

DISCUSSION PAPER

**WATER, SANITATION AND
BEHAVIOUR CHANGE FOR
SCHISTOSOMIASIS-ENDEMIC
COMMUNITIES**

July 2020



I. Background

Water, sanitation and improvement in associated behaviours are acknowledged as crucial to the prevention, control and eventual elimination of schistosomiasis. Yet the specific interventions required to achieve the necessary levels of access to infrastructure, and the most effective behaviour change approaches, have not been clearly established and implemented in the context of schistosomiasis control programmes. This is due in large part to the complex epidemiological profile and transmission cycle of schistosomiasis, the highly focal nature of disease distribution, and the variation in transmission contexts for the different schistosome species and in different water contact behaviour profiles across different community settings.

Conditions that sustain transmission may be highly localised, necessitating a localised approach to water and sanitation service provision; this in turn may result in the need to provide small-scale services at higher than average cost. Additionally, certain behaviours that enable schistosomiasis transmission, particularly contact with contaminated surface water, are often intractable as they are either very difficult to change from a behavioural perspective or due to economic imperatives, necessitating a nuanced approach that focuses on risk reduction rather than risk prevention.

Based on these considerations, it can be assumed that a 'blueprint' approach to water, sanitation and behaviour change programming that does not respond to the specific local context is unlikely to result in uptake and use of infrastructure and in sufficient shifts in behavioural practices in endemic communities. Consequently, it is unlikely to deliver and sustain reductions in disease transmission.

This approach paper has been developed by the SCI Foundation to inform its engagement with Ministries of Health in schistosomiasis-endemic countries, as well as to inform debate and development of preferred practices within the global schistosomiasis community.

This is an emerging approach, which will continue evolving as SCIF expands its work in this area and as the various components set out in the document are applied and evaluated in the programmatic context.

What is schistosomiasis?

Schistosomiasis, also referred to as Bilharzia or Snail Fever, is a disease caused by parasitic flatworms (schistosomes) transmitted between humans/animals via freshwater snails acting as intermediate hosts. Several animal and human species of schistosomes exist, with the main species of schistosomes infecting humans being *Schistosoma haematobium* (causing urogenital diseases), *Schistosoma mansoni*, and *Schistosoma japonicum* (both causing intestinal schistosomiasis).

The disease results in different morbidities, depending on the species involved. Urogenital morbidities (caused by *S. haematobium*) include bladder pathology and female genital schistosomiasis, while intestinal schistosomiasis (caused by all other species) can lead to enlargement of the liver and spleen.

II. Why a defined ‘approach’ for schistosomiasis control is needed

The past few years have seen a shift in the global approach to schistosomiasis, as well as other Neglected Tropical Diseases (NTDs), away from the sole focus on programme coverage of mass treatment in high prevalence populations to interrupting transmission, reducing the severity of morbidities, and achieving elimination as a public health problem. This shift is most prominent in the targets set under the draft World Health Organization NTD Roadmap, in which schistosomiasis is targeted for elimination as a public health problem.

This change implies a strong need for a viable intervention ‘package’ for schistosomiasis control and elimination, comprised of context-relevant interventions, to inform programme design, collaboration across different sectors, and policy change. Such an approach can also help identify common objectives with other disease control and public health programmes, as well as entry points for collaboration, coordination, and integration.

The approach can be used to:

- Inform technical support to Ministries of Health and other health implementers wishing to engage with the WASH and sectors for schistosomiasis prevention
- Inform local level participatory planning for sustainable disease prevention and improved access to services
- Use information on schistosomiasis transmission to
 - influence the design, trajectory and access levels of existing WASH and behaviour change programmes so that they become more “schisto-sensitive”, as in many cases, low-cost WASH options may not address crucial transmission pathways, and
 - where needed, developing novel context-relevant WASH solutions
- Contribute to cross sector collaboration within the NTD, health and development community.

The approach is complementary to, and should be used in conjunction with, existing guidance and manuals, in particular:

- [WASH and Health working together: a ‘how to’ guide for NTD programmes](#) (WHO and NNN, 2019)
- [Guidance on Programming for Rural Sanitation](#) (Plan, Unicef and WaterAid, 2019)
- [Guidelines on Sanitation and Health](#) (WHO, 2018)

III. Water, sanitation and behaviour approach

1. Identification of target location

Given the highly focal nature of the disease, specific communities or locations will need to be identified. When using this approach for the first time, it is advisable to start with a limited number of communities/locations, to test the approach and gain evidence and lessons for scaling up.

Specific locations for implementation of the approach should be identified by the national programme, based on several factors, including:

- a. The prevalence of disease¹
- b. The levels of access to safe or improved water and sanitation infrastructure
- c. The likelihood that improved WASH will contribute to reduced transmission (noting that individuals may be exposed primarily when away from their community)
- d. The scope of available resources and existing coordination between the schistosomiasis control programme and water and sanitation implementers.

2. Participatory appraisal²

Once a location has been identified, the first step should involve bringing together the community in a discussion to identify the key problems and possible solutions relating to disease transmission in their setting. The discussion or series of discussions should take place in the local language, involve community leaders and other key stakeholders (local teachers, health workers/volunteers) and be driven by the community's needs and priorities. Service providers such as local water and sanitation authorities, should also be involved; this can help engender trust between the community and service providers while helping to ensure that services are provided more quickly and reliably. Where resources allow, this process should be planned with input from social scientists familiar with the local context, to inform the specific methods and activities.

The participatory appraisal process can be used to answer the following questions:

- a. **What are the main characteristics of this specific transmission context?** These characteristics influence not only the risk of transmission and infection, but also the uptake, sustainability, and potential impact of interventions.
 - Type of community (size, rural vs urban, temporary vs permanent)
 - Environmental, seasonal and ecological context

¹ Given that the scale of mapping surveys tends to take place at the district level, further consultation will be needed with district and sub-district staff to identify specific communities, at least until lower-scale information becomes available

² A participatory appraisal is one term among several used to describe a process by which people play an active and influential part in decisions which affect their lives. In the SCIF approach, we assume that such a process is crucial both to engage communities in disease prevention, but also to enable necessary local innovation. More information on participatory methods and tools is available at <https://www.participatorymethods.org/page/about-participatory-methods>.

- Socio-economic conditions (social composition, family structures, economic activity relevant to schistosomiasis, housing and infrastructure, income level, occupations)
 - Other infectious diseases linked with similar environmental and social conditions that are likely to be present in this context.
- b. Where does infection come from and why?** It is essential to ascertain where transmission occurs to determine the necessary intervention. Crucially, individuals may be exposed to infection away from the community or exposed to multiple water bodies. Exposure may not necessarily be taking place in the most obvious locations. Participatory mapping of bathing, washing, water fetching and open defecation areas may be a particularly useful way to identify potential transmission and exposure sites and their relative importance. Where possible, this should be accompanied with small-scale snail mapping to establish the degree to which each water site poses a transmission risk. Participatory mapping, potentially with different social groups within the community, should take place with minor inputs from the facilitator to allow for richness of information and avoid bias.
- c. What can be done?** The degree to which the community buys into the emerging solutions will determine their success. It is therefore crucial to ensure that community members can share their ideas as to what can and cannot change (for example, water use patterns that are linked to livelihoods), what can change subject to increased access to services (such as using safe water supply instead of surface water), and what can be done. This also provides the opportunity for local technological innovation and adaptation.
- d. Who needs to do what?** The process should culminate with a clear action plan, setting out the roles and responsibilities of the community, government agencies, service providers and other implementation partners such as local NGOs.

3. Implementation of a 'package' of infrastructure and behaviour change interventions

Based on the above information, it is possible to propose potential '**package**' of technologies and behaviour change interventions (detailed in the next section) that may be relevant to the context, or to rule out those that are least relevant or that may not be suitable for this context. The emphasis on the package should be on supporting efforts to achieve universal access to safe water and sanitation services, towards improving overall public health and wellbeing (rather than just on schistosomiasis control).

Water supply technologies:

The usefulness, adoption and sustainability of water supply interventions depends, among others, on the following aspects. These can be identified through the participatory appraisal, as well as through data from government and secondary sources.

- **Current levels of access** to water supply including functionality (is safe water available 24/7?) and use patterns (does the source and amount of water vary seasonally?)
- **Use types:** drinking and domestic (cooking, cleaning, laundry, bathing) purposes exist in all settings, while productive (irrigation, fishing, aquaculture, agriculture) and recreational uses vary significantly. Uses determine both exposure (human contact with contaminated water) and transmission (schistosome eggs entering water through urination in surface water, laundering soiled clothing in surface water, etc).
- **Sustainability:** availability of technology and its materials and spare parts in local markets and ability to deliver cost effective, long-term supplies without complex maintenance or costly components or chemicals.
- **Affordability** for households or the community.

- **User preferences** (e.g. household or communal laundry facilities, preferences as to the taste/odour/colour of the water³)
- Location/convenience and yield of potential **groundwater** as an alternative to contaminated surface waters.
- **Demand** from local resellers and local water and sanitation agencies, as well as competing demand from producers and manufacturers.
- **Water storage and treatment** practices and strategies currently applied.
- **Water source management structures** at the community and district level, including water quality and vector breeding surveillance.

Implications for drinking/domestic water supply interventions in all settings:

- Undertake **survey** of available water sources and their functionality/use to explain patterns of water use at all seasons (including groundwater abandonment due to poor functionality, cost, aesthetic/taste and other preferences)
- Implement measures to increase quality, functionality and capacity of **existing systems** (borehole/pump rehabilitation to reduce continued reliance on unimproved sources) to improve uptake of improved water supply throughout the year.
- Increase access to convenient **infrastructure for bathing and laundry** that meets user preferences
- Encourage water vendors who source water from cercariae-contaminated water bodies to **treat the water** before distribution in containers (e.g. by adding sufficient chlorine).
- Where no water supply infrastructure exists, consider the following **technology options** (these require external investment in capital and maintenance cost):
 - Low-cost/high yield: spring protection, protected hand-dug well
 - Medium cost/yield: protected hand-dug well, tube well, borehole + hand pump

Sanitation systems and technologies:

The sustained use, adoption and sustainability of sanitation facilities, as well as the likelihood that facilities will reduce transmission, depends, among others, on the following aspects. These can be identified through the participatory appraisal, as well as through data from government and secondary sources.

- **Current levels of access** to sanitation services across entire sanitation service chain (toilet, containment/storage, conveyance, treatment and end use/disposal), to ascertain the likelihood of schistosome eggs entering surface water.
- **Physical factors** that affect the choice of sanitation technologies, including population density, risk to groundwater used for drinking, water availability, soil hardness (difficulty and cost of pit excavation for latrines or septic tanks), soil permeability, land availability⁴
- **Enabling factors** for sanitation uptake and use, such as a) availability of low-cost technology options incl. supply chain; b) capacity for infrastructure construction, operation and maintenance; c) financial resources for construction, operation and maintenance for both

³ Such preferences have been shown to lead people to abandon uncontaminated groundwater sources in favour of contaminated surface water

⁴ See WHO Guidelines on Sanitation and Health, p53 for detail

<https://apps.who.int/iris/bitstream/handle/10665/274939/9789241514705-eng.pdf>

household and public facilities; and d) market considerations, such as for compost production and sale, if relevant.

- **Social context** for sanitation such as cultural preferences, ability/willingness to pay for hardware, and including judgement on desired or possible level of service provision (toilets for each household, shared between households, or public). This could also include legal aspects such as land tenure, local sanitation bylaws and landlord responsibilities.
- **National sanitation technology standards**, which will determine the type of technologies that can be legally used.
- **Treatment performance** of available technologies (efficiency in killing off schistosome eggs).

Implications for sanitation interventions in all settings:

- Avoid the use of 'hanging' toilets – toilets constructed directly over water bodies – as this can result in greater risks to public health than open defecation.
- Avoid the construction of basic pit latrines in areas that are flood prone or that have high groundwater levels.
- Ensure that social and economic conditions are relevant and amenable before establishing community-based demand led programmes (e.g. CLTS) and/or sanitation marketing (see WHO Guidelines on Sanitation and Health, p90).

Behaviour change:

Prior to developing behaviour change interventions, it is important to understand what behaviours take place in a given setting, and why (behavioural determinants). In the case of schistosomiasis, it is possible to make a distinction between two sets of behaviours:

- **Exposing behaviour** (exposing oneself (or one's child) through contact with contaminated water)
- **Transmitting behaviour** (excreting into the environment/water leading to risk of transmission to others).

The reason for this distinction is that these may be practiced by distinct sets of individuals, whose behaviours are driven by distinct considerations and who may be more usefully addressed through different channels with different messages. For instance, children who bathe in contaminated surface water, or contribute to water contamination through urination, have different reasons for doing so than people using surface water for fishing, and it may therefore be ineffective to address their behaviours through the same communication channels.

Additionally, it is important to understand **health-seeking behaviour** such as treatment coverage and uptake to provide adequate contextual information since barriers for treatment uptake may overlap with WASH-related behaviours.

The relevance and effectiveness of behaviour change interventions depends, among others, on the following aspects, which should be identified through the participatory appraisal proposal.

- **Behaviour context and drivers** such as the cultural and social setting, livelihoods, preferences, income, gender and age
- **Existing behaviour change interventions** at the community, school or population level, especially if these already address schistosomiasis prevention
- **Previous snail control measures** that may affect people's perception of the 'safety' of water bodies for recreational and other uses
- Availability of existing **formative research information** (existing behavioural studies undertaken in the same context) or ability to obtain it (for use in the design of behaviour change interventions)
- Availability of useful **entry points** for behaviour change communication, such as health outreach programmes and other community-based platforms.

Implications for behaviour change interventions⁵ in all contexts:

Exposing behaviours:

- Water storage and/or treatment to allow for die-off (ensure safe storage to avoid contamination with other pathogens) and improve taste/aesthetic

Transmitting behaviours:

- Mobilisation and promotion activities to encourage uptake of toilets to avoid water contamination.

IV. How the water, sanitation and behaviour intervention package may be applied to different setting ‘types’

This section applies the proposed implementation package to several potential types of transmission settings (these are locations in which transmission and exposure take place, and may or may not be actual communities. For instance, a fishing site may be used in different ways by members of different communities or villages and may or may not have people living in the location itself). Each setting is detailed in a table describing the potential characteristics of the setting, followed by a set of potential water, sanitation and behaviour change interventions **additional to those identified in the above section** (note that there is significant overlap between some settings). The setting types encompass contexts in which SCIF operates/will operate and is therefore restricted to schistosomiasis-endemic contexts in sub-Saharan Africa.

Caveats:

- This approach is a blunt instrument, allowing programme planners/advisers and policy influencers a greater degree of accuracy earlier on in the programme development stage. Detailed programme design, budgeting and implementation must still be based on a robust location-specific participatory appraisal, needs assessment and feasibility study, to take into account sustainability aspects such as affordability to users, engineering, operation and maintenance of infrastructure, and existing and new knowledge on behavioural drivers and motivators.
- Some population groups may alternate regularly between setting ‘types’. For example, people usually residing in permanent rural or urban settings (#5) may move regularly between this setting and permanent fishing camps (#2) or undertake seasonal migration for grazing purposes (#4).
- The WASH package should be used to inform coordination with agencies and government departments who deliver WASH interventions and assist joint planning processes with the objective to enhance the targeting of WASH services to endemic communities.

⁵ As there is currently insufficient evidence on the protective effect of soap/endod, this has been left out for now

1. Fishing (itinerant)	
Species: <i>S. mansoni</i>	
Environmental setting: Lakes, large water bodies	
Socio-economic aspects (ATP: ability to pay for HH sanitation; WTP: willingness to pay for HH sanitation) <ul style="list-style-type: none"> • Temporary; No legal 'community' status or land ownership by community residents; Lack of community cohesion due to transient nature (can undermine community-led approaches) • Poor housing, usually no toilets → open defecation likely • Possible migrant pop. (e.g. DRC ↔ Uganda) • Families may or may not be present • School-aged children (SAC) may not be at school (i.e. missed by both treatment and health education) • ATP/WTP: assumed low 	
Likely co-endemicity: Cholera, STH, Malaria, LF	
Exposing behaviours: [behavioural targets] <ul style="list-style-type: none"> • Entering water (in the shallows) for fishing/ domestic activities, or for use as toilet [fishermen, fishing households] • Recreational swimming [children] 	Transmitting behaviours: [behavioural targets] <ul style="list-style-type: none"> • Anal cleansing in/nr surface water [All community members] • Open defecation in/near water [All community members] • Washing soiled clothing in surface water [All community members]
Potential technology considerations (additional to those listed in section 3):	
Drinking/domestic water supply:	
Jetty construction into the water (if there is no vegetation inside the lake and if no deep-water snails are present); Vegetation clearing from shores/banks	
Sanitation	
<i>The socio-economic setting is unlikely to support community-based demand approaches (e.g. CLTS)</i> Subsidised technology options: <ul style="list-style-type: none"> • Public toilet facilities away from the water source with affordable fees (with offsite treatment or onsite treatment such as a basic septic tank with a leachpit for evaporation and infiltration), and linked with other useful services such as charging points, bathing facilities • Raised EcoSan – dependent on market for excreta/urine (suitable for rocky soil): Must be subsidised; Linked with business model; Accompanied by BC for management • Container-based sanitation (subscription service). If not subsidised, this is only an option for towns to enable business model and for scale to enable re-use in agriculture 	
Behaviour change	
Exposing:	
<ul style="list-style-type: none"> • Recreation: Identification of a designated (relatively) safer swimming area within the same lake/river, or alternative area (where ecologically there are fewer snails). Small measures can be used to make the area preferable for children • Promotion of PPE (gloves/boots for fishermen) [note: this may be appropriate for those loading/offloading boats but not those fishing due to fear of drowning] 	
Transmitting:	
<ul style="list-style-type: none"> • Mobilisation and promotion activities to encourage uptake of toilets, bathing and laundry facilities. Activities may require establishment of community outreach mechanisms and special targeted activities (particularly for seasonal migrants). 	

2. Fishing (fixed)	
Species: <i>S. mansoni</i> (and <i>S. haematobium</i> : transmission points through fishing in large permanent ponds such as in Zanzibar)	
Environmental setting: Lakes, large water bodies, rivers, dam lakes	
Socio-economic aspects (ATP: ability to pay for HH sanitation; WTP: willingness to pay for HH sanitation): <ul style="list-style-type: none"> Local (non-migrant) pop. Not all HHs own land Poor housing nr. fishing sites (mud, wood). Poorer Hs tend to be closer to water No toilets (soils by the shore may be too weak to support the pit, or too rocky to dig) Fishing camps: permanent in which fishermen congregate/live away from their families very close to the boat launch sites in the lake. Cultural beliefs may prevent toilet use Predominant use of surface water for HH needs Schooling available (and away from lake) ATP/WTP: ATP assumed low, WTP assumed moderate 	
Likely co-endemicity: Cholera, STH, Malaria, LF	
Exposing behaviours: [behavioural targets] <ul style="list-style-type: none"> Entering water (in the shallows) for fishing/ domestic activities, or for use as toilet [fishermen, fishing households, Youth loading/offloading fishing boats] Recreational swimming [children] 	Transmitting behaviours: [behavioural targets] <ul style="list-style-type: none"> Anal cleansing in/nr surface water [all community members] Open defecation in/near water [all community members] Washing soiled clothing in surface water [all community members]
Potential technology considerations (additional to those listed in section 3):	
Drinking/domestic water supply: Jetty construction into the water (if there's no vegetation inside the lake and if no deep water snails are present); Vegetation clearing from shores/banks	
Sanitation Subsidised technology options: <ul style="list-style-type: none"> Public toilet facilities away from the water source with affordable fees (with offsite treatment or onsite treatment such as a basic septic tank with a leachpit for evaporation and infiltration), and linked with other useful services such as charging points, bathing facilities Raised EcoSan – dependent on market for excreta/urine (suitable for rocky soil): Must be subsidised; Linked with business model; Accompanied by BC for management Container-based sanitation (subscription service). If not subsidised, this is only an option for towns to enable business model and for scale to enable re-use in agriculture Floating containers (for floating communities/islands only) – (e.g. HandyPod) only if container is completely sealed and options are available for safe transportation, emptying and treatment/end use 	
Behaviour change Exposing: <ul style="list-style-type: none"> Recreation: Water recreation area (swimming pool) can be considered where there is a single site for recreational use; where there is no water scarcity; where a reliable water supply can be put in place; where a management structure is feasible/ affordable; Identification of a designated (relatively) safer swimming area within the same lake/river, or alternative area (where ecologically there are fewer snails). Small measures can be used to make the area preferable for children Promotion of PPE (gloves/boots for fishermen) [note: this may be appropriate for those loading/offloading boats but not those fishing due to fear of drowning] Transmitting: <ul style="list-style-type: none"> Mobilisation and promotion activities to encourage uptake of toilets, bathing and laundry facilities. Activities may be linked with existing health outreach and school health education programmes. 	

3. Irrigated agriculture	
NB: This setting may be closely linked with #5. Where relevant, non-occupational behaviours (e.g. recreation, domestic activities) outlined in #5 should be considered alongside those outlined here.	
Species: <i>S. mansoni</i> and <i>S. haematobium</i>	
Environmental setting: Lakes (if using lake water for irrigation), seasonal/small water bodies, streams, dam lakes	
Socio-economic aspects (ATP: ability to pay for HH sanitation; WTP: willingness to pay for HH sanitation):	
<ul style="list-style-type: none"> • Permanent housing • HHs in proximity to irrigation schemes • Either own land or work for landowners • Heterogenous water sources • ATP/WTP: ATP depending on income; WTP possibly moderate depending on land ownership 	
Likely co-endemicity: STH, (TS and potentially neurocysticercosis)	
Exposing behaviours: [behavioural targets]	Transmitting behaviours: [behavioural targets]
<ul style="list-style-type: none"> • Standing in irrigation channels [Agricultural workers/ employers] 	<ul style="list-style-type: none"> • Anal cleansing in/nr surface water [Agricultural workers] • Open defecation in/near water [Agricultural workers] • Urination in/nr water [Agricultural workers] • Use of sludge (M)/urine (H) in irrigated agriculture [Agricultural workers/ employers]
Potential technology considerations (additional to those listed in section 3):	
Drinking/domestic water supply:	
<ul style="list-style-type: none"> • Additional technologies (require external investment in capital costs in low-income communities): <ul style="list-style-type: none"> ○ Low-cost/high yield: spring protection, rainwater harvesting, hand-dug well ○ Medium cost/yield: hand-dug well, tube well, borehole + hand pump ○ High capital cost – gravity supply • Irrigation: In systems diverting lake/river water into irrigation channels, consider installing snail barriers that do not interrupt water flow 	
Sanitation	
Provision of acceptable, appropriate and sustainable toilets for worker use at/near fields away from surface water and irrigation channels (and/or designated urination areas away from water).	
Behaviour change	
Exposing:	
<ul style="list-style-type: none"> • Promotion and provision of PPE (gloves/boots for workers), targeting both employers and workers and linking with other occupational health considerations, standards and legislation 	
Transmitting:	
<ul style="list-style-type: none"> • Encouraging urination/defecation away from water bodies 	

4. Nomadic	
This 'type' should be seen as dynamic rather than permanent – i.e. permanent communities as set out under #5 may undertake seasonal migration for livestock grazing purposes, during which the conditions described here apply.	
Species: <i>S. haematobium</i> and hybrid species	
Environmental setting: Seasonal/small water bodies, streams	
Socio-economic aspects (ATP: ability to pay for HH sanitation; WTP: willingness to pay for HH sanitation): <ul style="list-style-type: none"> • No permanent structures during migration (may be seasonal) including toilet facilities • Constant livestock presence • Cultural customs may prevent toilet use and/or sharing toilets among men/women • In some instances there may be negative experiences of infrastructure being used as a way of settling nomadic communities, potentially undermining uptake of new initiatives • School-age children not in school (may be attending schools for MDA only so may not be missed by treatment*) • ATP/WTP: both assumed very low • Official attitude to nomadic communities (is government ready to support that lifestyle and provide necessary infrastructure in many places?) 	
Likely co-endemicity: STH, Trachoma	
Exposing behaviours: [behavioural targets] <ul style="list-style-type: none"> • Small pond use – cattle watering, domestic activities (bathing, laundry) [All community members] • Small-scale fishing [All community members] • Recreational swimming [children] 	Transmitting behaviours: [behavioural targets] <ul style="list-style-type: none"> • Urination in/nr water [All community members] • Cattle watering [all community members]
Potential technology considerations (additional to those listed in section 3):	
Drinking/domestic water supply: <ul style="list-style-type: none"> • Water needs of livestock should be a key consideration alongside human water needs as these underpin uptake of safe watering practices. Construction of animal watering troughs near water bodies should also be considered. • Provision of alternative water sources for drinking, bathing and laundry near known campsites to reduce reliance on surface water 	
Sanitation Social investigation to understand sanitation practices and potential solutions (e.g. the WaterAid Niger Nomadine ⁶), potentially link to other infrastructure needs (electricity, roads for markets.	
Behaviour change Exposing: <ul style="list-style-type: none"> • Promotion of exclusive use of watering troughs for livestock (to avoid contact with contaminated water) [through veterinary clinics or outreach services) • Water storage and/or treatment to allow for die-off (ensure safe storage to avoid contamination with other pathogens) and improve taste/aesthetic Transmitting: <ul style="list-style-type: none"> • Promotion of exclusive use of watering troughs for livestock (to avoid zoonotic contamination) [through veterinary clinics or outreach services) • Encouraging urination/defecation away from water bodies [recommendations re desired sanitation practices needed as an alternative – e.g. if there is sufficient space and cover, OD/OU may not present a public health risk if it is done away from water bodies] 	

⁶ <https://knowledgepoint.org/upfiles/14968488768220913.pdf>

<p>5. Static rural/peri-urban</p> <p>This is a broad category encompassing all groups that do not fit into the other four 'types'. WASH options will depend on the specific settings within each community and the same process and considerations described above should be applied.</p>	
<p>Species: <i>S. mansoni</i>, <i>S. haematobium</i></p>	
<p>Environmental setting: Seasonal/small water bodies, streams; proximity to large water bodies and overlap in water source and uses</p>	
<p>Socio-economic aspects (ATP: ability to pay for HH sanitation; WTP: willingness to pay for HH sanitation):</p> <ul style="list-style-type: none"> • Permanent housing (varying quality), may be in extended family compounds • Subsistence farming • Basic water and toilet infrastructure available • Peri-urban agriculture (rice paddies, banana) • Peri-urban fishing • Access to schools and healthcare facilities • HH livestock (chickens, goats, pigs) • ATP/WTP: ATP dependent on income; WTP potentially moderate 	
<p>Likely co-endemicity: STH (TS and potentially neurocysticercosis), Cholera</p>	
<p>Exposing behaviours: [behavioural targets]</p> <ul style="list-style-type: none"> • Domestic activities (bathing, laundry) [All community members] • Livestock watering in surface water [All community members] • Water collection for small scale agriculture [All community members] • Ritual cleansing in surface water (before prayer)* [All community members] • Water collection for commercial activities (car washing, market stalls) [All community members] • Recreational swimming [Children] 	<p>Transmitting behaviours: [behavioural targets]</p> <ul style="list-style-type: none"> • Anal cleansing in/nr surface water [All community members] • Open defecation in/near water [All community members] • Washing soiled clothing in surface water [All community members] • Urination in/nr water [All community members]
<p>Potential technology considerations (additional to those listed in section 3):</p>	
<p>Drinking/domestic water supply:</p> <ul style="list-style-type: none"> • Additional technologies (require external investment in capital costs in low-income communities): <ul style="list-style-type: none"> ○ Low-cost/high yield: spring protection, rainwater harvesting, hand-dug well ○ Medium cost/yield: hand-dug well, tube well, borehole + hand pump ○ High cost – gravity supply, borehole with powered pump and storage (urban only) 	
<p>Household sanitation: Promotion of construction of at least basic toilets away from surface water. Community-based demand led programmes and/or sanitation marketing where possible. School sanitation: If school is near water resulting in OD/OU in/near water: Onsite sanitation toilet block (could add biogas digester if there is sufficient production or near farm to produce sufficient matter). Must be fully-lined so that it can be emptied and does not leach into water table</p>	
<p>Behaviour change</p> <p>Exposing:</p> <p>Recreation: as starting point, identification of a designated (relatively) safer swimming area within the same lake/river, or alternative area (where ecologically there are fewer snails). Small measures can be used to make the area preferable for children. Water recreation area (swimming pool) can be considered where there is a single site for recreational use; where there is no water scarcity; where a reliable water supply can be put in place; where a management structure is feasible/ affordable.</p> <p>Transmitting:</p> <p>Mobilisation and promotion activities to encourage uptake of toilets, bathing and laundry facilities. Activities may be linked with existing health outreach and school health education programmes, as well as delivered through mass communication and community mobilisation activities depending on context.</p>	

Further considerations and next steps

SCI Foundation has included a strong focus on environmental and behavioural measures for schistosomiasis (and other parasitic infections) control in its current strategy and plans.

Nonetheless, this is a new area of work for the organisation.

This approach will be utilised to inform support for Ministries of Health wishing to engage in water, sanitation and behaviour change activities for disease prevention, rather than for standalone projects. It will be continually reviewed and revised as needed to ensure its usefulness to national NTD control programmes.

Further work is needed to:

- Refine and agree the setting 'types' to ensure they reflect the programmatic reality
- Develop a comprehensive participatory and behavioural investigation approach
- Pilot the approach within one country, document the lessons and revise the approach as needed
- Identify the needed skills and resources within SCIF to deliver this work, and
- Communicate available support to national programmes.

SCI Foundation

Edinburgh House | 170 Kennington Lane | Lambeth | London | SE11 5DP | UK

T: +44 (0)20 8065 5630 | Charity number: 1182166 (England and Wales)

schisto.org      