued at regular interval, until an appropriate mechanism is installed to supply safe water.

2. Water source:
   Several water sources may be available in the community including;
   - Natural streams
   - Open Dug Well (Protected/Unprotected)
   - Tube well (Shallow/Deep)
   - Pipe borne (NWSDB/CWS)
   - Rain water harvesting tanks

   However, all available water sources need to be checked for its quality against the standards. Standard water testing method should be employed.
   Bottled drinking water could be also possible source if no other feasible options are available and if it is economical.
   A water resource map can be drawn to show different water sources in the community. (See Annex1 for example).

3. Water quality: Following parameters of water at source should be measured.
   - Feacel Coliform
   - Hardness
   - Turbidity
   - PH value

   Water filters such as RO (Reverse Osmosis plant), sand clay filters are commonly used by people in the CKDu risk areas. These filters are regularly tested. A mechanism should be established so that the regular testing facilities are made available.

   Filters are made available at each household which can filter As and Cd. New type of clay pot filters are introduced in the market at an affordable price. Communities need to be made aware of these products.

   Refer the sample form in Annex 2 to measure the water quality parameters.

4. Water quantity: Amount of water used per person per day should be measured for the following purposes.
   - Drinking
   - Cooking
   - Personal hygiene

   Quantitative survey, Semi-structured interview or Focus Group discussion can be used to find out the quantity of water used in the community.

5. Support to CKDu affected families:

   1. Support the CKDu affected families: Financial support with appropriate mechanism should be established to support the poor families affected by CKDu issues. This support is vital if the bread winner is affected by CKDu and lost the livelihood.

   2. Health care facilities and support: Appropriate mechanism is established to support the CKDu affected families to cover the cost of health care.

8. Further Reading & References:

1. Sphere Minimum Standards, The Sphere Project, 3rd edition, 2012.
2. Rohana Chandrajith, Shanika Nanayakkara, Kozuyoshi Itai, T. N. C. Aturaliya, C. B. Dissanayake, Thilak Abeysekera, Kouji Harada, Takao Watanabe, Akio Koizumi, Chronic kidney diseases of uncertain etiology (CKDue) in Sri Lanka: geographic distribution and environmental implications, Environmental Geochemistry and Health, June 2011, Volume 33, Issue 3, pp 267-278.
3. K. Wanigasuriya, Aetiological factors of Chronic Kidney Disease in the North Central Province of Sri Lanka: A review of evidence to-date, JOURNAL OF THE COLLEGE OF COMMUNITY PHYSICIANS OF SRI LANKA Volume 17, No. 01, June 2012.
4. WHO, Final Report, Investigation and Evaluation of Chronic Kidney Disease of uncertain Aetiology in Sri Lanka, 2012.
5. Dr Shanthi Mendis, Chronic Kidney Disease of Uncertain Aetiology (CKDU) Sri Lanka, Senior Adviser and Coordinator, Chronic Disease Prevention and Management, World Health Organization, Geneva, Switzerland, Progress Report 13 Feb 2012.

Annex 1

Available community participatory or survey tools for WASH assessment:

1. Direct Observation: Example of a direct observation checklist.

Questions	Yes	No	Comments/details/ observations
Is there queue at the common water points?			
Do households have suitable clean covered water storage containers? (Ask to see HH water storage in several households)			
Is there a problem with garbage/waste around where people are staying?			
Are there latrines at the site?			
Are the latrines functional? (Visit the latrines)			
Other (Specify) _____			

2. Opening and area-specific questions:

Is there a serious problem in your community, because people do not have enough water that is safe for drinking or cooking?

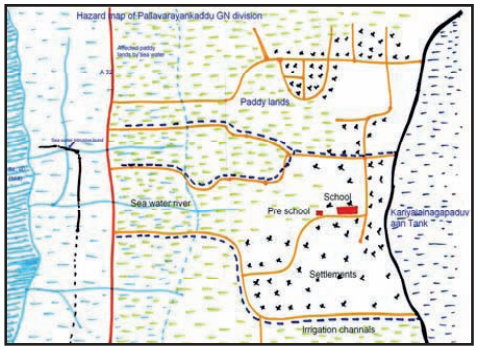
Yes	No	Do Not Know

What are the main sources of water in your community (tick all that apply)?

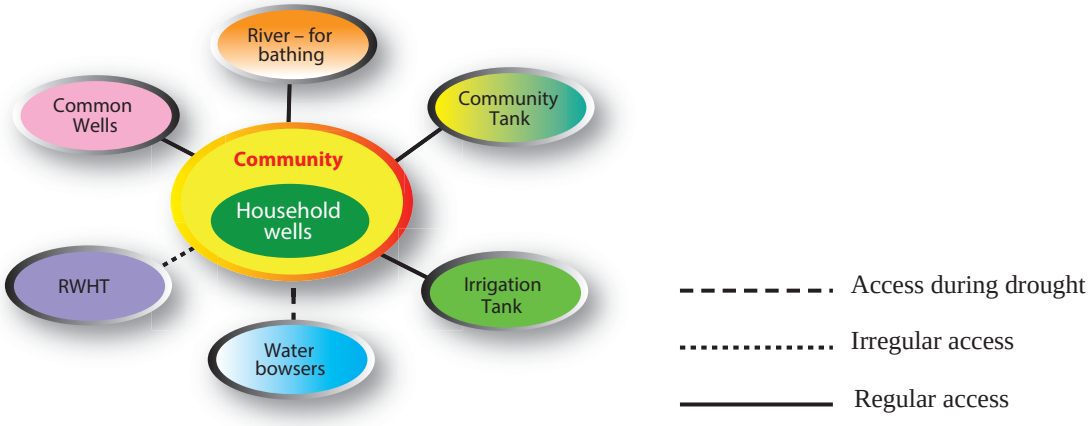
- Tube well with functioning motor pump
- Tube well with functioning hand pump
- Protected open well
- Unprotected open well
- Piped water
- Surface water
- Traditional water sellers
- Humanitarian assistance
- None

3. Mapping exercise:

3.1 Example of a resource map; existing water points can be indicated in a map.



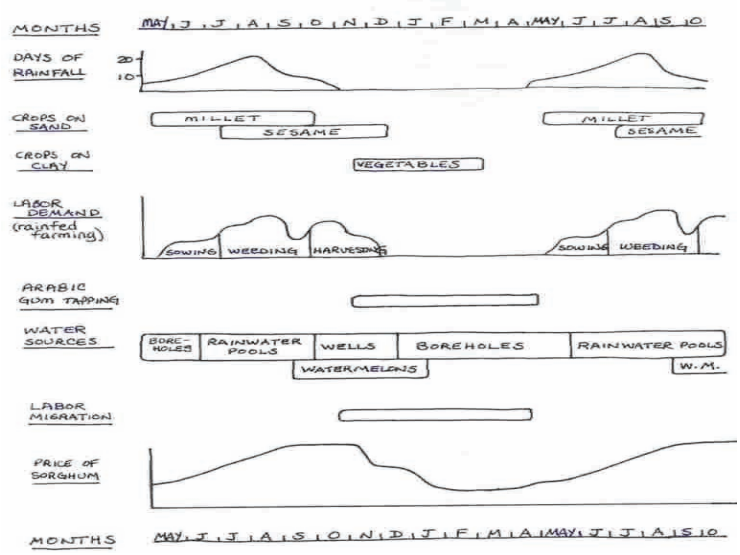
3.2 Example of a mobility map for water supply/collection



4. Other useful participatory tools (Source: RedR training manual).

4.1 Seasonal Calendar

The seasonal calendar contains a lot of information about seasonal changes and related hazards, diseases, water availability, community events and other information related to specific months of the year. Using ten stones (ten being the highest score) indicates degree, severity or extent of the change.



4.2 Transect

Transect is a highly enjoyable activity since this involves walking in the community following a certain path or direction. This helps to identify the water points in the community and experience the real testing of what is indicated in the map. Sample of transect walk output is given below.

SOIL	rocky	gravel	gravel	sand	clay
LANDUSE	forest	farmland grazing	village	farmland grazing	farmland
CROPS AND VEGETATION	trees, bamboo	grass, shrubs, millet, sesame		sesame, beans, hibiscus	sorghum, groundnuts
PROBLEMS	erosion	drought, pests		drought, pests, low soil fertility	drought
OPPORTUNITIES	fuelwood, timber, bamboo	pasture, rainfed farming	market, transport, water, credit, health-care, school	pasture, rainfed farming	flood-recession farming

Annex 2

GUIDELINES FOR DRINKING-WATER QUALITY

The parameters most commonly measured to assess microbial safety are as follows:

• ***E. coli****:* The objective of zero *E. coli* per 100 ml of water is the goal for all water supplies and should be the target even in emergencies; however, it may be difficult to achieve in the immediate post-disaster period. This highlights the need for appropriate disinfection. Thermotolerant coliforms may provide a simpler surrogate.

• ***Residual chlorine:*** Taste does not give a reliable indication of chlorine concentration. Chlorine content should be tested in the field with, for example, a colour comparator, generally used in the range of 0.2–1 mg/litre.

• ***pH:*** It is necessary to know the pH of water, because more alkaline water requires a longer contact time or a higher free residual chlorine level at the end of the contact time for adequate disinfection (0.4–0.5 mg/litre at pH 6–8, rising to 0.6 mg/litre at pH 8–9; chlorination may be ineffective above pH 9).

• ***Turbidity:*** Turbidity adversely affects the efficiency of disinfection. Turbidity is also measured to determine what type and level of treatment are needed. It can be carried out with a simple turbidity tube that allows a direct reading in nephelometric turbidity units (NTU).

Water of Acceptable Quality

No pathogens	Free residual chlorine content at discharge points 0.5mg/l (pH < 8) minimum 30 minutes contact time 0.5-1.0mg/l (pH > 8) minimum 60 minutes contact time Or no presence of E.Coli/100 ml at discharge points if chlorination is really not possible (=> water filters highly recommended)
Low turbidity	<5NTU
Acceptable to users	No colour, taste or odour, and not salty

Safe water is defined as water that: (1) comes from a protected and/or treated water supply and/or is treated at household or point of use; (2) is collected and stored in clean covered or narrow-necked containers; (3) is transferred safely during collection at the water point, when transferring from collection containers to storage, (4) containers and when transferring to containers used for drinking or cooking (Global WASH Cluster indicators).

Annex 3

WASH Assessment tool for CKDu (individual / Family):

Water:

1. Drinking water source
   Well / Tube well / Deep tube well / Tank or channel water / Rain water / CWS / NWS&DB / Commercial Products (bottled water)
2. Number of years using the source:
3. Distance between home and water source:
4. Responsible of collecting water: father/ mother/ elders/ elder children/ servant
5. No of litres of water consumption per capita per day:

Family members	Employment	Litres consumed/ Day	Past history of having back pain	Past history of having irritation while urination	Past history of admitted to hospital	If any of the family member is suffering by CKDu
1.						
2.						
3.						
4.						
5.						

6. If any of the family member is suffering by CKDu:
   No of years/ Months: under treatment/ cured/ Defaulter
7. Do you trust your water source?
8. What could you say about the taste of the water:
9. What could you say about the smell of the water:
10. What could you say about the colour of the water: