Bio sand filter: a household water treatment options in Cambodia

Water ideally should have no, or a low, contamination risk to benefit human health. This is also economically beneficial – reducing the likelihood of water borne disease for example can reduce curative medical costs and increase the time available for household members to work or for children's education for greater income potential. However the majority of village water sources are usually contaminated. House hold water treatment (HWT) can play an important role in providing low cost and low maintenance safer water for rural communities.

Some of the more common HWT practices in Cambodia are boiling or filtering. Wood is usually harvested and used for boiling and this is a drain on forest resources as well as a family's income when buying wood fuel. Filtering has the advantage that after the initial cost the operation cost are usually very low. IaW recognized that options for consumers are an important and users should ideally have choice – for preference reasons as well as social, economical, environmental and technical reasons. But also for entrepreneurial opportunities as well. If we can offer additional options or alternative methods that have manufacturing possibilities which are aimed more towards rural communities then the local economy is given a boost.

One of the HWT options promoted in Cambodia is the Bio sand filter.(BSF) The BSF is basically a container partially filled with graded sand and gravel. Water is poured into the top of the unit and is filtered as it passes through the sand. The raw water is biologically improved partially through predation in the biological or 'schmutzdecke' layer as well as the sand providing a natural mechanical barrier.

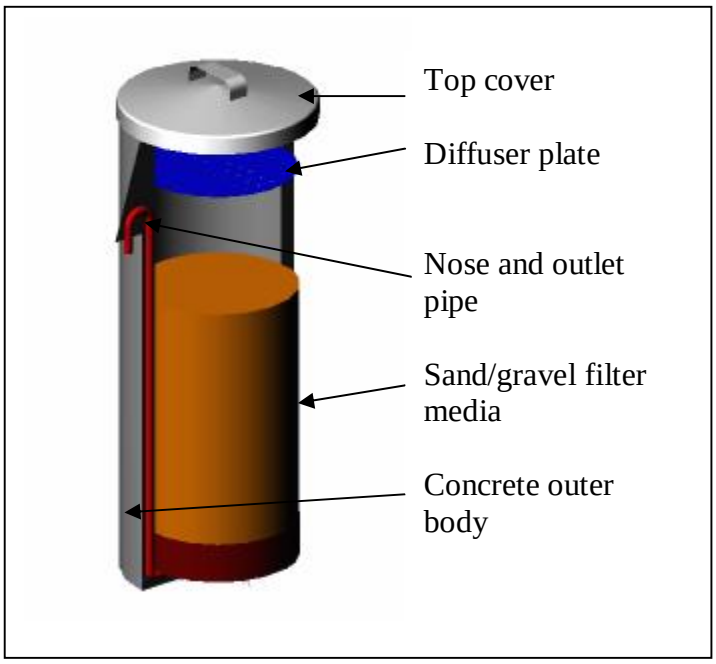

Figure 2 Cut away view of the Round Bio Sand Filter

Ideas at work recognized that the square BSF units typically used within Cambodia were extremely costly and very heavy. To improve this IaW were keen to follow the experience of Medair and their round BSF because of the advantages that this type of unit offered. Typical cost for square filters moulds made by local workshops and other NGO's have been around $350. To reduce the cost of the round BSF mould we are currently working on utilizing and making modifications to existing moulds used for producing cement pipes (for storm drainage). These basic moulds cost around $85 for the standard mould and are widely available throughout the country and the skills and production facilities for

making these are well established. These standard pipe moulds can be modified to allow the base to be sealed off and to add the additional nose cone as standard. The cost of final modified mould is estimated to be around $150 which is less than 50% of the square filter moulds. The amount of concrete used in the square filter is around 20% less as well which provides significant savings on materials costs as well.

The actual round concrete BSF units produced are approximately 915mm high with an outer and inner diameter of 355mm and 295mm respectively. The filter depth is approximately 450mm with a surface area of around 0.07m^2. The designed flow rate for the filter is around 0.6ltr/minute.

Design and production work of the latest round BSF mould is on going at present. IaW wish to express their thanks to Millie Adams of CAWST for her feedback and recommendations during this stage.