

Challenge Candidate List - Surface Water Drainage in Emergencies

This working document is a summary of the key challenges presented in the WASH Problem Exploration Report on Surface Water Drainage in Emergencies.

Phase	The Challenge	Innovation Needed	Type of intervention	Who will use it?	Existing Work
Before an Emergency: New Camps					
	Identify the ideal places to set camp sites so that they do not pose surface water drainage problems in either the short or long term.	Risk Assessment Tool that pulls together hydrological data, weather data, geographic data (e.g. soil type, inclination), data about existing physical infrastructure (e.g. buildings or existing drainage), available relief agencies and local technical capabilities, public health hazards (e.g. predominant diseases and infections), data about the community that will inhabit the camp (e.g. numbers, cultural characteristics/ traditions).	Call for research and development proposals.	Humanitarian agencies (international or national) responsible for setting up and managing camp sites during a crisis situation (e.g. UNHCR).	Standard protocols exist, but would benefit from improvements by integration with localised data.
	Identify the most appropriate and context-relevant drainage solution for a camp site.	Guidance documentation on which drainage approach is the most relevant depending on contextual factors such as location, climate, flood/drought risks, available skills and resources.	Workshop with key stakeholders in the field to understand current decision-making processes, and to evaluate the likelihood that resulting guidance documentation will have an impact on drainage strategies.	Humanitarian agencies (international or national) responsible for setting up and managing camp sites during a crisis situation (e.g. UNHCR); civil and water engineers responsible for the camp surface water drainage design and implementation.	There is a lack of context-specific recommendations as field research focusing on surface water drainage is lacking.
Before an Emergency: Existing camps					
	Assess the functioning of existing water drainage facilities (e.g. wastewater and stormwater drains).	Clear and contextualised protocols for assessing the functionality of existing water drainage facilities at a camp site.	Identify key partners to develop the protocol (e.g. research institutions, practitioners, NGOs). The partners will be expected to test their protocols in the field.	Humanitarian agencies (international or national) responsible for managing camp sites (e.g. UNHCR); water engineers; WASH actors; in collaboration with people living in camp sites.	The assumption is that there is a protocol, but it is not being implemented because of a lack of urgency or missing/unclear follow-up actions.
	Assess whether existing water drainage facilities are sufficient.	A tool for assessing the probability of future hydro-meteorological extremes, as well as the likelihood of existing drainage facilities to cope with these extremes.	Identify key partners to develop the tool (e.g. research institutions, practitioners, NGOs). The partners will be expected to test the tool in the field.	Humanitarian agencies (international or national) responsible for managing camp sites (e.g. UNHCR); water engineers; WASH actors; in collaboration with people in camp sites.	The assumption is that there is an existing tool but it is not used because of the lack of urgency associated with surface water drainage; lack of follow-up actions.
	Improve existing drainage systems that are no longer working or that are not sufficient.	Guidance on what are the best practices to repair or improve an existing drainage system.	Workshop with practitioners and innovators to understand how to best support repair work.	Humanitarian agencies (international or national) responsible for managing camp sites (e.g. UNHCR); water engineers; WASH actors; in collaboration with people in camp sites.	There is existing guidance but this is not adapted to emergency contexts. This is likely due to perceptions of low urgency and limited finances.
	Ensure that drainage around existing water facilities (e.g. water taps, water pipes, sinks, toilets) is effective.	Checklist for verifying suitability of existing solutions and suggestions for simple and effective drainage solutions.	Identify key partners to develop the checklist (e.g. research institutions, practitioners, NGOs). The partners will be expected to test the checklist in the field.	Most likely relevant for WASH agencies and camp site management.	There are general guidelines but more context-specific solutions derived from field research are needed.
	Assess the likely drainage vulnerabilities on site. The ability to assess the drainage vulnerabilities of a site (including the effectiveness of existing facilities and potential flood risks) would be extremely beneficial.	A tool that allows assessment of drainage vulnerabilities, taking into account existing drainage systems and their limitations, and the existing physical infrastructure of the camp (e.g. space available and existing buildings).	Call for research and development proposals.	Primarily humanitarian agencies (international or national) responsible for setting up and managing camp sites (e.g. UNHCR) during a crisis situation; civil and water engineers responsible for the camp surface water drainage design and implementation.	Standard procedures exist but they fail to take into account contextual factors.
During an Emergency					
	Improve capacity to choose the best drainage solution to use in the case of an emergency.	Guidance on how to choose the best drainage solutions during an emergency. This should be context-dependent and take into account the available resources (e.g. high-tech or low-tech solutions), as well as the existing infrastructure, geography and potential use of the surface water. This should focus on sustainable solutions.	Identify/Call for partners to develop guidance (e.g. research institutions, practitioners, NGOs). The partners will be expected to test the guidance materials in the field.	Agencies responsible for the camp management; water engineers.	There is existing guidance but it does not take into account local camp factors; context-specific guidance is needed.

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	Repair or adapt a faulty existing drainage system in the case of an emergency (e.g. urban settings; Port-au-Prince, Haiti).	Recommendations on how to make use of existing drainage systems in an emergency (e.g. repairing damaged systems rather than building them from scratch).	Identify/Call for partners to develop recommendations document (e.g. research institutions, practitioners, NGOs). The partners will be expected to test the resulting document in the field.	Agencies responsible for the camp management; water engineers.	There is limited research on how to make use of existing systems; additional field studies are required.
	Diminish the risk of developing vector breeding sites in the case of poor surface water drainage.	Field research to assess the correlation between different drainage practices and possible vector pathways.	Call for field research projects.	Agencies responsible for the camp management; WASH agencies; people living in the camp sites.	There is limited research into the correlation between drainage practices and vector development; field-research is needed to assess this in different camp settings using different drainage systems.
Maintenance					
	Encourage the local community to maintain existing drainage systems.	Provide appropriate training and equipment (e.g. shovels, buckets, water-proof boots, overalls) for those living in the camps to carry out ongoing maintenance.	Call for agencies to develop and trial training programmes that include people living in the camps in ongoing maintenance of drainage systems (e.g. cash-for-work schemes).	Agencies responsible for the camp management, WASH agencies and people living in the camp sites.	These measures exist but are not implemented consistently across camp sites or throughout longer time periods; there is a lack of motivation to take part.
		Campaign to promote behavioural changes around the use of water taps or pipes and prevention of excessive water spillage, as well as education around the safe storage of water and disposal of greywater.	Call for behavioural change agencies to work together with WASH practitioners to develop campaigns to prevent excessive water spillage and safe water storage.	WASH providers to train people living in camp sites.	There is little research around the impact behavioural changes regarding water storage, use and disposal would have on reducing the pressure on surface water drainage systems.