Biosand Filters: Ethiopia May 2009

This case study summarises a monitoring and evaluation visit to Ethiopian Full Gospel Believers' Church (EFGBC) in May 2009, aiming to assess the success of the EFGBC in promoting the Biosand Filter (BF).

Background

EFGBC have particular success in their livelihoods approach to the BF, which is a sustainable way forward to programming. The FGBC Biosand Filter project was a pilot project, which has now ended. FGBC previously had no experience in the BF's physical production, promotion, and household operation.

Response

- Visit two producers of the Biosand Filter (BF)
- Visit BF beneficiary homes, to observe and interview on BF use and impact
- Water resource development visit and discussion
- On-going discussion on promotion of the Biosand Filter

Impact

Visit two producers of the Biosand Filter (BF)

- One producer (Haile Selasee) was using gravel significantly larger than the other main producer (Adamo). End quality comparisons were not made, but it appeared that the larger gravel is not overly large for the wall thickness. However, if the larger gravel sinks towards the bottom of the unit during the hammering of the mould, it is liely that the smaller gravel BF unit will form a somewhat stronger casting.
- Casting needs at least two people, but preferably three.
- Having only one mould each means that a new casing must be removed from the mould within 24 hours, otherwise production is delayed. Haile Selasee says that a second mould is the main barrier to his scaling up production (rather than the increasing price of cement, transport, availability of materials, etc.).
- Cement mix is necessarily more liquid than usual concreting, so as to achieve a smooth exterior surface.

Visit six BF beneficiary homes, to observe and interview on BF use and impact

- All BF actually flowing at times of visit (i.e. in correct use), and all surroundings appeared clean.
- Variations in capturing the flow from the filter outlet -from an open bucket (the least hygienic of all the visited beneficiary practises), a funnel (directing the flow into a jerry can), or a bucket with a small hole cut into the lid and positioned directly below the flow (limiting contamination).
- The greatest concern arose regarding the differing cleaning practises. This is quite alarming because it suggests that the fundamental working of the BF has not been understood, or else ignored. Virtually all visited beneficiaries clean the BF once flow has reduced significantly. Most users then swirl the standing water on top of the sand surface (presumably removing the dispersion plate first), and decanting the dirty water. If that does not improve the flow rate significantly, they will remove either a portion of the sand, all of the sand, or in one case, the whole contents of the BF unit, wash the materials, and replace them. There is no need to regularly remove any more than the top portion of the sand.

- It is what follows the cleaning that is particularly concerning. All but two of the families visited will then proceed to consume the output water as soon as it is clear in appearance, which usually occurs once any remaining pre-cleaning standing water has been displaced. Since the biological film *(Schmutzdecke)* has had no chance to re-form, this output water will still contain pathogens, and is not safe to drink. However, the beneficiaries will mainly associate safe quality with appearance. One family boils the water for a period of three days, and then proceeds to consume the output flow directly, whilst the family of Haile Selasse will use the water within ten days of sand-washing. This suggests that, whilst initial education on using the filter was probably adequate, follow-up in this area is distinctly lacking, and must be addressed to safeguard beneficiary health.

Challenges and Suggestions for dealing with them

Having only 1 mould is a barrier to production.
FGBC might consider subsidising the purchase of a second mould for each producer.
Collection of water in open bucket unhygienic.
Collect flow with a funnel directed into a jerry can; or into a bucket with a small hole cut into the lid positioned directly beneath the flow.
Sand removed during cleaning; water consumed when it looks clear, but before the Schmutzdecke has had time to reform.
Facilitators need to ensure that beneficiaries understand how the biosand filter works – those who are already users need to be reminded.
Once standard maintenance regimes have been ascertained, it is recommended that beneficiaries adopt the "buddy system" as explained by Alice Fay in her visit to the project in October 2006. This involves families staggering their cleaning activities, so as to enable neighbouring BF beneficiaries to share the use of a BF whilst their own is redeveloping *("ripening")* its *Schmutzdecke.*
The FGBC team acknowledge that their own basis for advice on maintenance rests mainly on generic evidence from texts on the Biosand Filter.
A more evidence-focused database is needed, involving water quality testing of key local resources in this area, both input and corresponding output water quality. To record this as a clear database, FGBC should draw up a matrix of bacteriological quality measurements.
FGBC has no water quality testing capacity.
FGBC should enlist the help of another WASH NGO, or enlist the help of a government laboratory. From the results of these water quality tests, FGBC will be confident to give standard and consistent advice, which should be followed up, ideally as a beneficiary self-monitoring programme. This is an essential input which must be implemented, even if FGBC is not intending to scale up the project through its own involvement.

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Looking Ahead, Sustainability and Transferability

The BF is promoted by active messaging and sharing by the replicators and the two producers, along with the opportunities to demonstrate the BF outside schools and clinics. Replication could be accelerated by producing and distributing a much more modern, picture based brochure (demonstrating right and wrong maintenance techniques), instead of the current text-based brochure (which is clearly ineffective in a mainly illiterate community); and some strategically placed billboards (incorporating similar pictures).

Safe sanitation (safe excreta disposal) must essentially be part of any scale-up programme, and would be an extremely effective way of safeguarding beneficiary health. It is recommended that FGBC support an improved sanitation programme, whether or not this is linked to any scale-up project of the BF. Any sanitation programme should ideally match the demand-led / livelihoods basis of the Biosand Filter project, i.e. not involve subsidy, but instead be stimulated by local production and marketing, contingent with comprehensive awareness-
raising, and also training of producers of sanitation components (principally latrine slabs). CLTS would work well in conjunction with local production of the San-plat, a small, relatively low cost latrine slab, which can be made using the same skills as used for making the Biosand Filter.

The Tearfund-supported open reservoir project (a concrete lined reservoir with a capacity of 83,000m³, with water being abstracted at two water points in the village through gravity-fed pipes), appears to be an ideal water source development project for the Biosand Filter, and a very appropriate intervention for this region. The reservoir is empty prior to the rainy season, and the community to clean out the debris in the reservoir before the rains come in strength. The community should construct a fence (hedge barrier) arround the reservoir, which would serve to keep out animals and help prevent gross contamination from animal defecation.
Many homes in the area have corrugated iron roofing, but there is very little roof water harvesting, which would be a valuable means of complimenting annual water supply. However, the high cost of cement would make building ferrocement tanks or water jars unaffordable for many families. It is recommended that FGBC work with other WASH stakeholders to negotiate subsidising cement for rainwater harvesting purposes.

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