# The effectiveness and sustainability of two demand-driven sanitation and hygiene approaches in Zimbabwe

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## ABSTRACT

Since 2000 a number of community-driven sanitation approaches have emerged that counter a historical trend to subsidise the provision of latrines to the poor. This study reports on a set of findings and conclusions concerning the effectiveness and sustainability of two such approaches operating in Zimbabwe, the community health club (CHC) approach and community-led total sanitation (CLTS). Surveys, interviews and focus groups were conducted in a total of ten project communities from three districts. Results show that, despite little resistance to the idea, a household's ability to own a latrine depends heavily on its ability to afford one. Affordability is also key in moving up the 'sanitation ladder', which is necessary if behaviour change is to be sustained in the long term. Whilst both approaches effectively encouraged measures that combat open defecation, only health clubs witnessed a significant increase in the adoption of hand washing. However, CLTS proved more effective in promoting latrine construction, suggesting that the emphasis the CHCs place on hygiene practices such as hand washing needs to be coupled with an even stronger focus on the issue of sanitation brought by CLTS.

**Key words** | behaviour change, effectiveness, hand washing, sanitation, sustainability

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## ABBREVIATIONS AND ORGANISATIONS

| | |
|---|---|
| **CHC** | community health club |
| **CLTS** | community led total sanitation |
| **Gov** | Government |
| **HWF** | hand washing facility |
| **IGA** | income generating activity |
| **OD** | open defecation |
| **ODF** | open defection free |
| **Oxfam** | UK based international NGO |
| **Plan International** | International NGO |
| **Zimbabwe AHEAD** | Zimbabwe based local NGO |

## INTRODUCTION

As it stands, the Millennium Development Goal of halving the number of people without access to basic sanitation by 2015 will be missed by approximately 1 billion people (WHO/UNICEF 2010). Confounding this issue, there is an increasing awareness that the traditional subsidy-driven response to poor levels of sanitation is often ineffective (WSP 2007). Simply supplying communities with improved infrastructure does not guarantee there will be the necessary desire to adopt it. For sanitation measures to be successful there must be the demand for them coupled with good hygiene practices (Curtis & Cairncross 2003; WHO 2010). It is only when these are in place that disease spread via faecal-oral routes may be combated or minimised, resulting in improved levels of health.

Since 2000 a number of initiatives that target the behaviour of people living in conditions of poor sanitation have been developed, and for the most part do not offer subsidies. Two of these approaches, community health clubs (CHCs) and community-led total sanitation (CLTS), are being implemented in Zimbabwe, a country with a long history of

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supply-driven sanitation (Rukuni 2010). In recent years the situation in Zimbabwe has moved from a relatively stable state to one beset by political unrest, violence, intimidation and a collapsed economy. The resulting hyper-inflation has meant that for most of the population the purchasing of goods has become a significant challenge, and this in turn has had serious consequences for any sanitation and hygiene programme that promotes self-supply of materials – most notably cement, which is a central component of permanent latrine structures.

In the past, standards of sanitation in Zimbabwe have been high, with the Government recognising as a minimum the ventilated improved pit (VIP) latrine. However, as the situation has deteriorated a lack of donor and government subsidies has meant these standards have slipped. In their place the idea of the 'sanitation ladder' has emerged, where particular sanitation measures are viewed as steps on a ladder whose end-goal is the uptake of permanent latrine structures, such as the VIP model. Whereas faecal burial and temporary latrines have originally been seen as unacceptable by government standards, they are now increasingly viewed as the first necessary steps a community practising open defecation (OD) must take en route to achieving appropriate levels of sanitation coverage.

Comparing the two approaches, arguably their most striking difference is the breadth of health issues tackled. CLTS is implemented by Plan International in Zimbabwe and is essentially a 'vertical' approach concerned solely with the achievement of open defecation-free (ODF) communities and the crucial practice of hand washing with soap. On the other hand, the CHC approach is 'horizontal', seeing the problem of disease as a social and structural issue, and, unlike CLTS's narrow focus, addresses a raft of 20 health issues, from HIV/AIDS and malaria to pit latrines, hand washing and refuse pits. The other difference of note is the way in which behaviour change is brought about. CLTS revolves around a single day of 'triggering' and a number of post-triggering follow up visits, where facilitators enter a community and, by using a selection of tried and tested techniques, elicit emotions such as shame, embarrassment and disgust from villagers as they realise that by practising OD they are in essence eating each other's faeces. This revelation is designed to bring about a transformation in the community who vow to come up with a plan to stop OD, which usually involves the construction of temporary toilets from locally available resources.

On the other hand, health clubs, which are run by the organisation ZimbabweAHEAD (applied health education and development) and are open for anyone to join, operate over a period of six months where club members gather weekly at a meeting point to discuss and debate a particular health topic. The session is led by a trained facilitator, sometimes from the community, who incorporates the use of pictorial cards displaying images of good and bad health practices into the discussion. Information and ideas are often expressed through song, dance, poetry and drama. The six months culminates in a 'model home competition' where the households that best display the health measures learned during the club meetings are voted for by other members, and a final graduation ceremony is held where those who attended all club sessions are recognised through the awarding of a certificate. It is not uncommon for the clubs to then move on to income-generating activities such as vegetable gardening, bee keeping and soap making.

At present there is much debate surrounding CHCs and CLTS, with many public health professionals generally leaning towards one or other of the two approaches as the best way of tackling Zimbabwe's sanitation situation. Despite this, to date a comparison of the two approaches has not been undertaken.

This study aims to analyse and compare the effectiveness and sustainability of CHCs and CLTS in Zimbabwe, and so act as the first step towards bridging this knowledge gap. To do this the following objectives are addressed:

1. A comparison between approaches of select indicators of sanitation and hygiene status.
2. An analysis of the motivation for change by project beneficiaries.
3. An analysis of factors influencing the effectiveness and sustainability of the approaches.

## METHOD

### Overall approach

The research set out to observe and compare *what* had changed with respect to sanitation and hygiene measures, *why* it had changed and to then *contextualise* these findings by identifying factors that had influenced the programmes.

Quantitative and qualitative techniques were used to do this, by conducting:

- a set of interviews with key informants relating to one or both of the two study interventions;
- fieldwork, where a number of surveys, interviews and focus groups were carried out with project beneficiaries.

A literature review identified key indicators for measuring sanitation and hygiene status (objective 1), guided both the structure and subject of the interviews (objective 2), and acted as a point of reference for the identification of influencing factors (objective 3).

For this study 'effectiveness' was taken to mean the extent to which acceptable sanitation and hand washing measures had been implemented, and 'sustainability' was taken to mean the continued existence, use, cleanliness and maintenance of sanitation and hand washing facilities over time (Carter & Rwamwanja 2006).

An inherent difficulty the research encountered was that in all cases the approach being studied was not the only programme to have operated in that area and results were obscured by the action of other interventions present at one time or another.

## Theoretical considerations

Neuman (1997) outlines the various 'dimensions of social research' which must be addressed if a study is to have a solid academic foundation. These dimensions – the purpose, use and time dimensions of the research and the data collection techniques employed – provide a 'roadmap' through the landscape of social research. Here the study is considered in the light of these dimensions.

### Purpose of research: Explorative, descriptive and explanatory

A comparison of CHCs and CLTS has not been conducted before, and the results provide the potential for further research. The study described and compared the sanitation and hygiene status of communities from both approaches, and then attempted to explain the reasons for these observations.

### Use of research: Partly basic, but predominantly applied

The research supported existing theories concerning behaviour change and factors that influence the relative success of sanitation and hygiene approaches, as well as proposing a number of its own. It also measured the potential health impact of the approaches by using proxy sanitation and hygiene indicators, and evaluated the results to give an indication of the relative effectiveness and sustainability of each.

### Time dimensions of research: Case Study

The study was a comparative case study of communities at two points in time, six months and two years after the inception of the CHC and CLTS programmes.

### Data collection techniques: Quantitative and qualitative

In conducting surveys, interviews and focus groups the research employed both quantitative and qualitative data collection techniques.

## Study populations

The communities included in this study consisted predominantly of Shona speaking people, a group that makes up 71% of Zimbabwe's 12.5 million population. However, one of the study sites was located in an area home to the Shangaan, a minority group who make up less than 10% of the population. Both groups place a strong emphasis on sociability and notions of friendship, common unity and respect, which plays an important role in the cultural dynamic. Respect is most acutely realised when looking at the relationship between parents and children, a husband and wife, and a family and their in-laws (e.g. Gelfand 1956)

Whilst CHCs apply an educational methodology where group consensus is sought through participation in health club sessions, CLTS is more confrontational, capitalising on the significance placed on respect and social relationships to elicit emotions such as shame and embarrassment, in turn galvanising a sense of community action and responsibility. These aspects of Shona and Shangaan culture appear to provide a point of focus for the differing mechanisms of the two approaches, where

peer pressure – positive in the case of CHCs and negative in the case of CLTS – is used to drive behaviour change.

Zimbabwe has traditionally had high levels of education; in 2008 the total adult literacy rate was estimated at 91% (UNICEF 2010). This has implications for the impact of the two approaches, suggesting that Zimbabweans may be more inclined to favour the knowledge-based approach of the health clubs over the 'shaming' techniques employed by CLTS.

## Study sites

The study was carried out in three districts of Zimbabwe: Chiredzi district, Chipinge district and Mutoko district (Figure 1; Table 1).

## Key informant interviews

Three groups of key informants were interviewed, as outlined in Table 2 (see Appendix Table A1 for complete listing of interview and focus group participants, available online at http://www.iwaponline.com/washdev/001/015.pdf). The interviews were semi-structured (Rubin & Rubin 1995), with questions relating to the effectiveness and sustainability of the two approaches. Interviewees were purposively selected for (Robson 2002) during the data collection stage. The majority of interviews were conducted in English, with the exception of three CHC facilitators and two Plan community health workers, where a Shona-speaking translator was used.

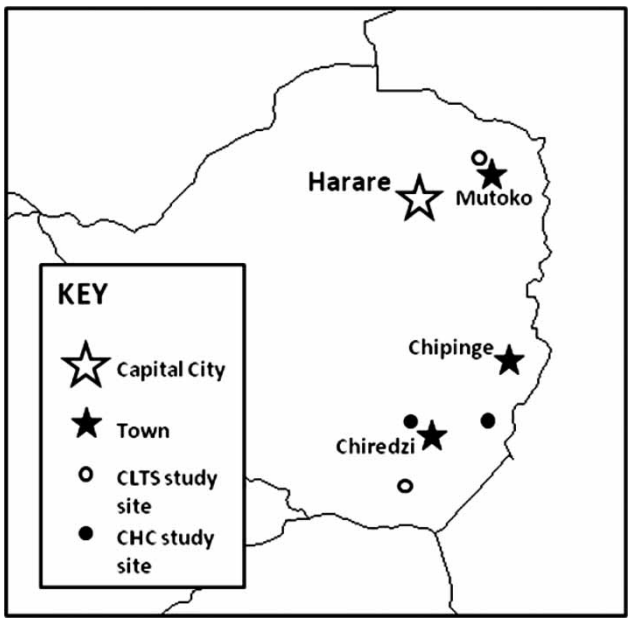


**Figure 1** | Map of Zimbabwe showing the locations of the study sites.

**Table 1** | Description of the sites included in the study

| District | Intervention | Area | Description |
|---|---|---|---|
| Chiredzi | CHCs since late 2009 | Ward 29 – Buffalo Range | Dry, with bush, scrub and trees providing cover. Was wildlife conservancy up until 2000, then allocated as resettlement land by gov. Few previous health interventions. Badly affected by cholera outbreak in 2008. Shona speaking |
| | CLTS since late 2009 | Ward 7 – Chilonga area | Dry, with bare ground providing little cover. Well-established communities. Affected by cholera outbreak in 2008. Shangaan and Shona speaking |
| Chipinge | CHCs since 2008 | Ward 27 – Save River area | Dry, with bare ground proving little cover. Well-established communities. Area did not feel effects of 2008 cholera outbreak to the extent of some other parts of the country. Shona speaking |
| Mutoko | CLTS since 2008 | Ward 10 – Mutoko area | Relatively dry, with some cover. Well-established communities. Affected by cholera outbreak. Shona speaking |

## Fieldwork

### Sampling

Data were collected over a period of seven weeks during 2010. Where there was a choice of locations the study

**Table 2** | Description of key informants interviewed

| Key informant category | Number interviewed | Description |
|---|---|---|
| CHC approach | 6 | Executive director of ZimAHEAD; a programme unit manager; 4 community-based facilitators |
| CLTS | 3 | Plan countrywide CLTS officer; 2 plan community health workers |
| CHC and CLTS | 3 | Deputy head of dept for environmental health in Chiredzi; CHC programme unit manager previously practising CLTS; public health worker operating in community where both approaches were implemented |
| Total | 12 interviews | |

ward and communities were selected at random from a hat (O'Leary 2005), as was the case with CHCs in Chiredzi and Chipinge districts and with CLTS in Mutoko district. Where there was no choice of locations the ward and communities where the intervention was being practised was purposively selected, as was the case with CLTS in Chiredzi district where the intervention was only in the pilot study phase.

## Data collection

Data were collected by one team of two people during unannounced visits to the communities. The team consisted of a researcher and a translator. A breakdown of the total quantitative and qualitative data collected during the fieldwork phase can be seen in Table 3. Initially, a feasibility study (Robson 2002) involving a short survey, semi-structured interviews and focus groups was carried out in ward 17 of Chiredzi district (which was outside the study area) from which questions and approaches were refined. It became apparent that focus groups were not appropriate when looking at the CHC approach, because participants tended not to criticise the approach when in the company of other club members. This was not the case in CLTS intervention areas, where participants did not appear to have these inhibitions and focus groups therefore proved appropriate.

## The survey

The survey was designed to gather information from project beneficiaries relating to demographic, socio-economic, sanitation and hygiene status. Sanitation was measured by observing whether a respondent's family practised OD or 'cat sanitation' (faecal burial), or whether they owned a temporary or permanent latrine, and where a latrine was present whether it was used, cleaned, covered and maintained. Hygiene status was measured by observing the presence and use of a hand washing facility (HWF), and whether soap or ash was present. These proxy indicators were adapted from Waterkeyn & Cairncross (2005) and Billig *et al.* (2009), and serve as widely accepted measures of disease reduction because they show that well-known barriers to diarrhoea are in place and provide good evidence that behaviour change has occurred (Feachem 1984).

The average community visited was relatively small (20–80 households). Where the community was larger and more dense, a random transect walk was conducted with every second house sampled (Robson 2002). However, surveys usually entailed sampling every household along the way. This was due to a number of practical reasons:

- sparse settlement of many project areas, with some households located on 25 hectare sites;

**Table 3** | Quantitative and qualitative data collected during the fieldwork phase of the study

| District | Intervention | Number of communities in study | Number of interviews | Number of focus groups | Number of households surveyed |
|---|---|---|---|---|---|
| Cr | CHC | 2 | 7 | 0 | 50 |
| | CLTS | 2 | 0 | 3 | 48 |
| | CHC & CLTS | 2 | 0 | 2 | 30 |
| Cp | CHC | 2 | 0 | 0 | 50 |
| Mt | CLTS | 2 | 0 | 0 | 55 |
| Total | | 10 communities | 7 interviews | 5 focus groups | 233 households |

- households sometimes separated by dense vegetation;
- the community was too small to warrant visiting every other household.

Purposive sampling was conducted in CHC intervention areas of Chipinge district as club members were less abundant here, and these households were the main target of the survey.

### Interviews and focus groups

Semi-structured interviews and small focus groups (Rubin & Rubin 1995) involving two to three participants were conducted with project beneficiaries in order to understand the motivation for behaviour change observed with respect to sanitation and hygiene practices, and factors that influenced the relative effectiveness and sustainability of the interventions. During the survey in Chiredzi district participants were asked if they would be happy for the researcher to return for a more in-depth interview concerning health, sanitation and hygiene. Having gathered data relating to respondents' family size, socio-economic status, and sanitation and hygiene measures, a number of people from each community who had agreed to further questions were purposively selected. Based on the data from the survey the interviews and focus groups attempted to vary the 'type' of participants included so as to incorporate a range of perspectives.

## Data analysis

Of the total number of 233 households surveyed in ten communities, 128 were from Chiredzi district and related to the effectiveness of the approaches six months after inception. The remaining 105 were from Chipinge and Mutoko districts and related to the sustainability of the approaches two years after their inception. Survey data was analysed to compare the status of sanitation and hygiene indicators between the approaches with respect to effectiveness and sustainability, and to compare each approach in the effectiveness study with its counterpart in the sustainability study.

Further analysis was conducted to compare the individual CHC and CLTS samples in Chiredzi district with data collected in two communities where both interventions had been implemented. All results were tabulated. Indicators being compared were placed in frequency distribution tables and the statistical significance of any difference observed was found by performing a chi-squared test (Neuman 1997). The relative proportions of responses were also worked out as percentage values.

Interviews were recorded digitally and transcribed. Transcripts were read and re-read, and responses coded to create a set of concepts and themes. Further analysis was performed on this secondary data set resulting in the emergence of overarching themes (Rubin & Rubin 1995). Whole interviews were again read to re-contextualise the results of the coding process.

## Reliability and validity

This study attempted to triangulate data collection methods (Robson 2002), using surveys, interviews and focus groups, and the analysis of clinical data to measure the impact the approaches had on the health of the study populations. However, the clinical data proved inaccurate and was not included. The survey, interviews and focus groups were piloted (Robson 2002) in a ward outside the study area, and adapted accordingly.

All interviews and focus groups were conducted using the same translator, with whom the researcher had a good working relationship. Semi-structured questions were asked and the responses coded to ensure greater validity (Neuman 1997). A literature review provided the context for the data to be interpreted and helped to guide, but not stifle the analysis.

Five surveys were conducted, with two communities included in each so as to give a more representative sample. Reliability was improved by using more than one indicator for some measurements, and a number of criteria per indicator for other measurements. A purely anecdotal claim to hand washing using the 'common bowl' method was not considered sufficient because alluding to a dish for hand washing is not clear evidence of behaviour change; it is not obvious that such a method would always be used after defection; and the level of hygiene achieved is debatable considering the dish must usually be handled. As a consequence, only the 'pour to waste' and permanent tap structures were included as evidence of behaviour change with respect to hand washing.

In the case of a claim that a respondent's household practised cat sanitation, a search for OD in the nearby vicinity was conducted. The indicators used in the survey were associated with pre-existing indicators known to be valid, and that sufficiently measured the definitions included in the study (Neuman 1997), namely the effectiveness and sustainability of sanitation and hygiene measures.

### Weaknesses and sources of bias

The study did not incorporate either baseline data from the intervention communities or a control group, both of which would have assisted in understanding the significance of the results (Neuman 1997). Whilst OD was looked for in the immediate vicinity, it is unlikely that this served as good evidence that cat sanitation was not being practised, though limited resources made a more thorough search impractical in the context of this study.

Furthermore, although most of Loevinsohn's (1990) 11 criteria for rigorous study were addressed, there were a number of exceptions and consequently further research is required in order to take account of these criteria. Most notably, 'education levels' were not included as part of the survey, although as noted previously Zimbabwe is a country with a high literacy rate. Finally, the results of this study suggested there is a relationship between socio-economic status and the likelihood of owning and maintaining a latrine. Although it was not possible to control the variable of 'socio-economic status' in this study, further research is needed to verify this.

## RESULTS AND DISCUSSION

It is important to highlight that, although this study has compared the CHC approach and CLTS by focusing on the issues of sanitation and hand washing, the two interventions differ considerably with respect to the scope of their intended impact. CHCs cover a broad range of health-related issues through a structured, regular system of club meetings and practical activities. In contrast CLTS is an approach with a single message conveyed during a relatively small amount of contact time with the community. Nonetheless, what both approaches do share is the underlying mechanism for action: the creation of a demand for behaviour change from within the community.

### Survey results: Demographic and socio-economic indicators

Select demographic and socio-economic indicators were measured in the effectiveness and sustainability studies. In the effectiveness study the community where both interventions were practised has here been termed 'BOTH' (see Appendix Table B1 for results, available online at http://www.iwaponline.com/washdev/001/015.pdf).

### Effectiveness

The results showed that a high proportion of respondents attended CHCs (72% CHC versus 77% BOTH), and of these most graduated. Similarly, at least three-quarters of the people surveyed had attended the CLTS triggering day (when the community is moved into action through coming to terms with the implications of OD; see Introduction for more detail on this) (75% CLTS versus 83% BOTH).

The socio-economic status of participants follows a relatively normal distribution for CLTS and BOTH, although this is not the case in the CHC sample where 66% of respondents were classed as 'less well off'. Family size followed a normal distribution for CHCs and CLTS; however, the BOTH sample revealed a high proportion of large families (47%). Over 80% of all respondents said farming was their main source of income.

### Sustainability

Again, a high proportion of people had attended the CHCs (86%) and graduated (98%), or had attended the CLTS triggering day (89%). The socio-economic status of both samples showed a relatively normal distribution. In terms of family size, although CLTS showed a normal distribution, the CHC sample revealed a high proportion of large family sizes (42%). The vast majority of respondents reported farming to be their main source of income.

The study looked at the relationship between socio-economic status and the likelihood of owning a latrine, and

size of family and the likelihood of owning a latrine. It found that being a poor member of the community significantly (all significance levels are $p < 0.05$ unless stated otherwise) reduced the likelihood of owning a latrine ($p < 0.001$), whilst being well off significantly increased it ($p < 0.01$). Size of family had no bearing on whether recipients were more or less likely to own a latrine (see Appendix Table B2 at http://www.iwaponline.com/washdev/001/015.pdf).

## WHAT CHANGED AND WHY?

### Comparing effectiveness: Survey results

CHCs were significantly more effective than CLTS in two key respects. Firstly, more people disposed of their faeces by some method other than OD (92% versus 77%), and secondly, the number of people who owned a HWF was far greater in the case of CHCs (64% versus 10%, $p < 0.0001$). In terms of sanitation, only 26% of CHC respondents owned a latrine, although all of them had been built since the intervention started. A large number therefore (66%) claimed to practise cat sanitation; 44% of CLTS respondents owned a latrine, and it is interesting to note that 57% also shared their latrine with others, as opposed to 0% in the case of CHCs. The number of latrines with a cover on was found to be low in the case of both approaches (31% CHC versus 48% CLTS). The results are portrayed in Figure 2 (see also Appendix Table B3 at http://www.iwaponline.com/washdev/001/015.pdf).

### Influencing factors: Challenges to effectiveness

During interviews and focus groups with key informants and project beneficiaries a number of factors that influence the success of the interventions were identified. Most of these are common to both approaches as detailed in Table 4.

### Motivation for change

A key focus of this study was to understand the motivation behind any perceived behaviour change, and in so doing address not only *what* has changed, but also *why* it has changed. In the case of the CHCs a number of factors became apparent from responses given during interviews and focus groups.

#### To prevent disease, with an emphasis on cholera

An often-cited reason for improved sanitation and hygiene practices was to reduce the possibility of contracting and spreading disease. The disease most commonly mentioned by respondents was cholera: 'The main reason [for building a latrine] is that open defecation causes diseases, we have

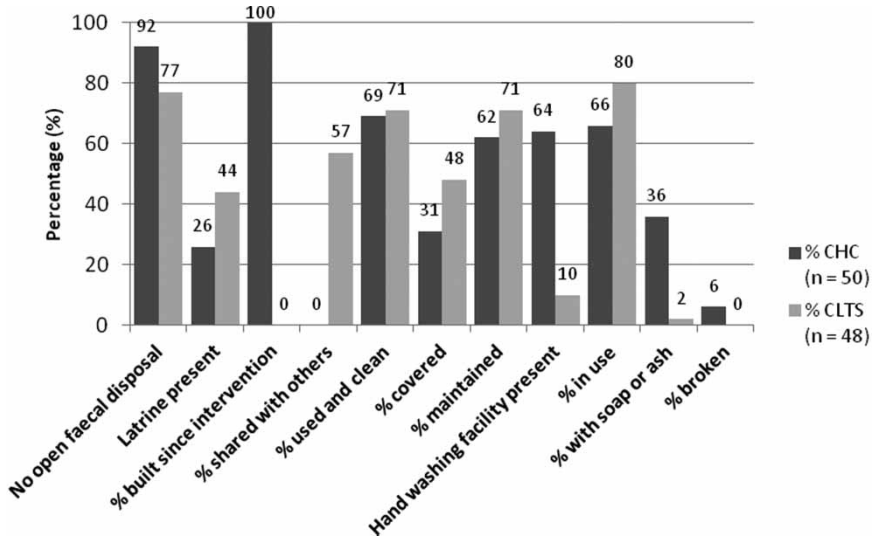


**Figure 2** | Effectiveness of the CHC and CLTS approaches according to select sanitation and hygiene indicators.

**Table 4** | Factors identified as influencing the effectiveness of the approaches

| Approach | Factor | Comments |
|---|---|---|
| CHC and CLTS | Seasonality | Many respondents' livelihoods depended on working in fields during rainy season, when the approaches were conducted |
| | Location | The amount of cover the area provides; whether ground suitable for digging a pit; available resources; likelihood of outsiders passing through |
| | Health of community | Extent to which a community has been exposed to disease, especially the recent outbreaks of cholera |
| | Participation of village head | Success of project dependent on acceptance and participation of village head in programme |
| | Donors and large NGOs | Policy-level decisions and resulting action of NGOs on the ground affects the degree to which an approach succeeds |
| | Migration | Members of many families had left Zimbabwe to seek employment over the border in South Africa. Many of these were males |
| CHC | Competitions | Whether 'model home competitions' increase or decrease enthusiasm for health practices |
| | Mobility of the facilitator | Number of clubs a facilitator oversaw, and the distance they needed to travel to get to them. A bicycle was a much prized possession |
| CLTS | Post-triggering follow up | Whether organisation returns to community for support visits. This was seen as very important |

got flies that will visit the areas where we have visited and they will come to our food' (006:085 – CHC member).

### Competition with club members

The CHC approach appears to generate a natural sense of competition between members, where 'you get this sort of peer reinforcement, which spirals up so that cat sanitation becomes the minimum, but actually when they compete with each other they try to do better and better and better' (001:199 – ZimbabweAHEAD Executive Director).

### A sense of achievement

The health clubs satisfied a desire for knowledge and learning in a population often consisting of a large number of illiterate people without any formal achievements to their name. The graduation ceremony at the end of the 20 sessions, which awarded a certificate to those members who had attended all sessions, underlined this:

> 'And the thing of graduating, it has a very big impact … because you know that tender age, at old age, that women will say at least I have a certificate. She will say let me learn, and she will learn until the end, improving (017:225 – Dept for Environmental Health worker).'

### A sense of belonging

With the health clubs, members entered into a dynamic which formed and strengthened social bonds. People became more likely to help each other, with respect to both club issues and issues to do with the wider community dynamic:

> 'But when they come together they find there is more that binds them together than keeps them apart, and that realisation will make life easier for somebody in his home area because people will then find out that there's more to gain by staying closer to each other, by realising you are united (020:162 – Community health worker).'

### A promise of future income-generating activities (IGAs)

It is common after the initial 20 health club sessions for club members to then enter into joint IGAs, such as nutrition gardens and bee keeping. This was mentioned to members before the clubs started and acted as an impetus to join: 'The main interesting issue that motivated people to come to the health clubs was the fact that there was a point when it was said that there would be a time when income generating projects would be introduced' (020:188 – Community health worker).

In the case of CLTS two motivating factors were of prime importance:

### Shame, disgust and embarrassment

The emotions aroused in community members during the triggering day act as the main stimulus for behaviour change. One key informant demonstrated how effective this tool can be when they relayed the story of three communities who had constructed temporary toilets because they heard reports of the triggering process in the village near them and did not want to have to suffer the same embarrassment. Here being 'as culturally insensitive as possible' (024:057), with an emphasis on direct, crude language was said to be necessary for achieving good results: 'We felt embarrassed. And all the people who were there said that we must build the toilet so we don't eat each other's faeces' (015:076 – CLTS respondent).

### Cholera

As with the CHCs, cholera was an important factor in raising awareness and promoting behaviour change. However, the prevention of diseases other than cholera was seldom referred to by CLTS respondents: 'At that time there was nothing so much, but we were hearing that cholera had an outbreak there, and an outbreak there, so we expected at any time that cholera might be in our society' (013:131 – CLTS respondent).

## Sustaining change

One report on a CLTS programme in Ethiopia notes: 'Training and triggering CLTS in a village is the easy part. Sustaining the process and the momentum is what is difficult' (Tsegaye *et al.* 2009). Adding a time dimension to the success of a programme brings with it a number of key challenges which need to be addressed.

### Comparing sustainability between approaches: Survey results

Again the presence of a HWF differed significantly between the two interventions (37% CHC versus 2% CLTS, $p < 0.0001$). In this case the vast majority of respondents from both approaches owned a latrine (98% CHC versus 95% CLTS), with 28% CHC and 13% CLTS claiming to share their latrine with other households. Significantly more CLTS respondents had built a latrine since the approach began (74% versus 52%). Again the number of latrines with a cover on was low (30% CHC versus 18% CLTS). The results are portrayed in Figure 3 (see Appendix Table B4 at http://www.iwaponline.com/washdev/001/015.pdf).

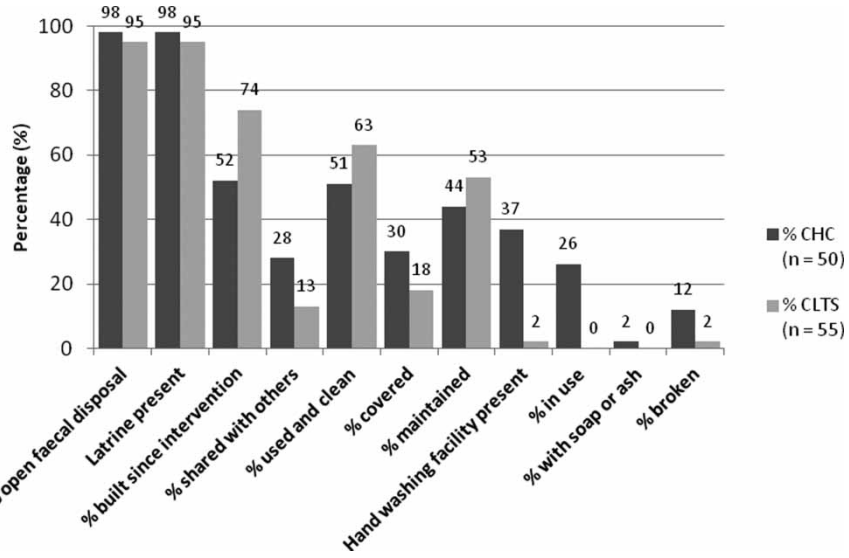


**Figure 3** | Sustainability of the CHC and CLTS approaches according to select sanitation and hygiene indicators.

### Comparing effectiveness and sustainability within approaches: Survey results

*CHCs.* Looking at the CHC approach, significantly more latrines were present in the sustainability study compared with the effectiveness study (98% versus 26%, $p < 0.0001$). Unlike for the effectiveness study where all latrines were constructed since the intervention began, for the sustainability study this proportion was just over half (52%). Significantly more people shared a latrine with other households in the sustainability study (28% versus 0%). There was no significant difference in the proportion of latrines that were maintained (62% 'effectiveness' versus 44% 'sustainability'). The results are portrayed in Figure 4 (see Appendix Table B5 at http://www.iwaponline.com/washdev/001/015.pdf).

*CLTS.* Looking at CLTS, significantly more people disposed of their faeces by some method other than OD in the sustainability study (95% versus 77%). Here, significantly more people also owned a latrine (95% 'sustainability' versus 44% 'effectiveness', $p < 0.0001$) and had constructed it since the intervention began (74% 'sustainability' versus 0% 'effectiveness'). However, significantly more people shared a latrine in the effectiveness study (57% versus 13%, $p < 0.0001$), and had a cover on their latrine (48% versus 18%), although both proportions were still low. There was no significant difference in the proportion of latrines maintained between the two studies (71% 'effectiveness' versus 53% 'sustainability'), and the presence of HWFs in both was almost negligible (10% 'effectiveness' versus 2% 'sustainability'). The results are portrayed in Figure 5 (see Appendix Table B6 at http://www.iwaponline.com/washdev/001/015.pdf).

### Influencing factors: Challenges to sustainability

As with the effectiveness study, a number of factors were identified that influence sustainability, all of which are common to both approaches (see Table 5).

## Putting the findings in context

### Sanitation measures

A comparison of the relative effectiveness of the two approaches was inhibited by the fact that **no post-triggering visits** were conducted in the CLTS communities of Chiredzi district. This is something CLTS practitioners stress as important (Kar & Chambers 2008), with claims from interviewees also emphasising the difference return visits might have made to the lack of change observed: 'I personally think if those Plan [International] guys had come back and motivated people and encouraged them, then we would have done it because we had already forgotten about it,

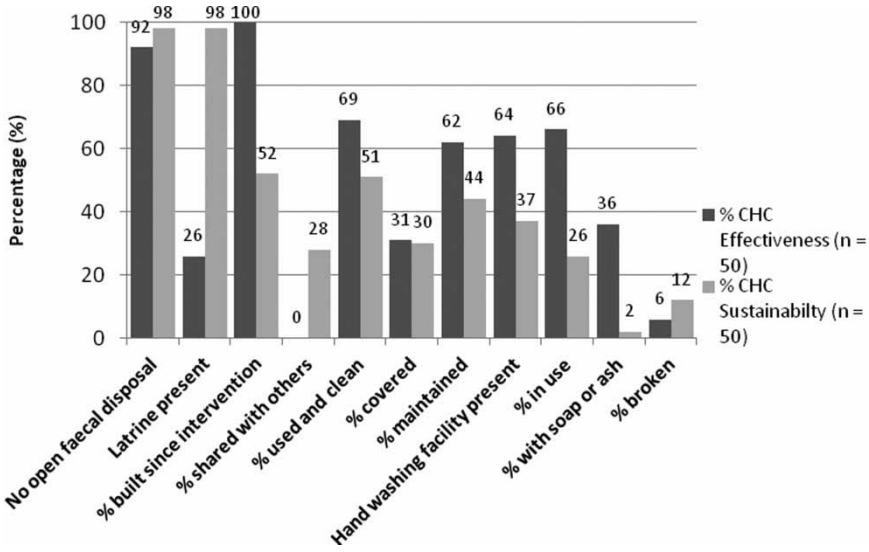


**Figure 4** | Comparing CHC select indicators for sanitation and hygiene status between the effectiveness and sustainability studies.

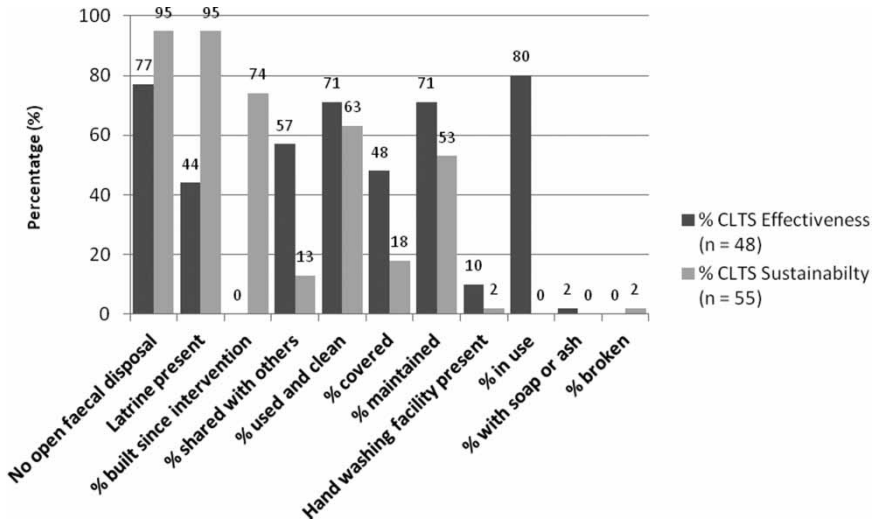


**Figure 5** | Comparing CLTS select indicators for sanitation and hygiene status between the effectiveness and sustainability studies.

**Table 5** | Factors identified as influencing the sustainability of the approaches

| Approach | Factor | Comments |
|---|---|---|
| CHC and CLTS | Periodic follow-up visits over time | Regardless of the approach, most stressed need for periodic visits from outsiders to ensure people keep up good practices |
| | Donor and gov. policy | The length of time projects receive funding for, and institutional standards that inhibit the approach |
| | Destruction of temporary latrines and HWFs | Temporary structures deteriorate over time, and rebuilding them proved an unpopular option with respondents |
| | Affordability | Access to funds for materials, especially cement, and skilled labour necessary for a permanent latrine was beyond most people's means |

because they talked about it and then we forgot' (014:141 – CLTS respondent).

When also considering the sustainability study, survey results showed that if conducted properly both approaches do in fact effectively encourage measures to counter the practice of OD, although these measures fell short of being entirely successful as in all cases the **proportion of latrines with a cover on was low**. Furthermore, in many cases the covers that were present on a latrine did not stop flies entering the hole. The central goal of ZOD (zero open defecation) in the case of CHCs, or ODF status (open defecation-free status) in the case of CLTS was therefore undermined because 'if you have a toilet that is open, where there's a hole and the flies can go in and out, then that's also open defecation because you're not breaking the faecal oral route' (001:338 – ZimAHEAD Exec Director).

Surveys revealed that neither approach showed a significant difference in the proportion of latrines maintained between the effectiveness and sustainability studies, although a notable difference was still apparent, with CHC figures changing from 62% to 44% latrines maintained, and CLTS figures from 71% to 53% latrines maintained. The figure of 62% in the CHC effectiveness study is particularly low to begin with, and is due predominantly to two influencing factors outlined in a following section, namely Oxfam toilets and the 'model home competitions'.

Nonetheless, 52% of CHC latrines and 74% of CLTS latrines in the sustainability study were constructed after the intervention began, and in both cases around half were in a poor condition, showing that with these approaches the issue of **maintaining temporary latrines is problematic**. The degree of damage to latrines was usually greater in the sustainability study, although the survey was not sensitive

to this fact. The cause of damage was given as the action of termites, wind and cattle.

It is questionable whether all respondents who claimed their households practised cat sanitation did in reality do so. This was because a hoe is needed to dig the hole, which was viewed as a chore, especially when you also have a number of children who you must monitor and accompany every time they need to defecate: 'it is very painful, you cannot take a hoe every time you feel like going to the toilet' (015:085 – CLTS respondent). It was also considered embarrassing by some because anyone who sees you carrying a hoe will know you are going to relieve yourself. This type of response was more common with CLTS interviewees.

### Hand washing

Many studies highlight the impact hand washing has on disease spread (Curtis & Cairncross 2003). Importantly, **only CHCs combined an improvement in sanitation practices with a measurable increase in the presence and use of hand washing facilities**. This was apparent in CHC interviews where respondents often placed a high degree of significance on hand washing: 'when you come from farming you have to wash your hands, when you go to the toilet you have to wash your hands, wherever you come from you have to wash your hands' (003:071 – CHC respondent).

With CLTS hand washing did not receive the same amount of attention and although it appears to be addressed on the day of 'triggering' the message is not made clear enough, to the point that a number of people could not recall hand washing being mentioned at all. Even with CHCs though, the proportion of people who **used soap when washing their hands was low** (36% effectiveness study and 2% sustainability study), a problem considering that the use of soap is significantly more effective in reducing faecal bacteria (Kaltenthaler *et al*. 1991).

Looking at CHCs, the proportion of HWFs present differed significantly from 64% in the effectiveness study to 37% in the sustainability study, and the proportion of HWFs in use from 66% to 26%, respectively. In the sustainability study, some households where no HWF was present may have once had a temporary structure but it had since broken and been discarded. A common issue raised by interviewees was that children tended to tamper with the temporary structures, emptying or even breaking them. Nonetheless, the results point to a **problem with the sustainability of temporary HWFs** and, considering the relative ease with which they are constructed, a problem with the desire to maintain them.

### Motivation for change

It is now widely recognised that knowledge alone of what causes disease and how to prevent it is often not enough for real behaviour change to occur (Wijk & Murre 1995). Interviews with project beneficiaries confirmed this, as a number of other motivational factors driving the two approaches became apparent. The study shows that the CHC approach offers a greater number of these, with five key motivational factors as opposed to two in the case of CLTS, as detailed previously.

### Key influencing factors for effectiveness

Of consequence was the range of locations in the study, and the influence different contextual factors had on the outcome of the programmes. Most significant was a **household's ability to afford a latrine** (which links into sustainability and is covered in more detail in the following section) and the **extent to which a community's surroundings provided cover**, with a number of respondents attributing the construction of latrines to the problem of finding shelter when defecating: 'The main reason [for having a latrine] is because this area is a very open space so people have to find a way to hide from being seen' (021:063 – CHC facilitator).

The survey results also indicated this, with a high proportion of latrines present in all communities where there was little cover, and where many of these latrines were built before the intervention. In the CHC effectiveness study where the landscape consisted of bushes and scrub, latrine construction was at only 26%. However, in this same area a number of communities had received both interventions and here latrine construction was high (93%), as too was the CLTS sustainability study (95%) in Mutoko district where the area also provided a degree of cover. In both cases the majority of toilets observed had been constructed since the inception of the interventions (86% BOTH and

74% CLTS), implying that **CLTS effectively promotes latrine construction**.

A crucial factor was **seasonality**, and the time available to the recipients of the projects. In all surveys over 80% of respondents claimed subsistence farming to be their main source of income, and consequently their ability to attend health club sessions or to construct latrines suffered if they had commitments in the field, as one respondent said:

> 'People were keen to make a change, but after that program people did not do much of their expected impact that they had resolved to do because of fear of commitments. That was a time when we started to go to the field (012:080).'

Time pressures were made greater for a large number of families because of the political climate in Zimbabwe which had forced many people, especially male family members, to migrate to South Africa for employment. This affected a family's ability to build a structure such as a pit latrine, where manual work was required, and also meant female family members usually had more to attend to, and consequently had less time for the adoption of sanitation and hygiene measures, an issue previously highlighted by Leslie (1989).

The **policy of donors and action of large NGOs** was criticised by a number of key informants who questioned the length of time projects receive funding for and the subsequent sustainability issues: 'Because you can see partners come and do a project just for something like three months, then they go leaving the people on their own' (017:324 – Dept Environmental Health worker). Furthermore, the actions of Oxfam, ZimbabweAHEAD's partner organisation in Chiredzi district, appeared to go against the objectives of the CHCs when they installed 45 Blaire VIP pit latrines in a community where health cubs were operating, leaving those who didn't receive a latrine feeling frustrated and unclear as to why: 'we don't even know how it was decided, whether it was decided by Oxfam officials, we don't even know why some people got them and others didn't' (008:131 – CHC member).

Survey results showed that households who did not receive an Oxfam latrine displayed poor sanitation and hygiene practices (17% owned a latrine of which 0% were maintained; 52% owned a HFW of which 33% were in use), with feedback from interviews indicating that having not received a latrine people tended to lose interest in the overall programme. These poor results appeared also to be the effect of the 'model home competition' run by the health clubs. People often agreed with the idea of a model home competition in theory, as it provided the opportunity for club members to compare themselves with and learn from the 'best households' in their community. In reality though, many felt hard done by when they didn't do well or win a prize, causing some to 'drag their feet on the issue of club work' (010:128).

### Key influencing factors for sustainability

Interviews consistently hit on two key issues concerning sustainability. The first was an **inability to move up the sanitation ladder**. In the vast majority of cases this referred to the cost of cement, which was beyond what most rural Zimbabweans could afford and greatly diminished the possibility of constructing a permanent latrine. A number of interviewees referred to their dislike of temporary latrines because they break and fill up quickly. There was a general desire to own a permanent structure, and it was clear that when a temporary latrine becomes unusable there is not always the will to construct a new one. A number of people surveyed had reverted to cat sanitation or even open defecation.

This suggests that for an approach that may at first encourage simple measures such as cat sanitation or temporary latrines, the capacity of a community to move up the sanitation ladder is vital if sustainability is to be achieved, as one respondent put it:

> 'If you say dig the holes they will dig the holes, they will mould the bricks, they will build their own toilets. But the challenge is cement. So I think you can support them with cement so that we reach the ZOD that we want. There is no way we can achieve 100% ZOD if we don't have permanent structures (023:245 – CHC programme unit manager).'

The second key issue is that it does not matter what type of programme is conducted in an area, unless **follow-up visits**

are performed periodically, where outsiders come into the village and 'check up' on people's sanitation and hygiene practices, these practices will tend to dissipate with time. Visits of this nature, even if made only to bring attention back to the programme, reinforce the message that it is ongoing and is not to be forgotten.

As a health club facilitator put it after the survey had been conducted in her community:

> 'Now that you have moved around in the areas, that will even reawaken those people who are there and they know that the programme is being followed up, and this will bring a lot of changes to the way the sanitation measures are being taken in this area (022:074).'

Whilst it is satisfying to think an approach has the relative merits to promote behaviour change that will continue unaided, the results of this study do not suggest this is possible in the short to medium term.

### Working together

In Chiredzi district data was collected from two communities where both CHCs and CLTS had been implemented (termed 'BOTH'). These communities are located in the same region of the district as the communities in the CHC study, where the vegetation provided good cover and as such 'exposure' was unlikely to be a reason for constructing a latrine: 'Back home we had toilets because we didn't want to be seen, but here there are a lot of bushes' (005:083 – CHC respondent). The BOTH survey results were similar to those of the CHC survey (see Appendix Tables B7 and B8 for results, available online at http://www.iwaponline.com/washdev/001/015.pdf) with the exception of 'the presence of a latrine' which differed significantly (26% CHC versus 93% 'BOTH', $p < 0.0001$). This suggests there is scope for the two approaches to complement one another.

However, the relationship between socio-economic status and the presence of a latrine, where being less well off indicates you are significantly less likely to own a latrine ($p < 0.001$) must also be taken into account. The CHC effectiveness study showed a high proportion of people classed as less well off (66%) and this may explain the lack of latrine construction observed. Furthermore, it is not clear whether the way in which the two approaches bring about behaviour change will prove compatible; CHCs employ motivational factors such as a sense of achievement and a sense of belonging whilst CLTS elicits powerful emotions such as disgust, shame and embarrassment. Responses from interviews with key informants in a position to judge both approaches tended to favour the health clubs over CLTS, usually on the grounds that CLTS brought shame upon a community, and that the broad approach, greater detail and regular structure of the health clubs was a preferred method.

> 'The CLTS program of course is good, but the clubs were a bit better because they brought more of a one-on-one coaching and more advanced issues like the club cards, because they were used as toolkits to demonstrate (020:095 – Community health worker).'

> 'It's [the CHC method] not shameful, that person knows for himself that he should have a toilet. And people are taught the route of transmission for all the diseases. So people become aware of water and sanitation, and everything. So me, I support the health clubs, the community health clubs. CLTS it puts the community to shame (017:205 – Dept for Environmental Health worker).'

## CONCLUSIONS

As might be expected from a country which in the past has displayed high levels of sanitation, the results of this study suggest that people in Zimbabwe are not resistant to owning a latrine, nor are they unaware of many of the reasons for doing so, especially in the light of recent cholera outbreaks. Nonetheless, motivating latrine construction and use, and coupling this with the practice of hand washing with soap remains a key challenge.

This task becomes more difficult when taking into account that the strong subsidy-driven approach to sanitation taken by the government has faded in recent years, leaving a residual expectation amongst much of the population that the issue of sanitation is one for government or aid workers to address (Rukini 2010). Furthermore, the very low purchasing power of the average Zimbabwean makes the acquisition of materials necessary for latrine construction extremely difficult and

serves as a real challenge to any sanitation and hygiene approach that promotes self-supply.

In this study a mixture of quantitative and qualitative techniques were employed to assess and compare the effectiveness and sustainability of CHCs and CLTS. More generally, it was found that:

- Donor policy is instrumental in determining the degree to which a programme is successful in both the short and long term. Decision making that fails to achieve sustainability because of short-term funding and target-driven approaches that focus solely on latrine construction must be reappraised.
- Researchers need to be aware of the influence of contextual factors on the outcome of results, as failure to identify them may lead to spurious claims being made about the intervention in question.

Rather than being approach-specific, the socio-economic status or relative wealth of a household was found to most significantly affect the likelihood of an intervention promoting latrine construction. As a result, in a weak economic climate the efficacy of any self-supply programme may often depend upon it being introduced alongside IGAs. Such activities already make up a second phase in selected CHC programmes, but must become standard practice in rural communities such as those found in Zimbabwe where income levels make it implausible for most households to purchase the materials necessary for constructing more permanent latrine structures.

The issue of affordability also poses a challenge to the sustainability of a project, as in time temporary structures tend to break or fill up and there was seen to be a general unwillingness amongst beneficiaries to replace these structures. Instead, people sought to construct more costly permanent structures, reinforcing the need for available capital if a community is to move up the sanitation ladder. Not only does this again point to the importance of introducing IGAs but also suggests that in some contexts it may be appropriate to provide subsidies for latrine construction once a real desire for change has been achieved.

This study also found location to be significant, showing that where an area's surroundings provide little cover, latrine construction tends to be high. It is then the place of qualitative research to determine to what extent the action of a particular intervention influences construction. Location also encompasses a community's proximity to a town or city, from where it is easier to access materials associated with latrine construction. Being close to these areas also increases the likelihood of outsiders using community land to defecate, dump litter and perform other unsanitary practices.

Comparing CLTS with CHCs, it is clear that both approaches effectively tackle the practice of open defecation (OD) with the data showing that on average 95% of CHC participants and 86% of CLTS participants did not practice OD. Nonetheless, results point to a number of concluding statements in favour of CHCs:

- Education in itself may not be enough to bring about behaviour change. However, where CHCs are grounded in techniques that promote educational values and learning, they were also seen to provide five further motivating factors for change as opposed to only two in the case of CLTS (which exhibited little in the way of health education).
- Affecting and sustaining change depends in part on the number of face-to-face interactions an approach provides. Whilst on average CLTS offers three of these interactions (H. Chimhowa, PLAN Country CLTS Coordinator, personal correspondence, 2010) in the form of 'triggering' and 'post-triggering' visits, the health clubs consist of 20 sessions and, where a club facilitator comes from within the community itself, a degree of sustained internal pressure is also present. For behaviour change to persist beyond a project's lifetime it is important that communities continue to receive periodic face-to-face visits from outsiders so as to maintain a focus on measures promoted by the intervention.
- Qualitative data suggests Zimbabweans are more prone to accept the way in which CHCs operate by using what might be termed a 'positive' approach to changing behaviour, whereas the negative emotions elicited by CLTS tended to sit less comfortably with them.
- Whilst CHCs effectively promote hand washing (64% HWF coverage after 6 months), CLTS largely failed to do so. However, although the 'tippy-tap' model championed by CHCs is cheap, effective and easy to build, in the longer term it is likely to break, with evidence suggesting that broken structures tended not to be repaired or replaced. Furthermore, a greater emphasis must be placed on the use of soap when hand washing.

With fewer face-to-face interactions the costs associated with CLTS are lower. In this study they were US$0.19 per person before organisational overheads (H. Chimhowa, PLAN Country CLTS Coordinator, personal correspondence, 2010) as opposed to $0.35–0.91 per person for CHCs, as reported by Waterkeyn (2010). Given that the costs for both approaches are relatively low, however, this comparison must not be considered as being of primary importance if the main aim of health and hygiene development programmes is to address the objectives set out in the MDGs.

In a number of study populations, latrine construction was influenced by one or both of the relative wealth of a community and the amount of cover the location provided. These and other contextual factors have had an influence on the data. However, the results, including those from communities who were introduced to both approaches, indicated that CLTS is more effective than CHCs in encouraging latrine construction. It is therefore a recommendation of this study that the two approaches are trialled together in order to test whether the emphasis CHCs place on hygiene practices such as hand washing can be coupled with the even stronger focus of CLTS on sanitation.

## REFERENCES


Billig, P., Bendahmane, D. & Swindale, A. 2009 *Water and Sanitation Indicators Measurement Guide* (online). Available at: http://www.fantaproject.org/downloads/pdfs/watsan.pdf (accessed 18 May 2010).

Carter, R. & Rwamwanja, R. 2006 *Functional Sustainability in Community Water and Sanitation: A Case Study from South-West Uganda* (online). Available at: http://www.tearfund.org/webdocs/website/Campaigning/Policy%20and%20research/Uganda%20Watsan%20final.pdf (accessed 14 May 2010).

Curtis, V. & Cairncross, S. 2003 *Effect of Washing Hands with Soap on Diarrhoea Risk in the Community: A Systematic Review* (online). Available at: http://www.hygienecentral.org.uk/pdf/CurtisHandwashing.pdf (accessed 24 April 2010).

Feachem, R. G. 1984 Interventions for the control of diarrhoeal diseases among young children: promotion of personal and domestic hygiene. *Bull. World Health Organ.* **62** (3), 467–476.

Gelfand, M. 1956 *Medicine and Magic of the Mashona.* Juta and Co., Capetown.

Kaltenthaler, E., Waterman, R. & Cross, P. 1991 Faecal indicator bacteria on the hand and the effectiveness of handwashing in Zimbabwe. *J. Trop. Med. Hyg.* **94** (5), 358–363.

Kar, K. 2005 *Subsidy or Self-respect? Community Led Total Sanitation: An Update on Recent Developments*. IDS Working Paper 257. Institute of Development Studies, Brighton, UK.

Leslie, J. 1989 Women's time: A factor in the use of child survival technologies? *Health, Policy Plann.* **4** (1), 1–16.

Loevinsohn, B. 1990 Health education interventions in developing countries: a methodological review of published articles. *International Journal of Epidemiology* **19** (4), 788–794.

Neuman, L. 1997 *Social Research Methods: Qualitative and Quantitative Approaches.* 3rd edn. Allyn and Bacon, Needham Heights, MA.

O'Leary, Z. 2005 *Researching Real-World Problems: A Guide to Methods of Enquiry.* Sage Publications, London.

Robson, C. 2002 *Real World Research: A Resource for Social Scientists and Practitioner-Researchers*. 2nd edn. Blackwell Publishers, Oxford.

Rubin, H. & Rubin, I. 1995 *Qualitative Interviewing: The Art of Hearing Data*. Sage Publications, London.

Rukuni, S. 2010 *Challenging Traditional Sanitation Technologies and Mindset through CLTS in Zimbabwe*. Plan working paper.

Tsegaye, Z., Wandera, J., Kitaba, A., Getachew, F. & Tamiru, S. 2009 *The Outsider Factor in Community Led Total Sanitation (CLTS): The SNV Ethiopia Experience* (online), SNV Netherlands Development Organisation. Available at: http://www.snvworld.org/en/Pages/Publications-item.aspx?publication=516 (accessed 6 May 2010).

UNICEF 2010 *Basic Indicators: Zimbabwe* (online). Available at: http://www.unicef.org/infobycountry/zimbabwe_statistics.html (accessed 24 January 2011).

Waterkeyn, J. 2010 *Hygiene Behaviour Change through the Community Health Club Approach*. Lambert, Saarbrücken, Germany.

Waterkeyn, J. & Cairncross, S. 2005 Creating demand for sanitation and hygiene through Community Health Clubs: A cost effective intervention in two districts of Zimbabwe. *Soc. Sci. Med.* **61**, 1958–1970.

Wijk, C. & Murre, T. 1995 *Motivating Better Behaviour Change: Importance for Public Health, Mechanisms of Change.* UNICEF, New York.

WHO (World Health Organisation) 2010 In the market for proper sanitation. *Bull. World Health Organ.* **88** (3), 161–240.

WHO/UNICEF 2010 *Progress on Sanitation and Drinking Water – 2010 Update*. WHO Press, Geneva.

WSP 2007 *Community Led Total Sanitation in Rural Areas: An Approach that Works*. WSP Field Note Series, PS Press Services PVT. Ltd, India.


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