

Technical Guidelines On Water Trucking in Drought Emergencies



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Emergency water trucking to drought-affected populations, particularly in the Horn of Africa, has become cyclical intervention as rainfall patterns in these areas has become increasingly unpredictable. In addition to being expensive and unsustainable, cyclical water trucking is coming under increased scrutiny as it increasingly appears to have negative impacts on pastoralist livelihoods, existing coping mechanisms in times of water scarcity, and inflation in the price of water.

This technical brief presents information on assessing the appropriateness of water trucking interventions, setup of emergency water trucking in drought, and alternatives to water trucking. It is intended to assist field staff and managers on the most appropriate option for emergency water provision in drought, and to give practical case studies demonstrating their setup and associated challenges. This guide is meant to be utilized in the initial stages of drought to select and appropriately implement (and responsibly exit from) the most suitable form of emergency water provision.

Introduction

Emergency water trucking (EWT) is typically a short-term, life-saving intervention that is used to cover interruptions in water service or access to sufficient quantities of water to meet survival requirements.

While playing a legitimate part in response when used appropriately, in the Arid & Semi-Arid Lands (ASALs) of east Africa, emergency water trucking often plays a very different role, as a coping mechanism in the daily lives of a large percentage of the population.

EWT has become an almost yearly humanitarian intervention among aid organizations in the ASALs. Additionally, a robust commercial water trucking market exists in many areas to serve populations & pastoralists who have no permanent water source. In addition to climatically-induced water scarcity, a number of other factors drive EWT:

- Poor settlement patterns propelled by political interests of politicians;
- Creation of too many new Districts necessitating the establishment of new administrative centers, even in locations without reliable sources of water;
- Commercial interests of businessmen;
- Lack of long-term strategies for investing in reliable/adequate water sources in ASALs;
- Frequent borehole breakdowns;
- Dependency syndrome on the part of communities.

When working in the ASALs, it is vital to understand the difference between drought and aridity. Drought differs from other natural disasters in that it does not have a universal definition – it is very region and impact specific. Drought is generically defined as “a period of abnormally dry weather sufficiently long enough to cause a serious hydrological imbalance” (NOAA). It is temporary and recurrent natural event that is a normal part of climate, whose onset and end are difficult to identify.

Aridity is a permanent feature of climate, defined as “the degree to which a climate lacks effective, life-promoting moisture” (Glossary of Meteorology, American Meteorological Society).

In summary – a drought causes temporary water shortages, while aridity is a state of chronic water deficit. The overwhelming majority of the Horn of Africa consists of ASALs, and as such suffer from chronic water deficit. Traditionally, populations in these regions have survived in these conditions by adopting a nomadic or semi-nomadic lifestyle – seasonally migrating with their livestock in search of water and pasture, and adopting a lifestyle which has commonly required trekking distances of up to 20 kilometers

on a regular basis to obtain water; these are the coping mechanisms that have allowed these populations to survive in the resource-scarce ASALs.

When is Emergency Water Trucking Appropriate?

Water trucking should be a last-resort option for emergency provision of water in drought. Several key questions must be considered during the planning phase of the emergency response to gauge the appropriate response modality:

- How does the target population normally access water during the dry season? Are there existing coping mechanisms that could be supported/reinforced?
- If EWT is to focus on settled pastoral communities, is there a risk of causing over-grazing of wet-season grazing areas (especially around EWT distribution points)?
- Will EWT provide support to temporary mobile communities through the provision of water to distant grazing areas in order to distribute pressure on scarce natural resources?
- Are the yields of boreholes sufficient to meet the water needs of water trucks in addition to the everyday users?
- Will EWT impact migration patterns of pastoralist populations?
- Will the most vulnerable populations and communities be insufficiently targeted due to road access problems?

Figure 1 is a decision tree which demonstrates how to select when EWT is an appropriate response modality, and when an alternative modality is more appropriate.

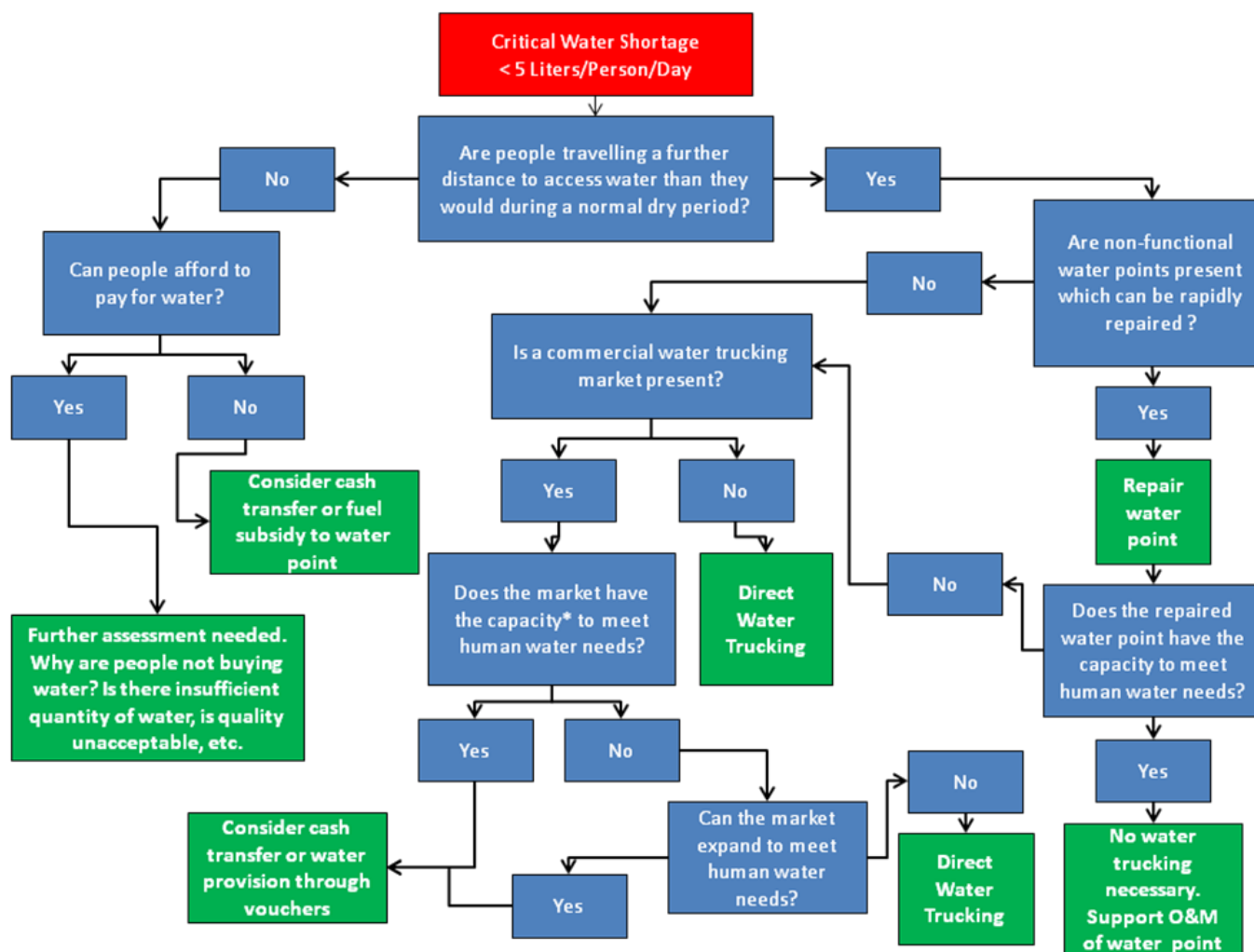


Figure 1 Decision tree for emergency provision of water.

*Capacity refers to: number, condition and capacity of water trucks available in the market; yield and expandability of water points to be utilized for water trucking; capacity of water trucks to access targeted communities. For further information on market capacity assessment, see the *Emergency Market Mapping & Analysis (EMMA) Toolkit* and the report *Water Trucking Market System in Harshin, Ethiopia* (see References section).

Additionally, the timing of a potential water trucking intervention needs to be carefully considered. The Food and Agricultural Organization of the United Nations (FAO) has developed “crisis calendars” for many countries which suffer from cyclical drought (a good example of this is the “road maps” developed by the FAO Ethiopia Agricultural Task Force, for drought-affected regions of Ethiopia); the purpose of these calendars is to demonstrate the appropriate timing of potential drought interventions. All potential activities should be analyzed in relation to the seasonal calendar of the population in order to determine the appropriate beginning and end times of common emergency interventions such as Cash for Work, rehabilitation/repair of water points, creation of water harvesting points, water trucking, etc.

Technical criteria

Water quantity

Although SPHERE recommend 15 liters of water per person per day for adequate provision of water, most populations in ASALs consume a quantity significantly less than this during “normal” times. This SPHERE indicator is not a realistic one in the ASALs for the following reasons:

- Logistically it is very difficult to ensure delivery of 15 Liters/person/day in sparsely populated areas with limited water resources;
- 5 liters/person/day is considered the critical live saving indicator (SPHERE);
- Only drinking and cooking water should be prioritised during EWT programmes.

It is essential that all previous hygiene promotion messages are changed significantly to ensure that there is no additional burden on water trucking volumes but still encourage key good hygiene practices. New key hygiene messages should be developed in line with the scarcity of water to focus on good hygiene behaviour without the excessive use of water (e.g. cleaning hands with ash/sand, finding out how the communities keep clean by use of traditional leaves/rendered animal fat, using sand to clean cooking utensils, etc). In addition to messaging, it is essential to work with people who already utilize good practices to act as “change messengers” – more important than the messages themselves is the motivation to actually utilize these messages.

Guidelines for water quantity in water trucking operations vary, though a minimum of 5 liters/person/day should remain the minimum target for survival and basic hygiene needs. WASH clusters within the Horn of Africa recommend the following:

Somalia WASH Cluster:

5 liters/person/day for drought-affected populations;

7.5 liters/person/day for internally displaced people (IDPs).

Ethiopia WASH Cluster:

5 liters/person/day for drought-affected populations;

Kenya WESCOORD:

7.5 liters/person/day for drought-affected populations;

The quantity of water provided will depend not only upon the agreed indicator, but also the ability to physically transport water to the affected population will also play a significant role in delivery volumes to the target populations. Other potential limiting factors in meeting the agreed volumes of water to the community are:

- distance from tanker filling point to the distribution point;
- number of water points available for use in the area;
- number of water trucks available for hire in the area;
- storage facilities available at the distribution point.

Water quality

Water trucking for human consumption must provide water that is potable and adheres to SPHERE indicators for water quality. Water quality is ensured in emergency water trucking thru the following:

1. **Selection of tanker filling water source** – water points sourced for water trucking in ASALs include drilled boreholes, surface water runoff (collected in earth pans, hafir dams, birkads, etc.), and municipal water supply systems. The water quality of these different sources varies greatly. While boreholes typically provide good quality water that can easily be chlorinated for drinking, surface water collection points typically contain water that is too turbid for water to be chlorinated without pre-treatment (coagulation/flocculation or filtering).
2. **Water Treatment** – water should be chlorinated to produce a chlorine residual of 0.5 mg/L at the point of use. This can be accomplished in various ways:
 - a. *Chlorination at the water source* – chlorination can be done in the water tanker itself; the advantage of this method is that a large quantity of water can be quickly and easily chlorinated using HTH chlorine, and the water can immediately be utilized by beneficiaries upon collection. The challenge experienced in many drought responses, however, has been the refusal of water tanker operators to allow chlorination within the metal tank due to potential corrosion of the tanker.
 - b. *Chlorination at the distribution point* – chlorination can be done at the distribution point whereby community orientation operators add the necessary chlorine to the trucked water, prior to distribution. This was carried out in Wajir, Kenya during the 2011 drought response. Challenges experienced in this, is ensuring that the dosing of chlorine is done in conjunction with the water delivered, and to the correct dosing requirements
 - c. *Chlorination at the household level* – this is typically accomplished through the provision of Aquatabs or a similar chlorine product which is capable of treating one 20-liter jerry can of water. This has been implemented in interventions where chlorination of water at the source was not possible. Chlorination at the water source or in the water tanker is preferred over this method as chlorination at the household level requires additional activities and resources such as:
 - i. Distribution of Aquatabs to intended users;
 - ii. Sensitization on the use of Aquatabs;
 - iii. Post-distribution monitoring on proper use and chlorine residuals at the household level.

Water storage

Safe water storage is a non-negotiable requirement at each water distribution site in order to:

- Provide storage for a quantity of water sufficient to meet the population's demands for a specified period of time;
- Prevent contamination of the water and maintain water quality;
- Prevent evaporation of the water.

Various water storage vessels may be utilized:

- **Existing water storage facilities** in settlements (masonry water tanks, tanks used for rooftop rainfall collection, etc.) – these should be prioritized. The tanks should first be cleaned and checked for damage. *Advantages:* already exist within the community; can be rapidly utilized. *Disadvantages:* may be damaged; may not be clean or covered; storage capacity may be insufficient.
- **Plastic Tanks** – many countries in HECA sell locally-manufactured plastic tanks (Roto tanks being an example in East Africa) that are available in various sizes ranging from 1,000 – 24,000 liters. The tanks are easily transportable, durable, safe for potable water storage and can easily be fitted with pipe fittings at the outlet/inlet. Tanks need to be raised to allow water to be collected via a tap. Taps and pipe work needs to be rigidly anchored to prevent damage to the tank. *Advantages:* readily available in most markets; reasonable cost; can be left with the community or local institutions after ending intervention to serve as safe water storage or contingency; easily transportable. *Disadvantages:* if many tanks are needed, cost can become excessive; while tanks are lightweight, they take a significant amount of volume so transport costs may become excessive.
- **Bladders** – bladders can be rapidly set up for water trucking, though local procurement is a challenge. Bladders were used in Wajir, Kenya in 2011 due to the fact that none of the water tankers had water pumps for the offloading of water; water in these areas is offloaded by gravity (typically through a hose pipe). Many settlements in these areas have communal plastic tanks which are buried in the ground in order to allow offloading through gravity flow from the water tankers; the downside of this is that the tops of the tanks are cut off and left open in order to allow extraction of water with a rope and bucket because the outlet is buried. In settlements where there were not tanks present, bladders (5,000 – 10,000 liters) were installed for water storage, in order to allow the offloading of water from the tankers by gravity flow. Because the height of the plastic tanks exceeds 2 meters, offloading into them would not have been possible. *Advantages:* easy to transport, rapid setup, safe water storage, easy to connect to tap stand. *Disadvantages:* costly, procurement time can be lengthy; susceptible to damage.
- **Storage for Mobile Pastoralists** – when trucking water to mobile pastoralists, who are likely to remain in an area for a short period of time, the provision of storage facilities such as a plastic tank or bladder may not be efficient, due to the need to truck to various locations over a period of time as the population is mobile. Previous interventions have instead dug depressions in the ground and lined them with heavy-duty plastic sheeting in order to minimize potential contamination. While the water was still open to contamination, the aim was to attempt to minimize the public health risks by preventing excessive turbidity through lining of the depression, to prevent seepage, depending on the soil type, and or evaporation when covered.

- **Household Level Storage** – households require sufficient storage in safe containers to store, at minimum, the amount of water that they are entitled to collect per delivery of water.

Distribution

Each water storage receptacle must have a hygienic method for water collection. This is best done through connecting the tank to a tap stand (standard Oxfam tap stand or a locally-fabricated unit). This is essential in order to:

- Prevent contamination during collection of the water;
- Prevent long queues during collection times.

All storage vessels must be elevated a minimum of 1-1.5m in order to allow for gravity flow of the water to the tap stand. A challenge is posed when underground/buried tanks are utilized for storage; in this situation, a method must be devised for extraction of the water that minimizes the risk of contamination:

- Use of a hand pump;
- A dedicated bucket/rope that is cleaned/disinfected on a regular basis;
- Separation of people/animals from the access point;
- Protective measures to limit the risk of dirt/contaminants/etc entering into the storage vessel.

Human & livestock use

Water trucking is an expensive and unsustainable intervention, used only as a life-saving intervention. As such, ***Oxfam only provides water trucking for human survival needs and does not provide water trucking to address the needs of livestock.*** The DPPB Somali Region & Ethiopia WASH Cluster “Guidelines for Emergency Water Trucking” states the following:

In general, the cost of water provided for livestock by trucking would greatly exceed their replacement value. Furthermore, livestock need fodder, not only water, to survive. It is therefore not good practice – and a waste of limited resources – to attempt to sustain livestock by water trucking.

The rationale for not including livestock in water trucking interventions includes:

- If pasture/fodder is not available for the livestock, then the provision of water to livestock does not ensure their survival, as their food needs are not being met;
- The cost of replacing an animal is often exceeded by prolonged water trucking interventions (assuming that appropriate destocking and restocking will take place).

If provision of water for livestock is deemed an objective, an alternative intervention such as fuel subsidies to strategic boreholes can be utilized to cater for this need (see [Fuel & Cash Subsidies to Boreholes](#) in the [Alternatives to EWT](#) section and the [Case Study on Wajir, Kenya Drought Response](#)).

Targeting

Once an emergency water trucking intervention has been agreed upon, targeting of beneficiaries is the next step. At the peak of water scarcity, sometimes blanket coverage of the population is the target. At other times (particularly during the early stages of a drought), only a percentage of the population may be targeted.

The following questions must be considered prior to commencing the operation:

- Distance the community has to travel for water in normal times;
- Distance the community has to travel during the drought crisis
- Has the water source changed over the last few weeks – e.g. is it more saline, has the volume reduced, has the source dried completely?
- What coping mechanism would be utilized in the event that no water trucking was implemented?
- How did the community cope during the previous dry season?
- Does the community have the option of purchasing water from private water vendors?

Case Study: Harshin, Ethiopia 2011

Oxfam GB implemented an EWT intervention here to address the failed rains that affected this area. The intervention was meant to only provide water to the “vulnerables” within each community, approximately 20% of the population at each settlement that was identified as a water distribution point. A WASH Committee was established at each distribution point in order to ensure reception of water to the intended beneficiaries.

Field monitoring, however, found the following:

- Upon delivery of the water at the distribution tank, water was taken by the first members of the community who arrived with storage containers (regardless of whether they had been targeted as vulnerable or not); many targeted vulnerable did not receive their allotment of water;
- FGDs revealed that a normal coping mechanism in this area is for the better-off families to collectively de-stock a small number of livestock, and pool their money to purchase water from commercial water trucking operators; typically this water was even shared with the more vulnerable in the community. However, due to the hiring by NGOs of all commercial water trucks in the area, they were no longer able to hire these trucks, and instead competed with the less well-off population for the water provided through this intervention.

Entrusting the WASH committee to ensure equitable distribution of the water to the targeted beneficiaries was not effective. A voucher system may have ensured a more targeted intervention.

Assessment & Planning

Water trucking is inherently insecure method of moving water. In addition to breakdowns if there is conflict in the area then EWT is vulnerable not only to insecurity but to the perception of security. EWT is a high risk endeavour for an Agency that aims to provide consistency in supply.

When planning a water trucking intervention, the following information is required prior to commencement:

1. List of prioritized sites to receive water. Each site assessment should include:
 - a. Number of beneficiaries to be targeted (blanket or specific targeted groups);
 - b. Existing water storage facilities and their condition;
 - c. GPS coordinates of the location;
 - d. Distance to nearest water source water source;
 - e. Water pans or other water collection points in the area.
 - f. Presence of other actors;
 - g. Government or NGO water trucking intervention present?
2. Assessment and selection of potential water sources. To include:

- a. Production capacity of the tanker filling water point (liters/day) – safe yield of the borehole and the capacity of the pumping equipment;
 - b. Current demand at the water point (number of users and quantity dispensed per day) and the additional estimated demand from the local population during the intended period of use – do not want to “overtake” the water point and reduce the access to water of the local users. A priority concern should be to prevent harm to the water security of population at water source; they should not bear the costs of a EWT programme.
 - c. Storage available at water point and need to provide extra pumping capacity considered at proposal stage.
 - d. Number of running hours that it is currently operating at.
 - e. The current queuing time at the water point:
 - i. How long is the population waiting to receive water?
 - ii. How long would the water truck have to wait to receive water?
 - f. Availability of standby pumping equipment, as well as fast-moving spare parts and mechanics/technicians for repairs and maintenance. It is vital to consider provision for supporting repair and maintenance at proposal stage - rapid response teams, fast moving spares, mechanic to supervise trucking operation to ensure continuity of supply.
 - g. Means to prevent contamination of water - hard standing, frames to suspend delivery hoses.
3. Assessment of the commercial water tanker & transportation market. To include:
- a. Number of water tankers available and their capacity;
 - b. Condition of the water trucks:
 - i. Is the tanker safe for potable water storage (not formerly used for petrol; is clean and not corroded; etc.).
 - ii. Is the tanker well maintained and able to reliably make deliveries on the roads they will be expected to drive on?
 - iii. Is the water trucking operator equipped and able to operate a pump for emptying the transported water?
 - c. Number of flat-bed trucks available and their capacity:
 - i. Condition of the trucks (same as b.ii above);
 - ii. How will they transport water? Plastic tank, bladder, etc.
 - d. Does the truck possess pumps and hoses to enable pumping? Will these need to be procured?
 - a. Legality of the vehicle:
 - i. Is the vehicle registration complete and up to date?
 - ii. Does the driver have a legal driving license for this type of vehicle?
 - iii. Is the vehicle road worthy according to local transportation law (working lights, sufficient tires, etc.)?
 - b. Previous experience – has this vehicle worked previously in a water trucking operation?
4. Development of the water trucking plan, which shall include:
- a. Volume of water required per site;
 - b. Travel distances & estimated travel times from water source to distribution point;
 - c. Estimated fill-up time (at the water source & again at the distribution point);
 - d. Existing storage capacities and additional storage requirements;

- e. Capacity of water tankers;
 - f. Health & safety measures at the water source and water distribution point (applicable for operators of borehole, water truck, and attendants at distribution point).
5. This data is then pulled together in a schematic (or using a programme such as Google Earth) such as this example:

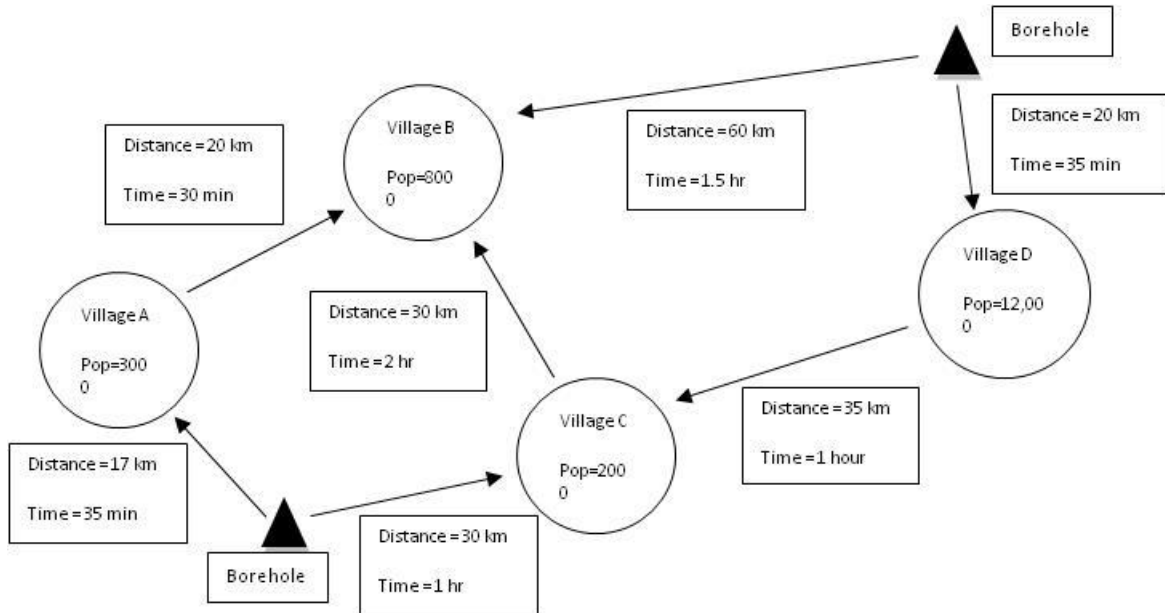


Figure 2 Example of a water trucking delivery plan.

From this plan, a delivery schedule for each contracted water tanker/truck can be developed.

6. Designing Mechanisms for Accountability & Monitoring of Deliveries – mechanisms need to be put in place in order to ensure that deliveries are made in a timely manner, that the most vulnerable in the community receive as well as the correct quantity and quality is delivered.
- a. Ensuring delivery of water – there are various methods of ensuring delivery, either alone or in combination:
 - i. Waybills – each water truck has a book of waybills in triplicate. One copy is left with the borehole operator upon filling of the tanker; one copy is given to the focal point at the distribution point upon delivery of the water in the storage vessel; one copy remains with the truck operator to submit to OGB.
 - ii. Monitors – people who ensure that the water deliveries are completed. These can be local community members or hired staff; volunteers or casual labourers. They can be stationed at the water source and/or the distribution point, or can travel with the water tankers. They maintain a log of deliveries and report upon any missed deliveries and/or deliveries that did not meet agreed-upon criteria (quantity or quality of water, time of delivery, etc.).
 - iii. Vouchers – vouchers can be provided to the monitor that is positioned at the distribution point. The voucher is signed and given to the truck operator upon successful delivery; the vouchers are then presented to Oxfam for payment.

Methodology

Water trucking targeting mobile pastoralists (free water)

While water trucking to established settlements has primarily been addressed here, the ASALs are home to a large population of semi-nomadic pastoralists who are often times beneficiaries of drought interventions and, by extension, emergency water trucking.

Mobile water trucking to pastoralists involves the delivery of water to temporary sites along the migration routes of pastoralists. This water is either delivered to plastic storage tanks or, when the quantity of water is small and the site is temporary (a few days), depressions are dug and lined with plastic sheeting to hold the water. This was done by Oxfam GB in Kenya in 2008 - the intervention aimed to truck water to temporary sites in order to:

- support traditional coping mechanisms of pastoralists (e.g. migration patterns);
- reduce risk of environmental degradation (e.g. overgrazing) by reducing large human and livestock concentrations at the few permanent boreholes and water trucking distribution sites in permanent settlements.

Water trucking targeting settlements (free water)

This involves water trucking to established population centers which have no permanent water supply. In this type of intervention, Oxfam directly contracts water tankers/trucks to deliver specified quantities of water to specified distribution points. Oxfam pays for the water (usually purchased from boreholes) and also pays for the transport (water tankers/trucks) to deliver the water. Water is provided at no charge to the beneficiaries. Regular focus group discussions with targeted beneficiaries are required to ensure that access is free.

Water Provision through Vouchers

Water provision through vouchers is an option that can be utilized in areas where a commercial water trucking market exists. In areas of Somalia, Kenya and Ethiopia, for example, some areas of chronic water scarcity routinely pool their resources to purchase water from mobile water tankers. Pre-printed cash vouchers are distributed to targeted beneficiaries, which are then redeemed with their normal water suppliers for a specified quantity of water. Vouchers can be single-use or multiple-use. Cash transfer payments are then made to the commercial suppliers against the submitted vouchers.

Advantages of a voucher system include:

- **Use of the existing commercial market** – by using the existing commercial vendors that the population normal utilizes, local water tanker businesses are supported and reinforced. Exit from the intervention is easier, as the commercial water tankers are still available in the area for those who would like to continue purchasing water.
- **Improved targeting** – in interventions where blanket targeting is not desired, only targeted beneficiaries are given vouchers. In a direct water trucking intervention, it is very difficult to ensure that only the targeted beneficiaries are the ones who are accessing the delivered water. In times where the voucher is either lost or stolen, a verification system can be put in place, by asking the targeted beneficiary one of their preset secret questions (e.g. case of Turkana targeted communities have three secret questions).
- **Cost Effectiveness** – voucher beneficiaries receive water at the current market rates. Direct water trucking interventions, in which NGOs directly contract a large number of water tankers, often times distort the market rates for water and drives up prices for those who would normally like to continue purchasing water.

- **Improved & Simplified Monitoring** – the number of vouchers collected shows how the water is being collected. The vouchers themselves can contain beneficiary information to further monitor individual collection of water. Monitoring of water quality (free residual chlorine levels) still needs to be fully monitored and must not be forgotten.
- **Increased Choice for the Beneficiaries** –beneficiaries can also choose how they want to utilize or distribute their water – give to family members, animals, neighbours, etc.

The contract agreement between Oxfam and the service provider should specify the following:

- Quantity of water to be delivered;
- Quality of the water to be delivered (source of water, any necessary treatment, etc.);
- Frequency of deliveries to ensure timely collection of water by beneficiaries.

For further guidance, see the Somalia WASH Cluster Guidelines for Water Provision through Vouchers (2011).

Case Study: Somaliland, Somalia 2011.

Water provision was provided through vouchers in more than 30 drought-stricken villages. Targeting was community-based, and vouchers distributed to targeted beneficiaries (confirmed through a publicly-read roll call) on a weekly basis – the weekly voucher provided a fixed quantity of water based on 1 week’s water requirements for a household (Based on 7.5 liters/person/day for an average HH of 6 people, one HH was entitled to 315 L per week).

Water vouchers were purely given to women because of the gender role in water collection and hygiene at domestic level. This decision was community-based as water was not being provided for livestock.

Each village selected their water vendor (the vendor they most trusted). The beneficiaries surrendered their voucher to the water vendor after they collected their weekly ration; the water vendor then took the voucher to the money vendor for payment (upon verification from the implementing partner).

All water was supplied from boreholes. For HH treatment, the beneficiaries were given aquatabs and trained on how to use them. There was continuous public health promotion, follow up and monitoring to ensure compliance.

The voucher has a serialized counterfoil which was used to countercheck that the vouchers from the field are genuine. The water vendor was provided with the list of beneficiaries, which was used to record the daily volume of water collected by each household. Beneficiaries were sensitized on their weekly allocation and signed against their names, recording the volume of water collected each day. The community had an agreement with the vendor regarding the day and time of delivery.

The implementing partner paid regular monitoring visits and held discussions with beneficiaries to collect feedback. The evaluation was done internally (mid-way through the project) and externally upon completion of the project.

Accountability was ensured in the following ways:

- the vendor was only paid upon verification of delivery;
- the community had the power to terminate the services of a water vendor in the event of non-performance.
- Various FGDs and public meetings were held at community level. There was biweekly meeting with stakeholders (local leaders, government line ministries) to review the progress.

There were reports that some elderly women lost their coupons, but there was a register at the village level (which beneficiaries used to check off their water collected) which was used as a backup in these cases. Weekly distribution of vouchers reduced these incidences. In the end, over 95% of vouchers were redeemed.

In terms of acceptability of the voucher methodology:

- Provision of water vouchers was the strategy endorsed by the Somalia WASH Cluster;
- other NGOs (SOMTRAG, COOPI) were using the same methodology;
- The local authorities embraced the approach;

Feedback from the water vendors was also positive – they preferred to working in geographical areas they already knew well, and they received their payments on a weekly basis (through the money vendor), which was much faster than previous interventions where Oxfam and/or the partner were directly operational. They also appreciated that the voucher was self-regulating – they receive payment based upon what is delivered, and it was the beneficiaries who essentially managed their performance.

Oxfam and partner staff reported that the logistical workload was substantially less than a directly-implemented water trucking intervention. They also reported that this methodology could be utilized in insecure areas and managed remotely. The overall view of the staff was that this methodology is ultimately more transparent and empowers communities.



Figure 3 Water Voucher. In the background is the log book indicating the quantity of water taken by beneficiaries on a daily basis.

Alternatives to Water Trucking

Rehabilitation/Repair of Existing Water Sources

In areas where there are existing water points that are not operational, repair and maintenance of these facilities should be the priority intervention.

Fuel & Cash Subsidies to Boreholes

In areas where the population has access to commercially sold water at boreholes but purchasing power has declined, subsidies (typically fuel) can be given to the borehole management structures in order to lower the price of water to customers, or even to provide it for free during times of extreme duress. The goal is to maintain the price of water at a cost that the targeted population can afford, or provide it for free during times of extreme crisis. Providing free fuel, which can be interpreted as the same as providing

free water, requires a strategic exit strategy. This could be related to the rains arriving, or integrating the free fuel together with income generating activities, destocking (if appropriate) and cash via vouchers, cash for work etc. This is typically the preferred approach where the water needs of mobile pastoralists are a concern.

Requirements:

- Sufficient water points within a reasonable distance of the target population;
- Targeted population has cash available to purchase water at the subsidized price;
- Agreement with the borehole management structure on the subsidized price of water.
- M&E and Accountability - regular interviews to ensure water is supplied free.

Case Study: Wajir, Kenya 2011.

Wajir County was one of the most severely affected areas of Kenya during the 2011 drought. While water trucking interventions were implemented in settlements where no permanent water source was available, assessments showed that people living near boreholes lacked money to purchase this water. As the primary running cost impacting on the price of water was the diesel needed to power the generator-driven borehole pumps, Oxfam partners provided free diesel fuel to the Water User Associations that managed these boreholes. In exchange, water at these boreholes was provided to users free of charge.

The fuel subsidies were not provided to all boreholes, but were provided in order to achieve equal coverage per geographic area. The quantity of fuel to be provided to each borehole was estimated based upon load calculations (size of the generator and the load at which the generator is operating) which provides an estimate of consumption by KiloWatt-hour. Initial rapid estimates were based on partner experience and later checked by these load calculations

While the water was free for beneficiaries, any water trucks that utilized these boreholes were not a part of the subsidy process and were expected to continue paying for water. The District Water Offices (part of the Kenyan Government) were informed of the objective of the intervention such that they could support to ensure that users were not charged for the water.

The fuel subsidies were done in parallel with an intervention done by another Oxfam partner, which provided rapid maintenance and repairs to boreholes; in this way their continuous operation was ensured.

An initial analysis of the fuel subsidy intervention, compared to the direct water trucking also done in Wajir, showed the following:

	Emergency Water Trucking (Direct Implementation)	Provision of Fuel Subsidies
Number of Beneficiaries Reached	80,000 people	250,000 people + livestock
Quantity of Water Provided	7.5 liters/person/day	Unknown, though anecdotal evidence suggests that people were accessing quantities of water comparable to non-drought periods
Cost/person/month	660 Kenyan Shillings	220 Kenyan Shillings

Contingency Boreholes

Contingency boreholes are boreholes drilled in distant grazing areas with good pasture but insufficient water, or areas that suffer from extreme water scarcity during times of drought. These boreholes are only operated in times of drought to meet the increased demand of pastoralists (in distant grazing areas) or to fulfill the requirements of emergency water trucking interventions. They are then dismantled during non-drought periods, as they are not to be utilized as permanent water source, so as not to attract a settled population in their vicinity and destroy grazing areas. They can be quickly outfitted with a pump and generator during times of increased water needs.

Disadvantages:

- Difficult to enforce their dismantling during non-drought periods
- Often times used by politicians in order to settle communities.

Development of Groundwater Sources

The development of groundwater sources in areas of unreliable rainfall can be an alternative and, sometimes, cost-effective method of providing water. Construction of boreholes with pumping systems, for example, can often at times prove to be cheaper than a large-scale water trucking operation. Boreholes can be sited in areas with poor spatial distribution of permanent water points, at strategic locations along important pastoralist migration routes, or at strategic locations which would reduce water trucking distances.

The requirements for groundwater development include sufficient groundwater potential (often a problem in ASALs) and sufficient groundwater quality (significant areas of the ASALs in HECA have saline groundwater). Even in areas of sufficient groundwater potential, the drilling of boreholes is a complex issue due to the following issues:

- The sustainability of the water sources needs to be considered – not only in terms of operation and maintenance, but in terms of the groundwater source itself – potential extraction rates versus aquifer recharge;
- Groundwater in many areas of the ASALs tends to be saline; a thorough hydro-geological analysis is required;
- The development of groundwater sources in pastoralist areas needs to be carefully planned in terms of their proximity to grazing areas and migration routes. Boreholes in various areas of the ASALs in HECA have led to pastoralists bringing their livestock to these water points, resulting in over-grazing and severe degradation of the surrounding pasture. There have also been cases of these permanent water points encouraging the settlement of formerly nomadic pastoralists. Physical enclosure of land around water points (land formerly used as pasture/grazing areas) has also been witnessed. In short, the creation of new boreholes in pastoralist areas requires a high level of consultation with local stakeholders, a thorough understanding of the dynamics of the various livelihoods groups in the area and appropriate locations for watering of livestock (e.g. earth pans).

Other options for access to groundwater which may be preferred to the drilling of boreholes include:

- Deepening existing hand-dug wells;
- Development of new hand dug wells;
- Development of lined wadi wells.

Cash for work

In areas where water is commercially sold but people lack purchasing power, cash for work (CFW) can provide cash for people to continue to buy water in their normal way. CFW should target the most vulnerable, and a prerequisite for this intervention is the presence of sufficient water vendors in the area of intervention.

The Somalia WASH Cluster guidelines recommend that CFW be used in areas where there is existing water infrastructure to rehabilitate (water pans, birkads, shallow wells, etc.) and no permanent water sources exist. Some challenges to CFW inherent to ASALs include:

- A CFW intervention must be done in a timely manner – at the beginning of the drought period when people still possess the strength to work, and when water is still available commercially in sufficient quantities;
- The ASALs are typically sparsely populated, and the location of the CFW work sites needs to be considered in terms of their proximity to the targeted population.

Public health promotion strategies specific to water trucking

Public Health Promotion (PHP) in a drought context is extremely challenging, as the lack of water severely limits the potential hygiene practices that can be targeted. As the population is spread over a large area, and sometimes semi-nomadic, communication of key messages is a challenge as well.

For water trucking interventions, the key PHP activities must be practical and relevant to a context of water scarcity, and focus on actions and practices that are feasible to the target population. Key messages and activities are focused around the safe water chain and environmental cleanliness. This includes:

- Fencing of water point perimeters using locally available materials to ensure animals are kept at a safe distance;
- Cleanup campaigns around the water distribution point and the homestead;
- Use of safe collection containers for collection of water;
- Use of safe water storage containers in the home;
- Household level water treatment (Aquatabs or similar) if chlorination of water is not performed at the source or the storage vessel.

Key activities are:

- Cleaning and repair of mass water storage tanks
- Environmental cleanup campaigns which target water trucking distribution points, schools, clinics and communal meeting areas. Cleaning kits can be distributed for this activity, and it is potential opportunity for Cash For Work;
- Distribution of safe water collection/storage containers; (only if appropriate or during a diarrhoeal outbreak where the majority of water containers are in poor condition to be properly cleaned);
- Actions and messaging around use of latrines should be avoided in the drought context. The lack of latrines in these areas is a chronic issue, and their effectiveness in a context of water

scarcity is questionable at best. Instead, focus should be put on the promotion of safe disposal of faeces through the following methods:

- having demarcated areas for human defecation;
- defecation away from water sources;
- covering faeces with sand/soil (cat method);
- prevention of animals grazing where humans have defecated.
- Messaging around using the trucked water only for drinking and cooking purposes only;
- Messaging around early treatment of diarrhea, e.g. preparation and use of sugar salt solutions.

As messaging is challenging in such a widespread and sparsely-populated area, the following are methods appropriate to the ASALs:

- Radio broadcasts in local languages;
- Skills development of the Community Own Resources Persons (CORPS) - water user association members, community health workers, water tracking monitors and traditional birth attendants;
- Targeted messaging to captive audiences and the most vulnerable – food distribution sites, feeding centers, health centers, schools, water distribution sites, etc.;

The key to effective public health promotion is not only the content of the messages, but more importantly, the motivation behind putting these messages into practice. The identification and use of community members who already utilize these practices is a key component of the success of any PHP programme.

Monitoring the impact and effectiveness of the PHP activities is accomplished through a variety of facets:

- Post NFI distribution - house to house
- Segregated FGDs
- Observation of weekly environmental cleaning activities
- Direct observation of cleanliness around water points
- Transect walking around the settlements & water distribution points.
- Observing status of water storage containers,(jerry cans) at household level.
- Follow-up on action plans after training of CORPS who seem to have taken up their roles and responsibilities in organising weekly cleaning (around water points, dwellings and jerry cans)
- WASH related diseases at community level.
- Morbidity data collection on WASH related diseases (especially diarrhoea and Malaria) – from January to date – to determine the trends and therefore design suitable interventions

Case Study: Wajir, Kenya 2011

The PHP team the Wajir drought response constructed a PHP programme to complement water trucking activities during the 2011 drought response. Several planned PHP activities were rejected by the communities:

- Jerry can cleaning campaigns – communities became upset when additional water was supplied to clean jerry cans – they insisted that any additional water should be made available for consumption. Jerry can cleaning campaigns were adapted to promote their cleaning through the use of sand and pieces of gunny sacks, which was accepted more widely by the communities;
- Chlorination of water in the storage tanks – communities rejected the chlorination of water as they disliked the taste of chlorine. In order to ensure mitigate the risk of water contamination, promotion of other links in the safe water chain (safe storage and handling of water) was heavily emphasized.

The activities that proved most effective in the communities were environmental clean-up campaigns (specifically around water points) and promotion of the safe water chain.

MEAL (with remote programming context in the pastoralist context)

Activities/indicators that require monitoring in an emergency water trucking intervention include:

- Delivery of water – quantity & timeliness;
- Household-level water usage (quantity, uses, etc);
- Equitable distribution of water;
- Water quality;

Regular follow up on access to water shall be done through household visits and FGD's, disaggregated by gender, wealth group, ethnicity and social status (if possible).

Monitoring of Water Deliveries:

The quantity of water delivered, as well as the timeliness of deliveries, is essential to monitor correctly. These can be monitored through a variety of methods:

- Waybills – copies given to: water vendor (selling water to the water tanker), water tanker operator, and Oxfam staff.
- Monitors – either paid or volunteer, monitors are present: at the water source, at the distribution point, and/or travelling with the water tanker itself. These monitors ensure that water deliveries are made to the specified locations in a timely manner, and that the correct quantity of water is delivered. Monitors record this information and report it back to Oxfam staff.
- PHP staff & volunteers – PHP staff (and by extension the community-level volunteers that they work with) can monitor deliveries of water (quantity and frequency) as part of their normal monitoring system within the community.
- Programme Staff – in Wajir, Kenya in 2011, each of the local NGO partners that Oxfam worked through employed 1 water trucking monitor – their job was to visit all distribution points, and confirm water deliveries through the checking of waybills, discussions with community members, and communicating with the water tanker owners/drivers.
- Monitoring of water tankers – random stopping of water tankers to question them on number of trips completed & quantities of water delivered (checked against water delivery schedule, waybills and FGDs at community level).
- Setting up of feedback / accountability mechanisms which enable the targeted communities to communicate with Oxfam staff, and /or partner staff e.g. communicate delays, water quality/ quantity concerns, and during the onset of the rains.

Monitoring Distribution at Water Delivery Points:

- Use of monitors or local committee to record/control beneficiaries who are taking water and the quantity taken.
- In a voucher system, vouchers are redeemed by beneficiaries for a pre-determined quantity of water;
- Household visits are essential in order to monitor the quantity of water received per household and water quality.

Disaster Risk Reduction/Drought monitoring and Mapping

In the time prior to the drought season, in areas where EWT has been carried out previously, the following should be recorded and mapped:

- Location of potential water sources;
- Location of planned water trucking distribution points;
- Location of key pastoralist grazing areas;
- Location of potential water storage infrastructure.

A map developed using these key criteria, among others, aids in giving an overview of the area to be served by water trucking and, by displaying distances and locations, aids greatly in the development of a water trucking schedule.

As previously mentioned, seasonal calendars and “crisis calendars” should be consulted in terms of the appropriate timing of interventions, and possible mitigation activities prior to the onset of severe drought, in order to minimize the need for emergency water trucking.

Cross border

Particularly in the ASALs of the Horn of Africa, cross-border monitoring is essential to understanding current and future needs. As the large pastoral populations migrate across country borders to access grazing areas and water sources (or due to a lack of grazing areas and water due to drought in their normal areas), unforeseen fluctuations may occur rapidly in terms of water demand. In operational areas near international borders, it is essential that assessments & monitoring take into account migration patterns or population movements from cross-border areas (particularly relevant if Oxfam or Oxfam partners have operations in the cross-border areas).

Phased exit strategy

One of the primary obstacles to an effective EWT intervention that does not create dependency and undermine existing community coping strategies is a clear and well-defined exit strategy. Criteria for exit strategies from EWT guidelines in the region recommend the following:

- Clear indicators must be defined in order to decide the beginning *and* end of any EWT intervention;
- Exit strategy must be anticipated before beginning any EWT intervention;
- This exit strategy must be clear and agreed upon by local stakeholders and beneficiaries;

The reality is that a sustainable exit strategy in ASALs is a major challenge for the following reasons:

- Lack of clear indicators to define *when* and *how* EWT activities shall cease
- Sustainable exit strategies are not possible in some areas of the ASALs. Some areas have no ground water potential or potential for any type of permanent water source – what is the exit strategy in such a location?
- Short-term funding cycles from donors sometimes do not allow for long-term exit strategies.
- A lump sum for water trucking is often included into the proposal budget, without real actual consideration of the full contents and associated cost of a strategic water trucking programme (e.g. 1 month water trucking to a ?? population of ?? locations, inclusive of fuel, operators, drivers, rental of trucks, water testing equipment, water treatment chemicals, IEC materials etc).

Various exit strategies exist for water trucking interventions:

- In areas where there are non-functioning water points that can be repaired or rehabilitated, the first priority should be to make these points operational and exit from water trucking operations immediately thereafter; interventions can then shift to supporting Operation and Maintenance (O&M) of these water points;
- Creation of new water points – this mostly refers to the creation of new boreholes in strategic locations (areas receiving the larger majority of water trucking, areas with no permanent water points, pastoralist migration routes);
- Ceasing of water trucking interventions upon the start of sufficient rainfall to fill surface water collection structures (earth pans, dams, etc.). The danger here is that rainfall in the ASALs is erratic and sometimes suffers from poor spatial distribution; some areas may go years without significant rainfall.

Exit strategies for EWT, often times due to short-term funding cycles, focus on short-term solutions; however, truly effective exit strategies require long lead times to address the variable nature of water supply & demand in ASALs.

In areas where a tangible exit strategy is not feasible, the appropriateness of implementing water trucking activities should be seriously considered. Water trucking should only be considered where no alternative viable solutions exists in terms of meeting immediate needs.

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