

## Soil Stabilised Blocks

*Tearfund is committed to protecting the environment in all its work, both through partner work and in countries where we work directly.*

*Since 2008 in our operational programmes in Darfur, Sudan, Tearfund has piloted the use of Soil Stabilised Blocks (SSB) as a low cost environmentally friendly construction technique. This initiative has been successfully used in our water and sanitation activities (building of latrines etc) as well as construction of classrooms. We are aiming to share this good practice and learning from Sudan with other stakeholders who work in similar areas.*

*The information below details some of our programmatic work with SSBs in Darfur and outlines some of the benefits of SSB, notably on the environment in terms of conserving trees and water. It also shows some of the challenges encountered along the way and how they can be overcome.*

*This case study is taken from a more detailed paper that was written by our Water and Sanitation Advisor in Sudan for the 2011 35<sup>th</sup> WEDC International Conference. It can be accessed at <http://wedc.lboro.ac.uk/knowledge/know.html>*

### The issue: Deforestation in Darfur

Environmental resources are crucial to people's lives and livelihoods in Darfur. A common livelihood for many is brick making but this is placing an unsustainable demand on the natural resources available. Making bricks requires large quantities of wood to fuel the kilns, which combined with domestic firewood needs, is resulting in large deforestation. Rough estimates indicate that the brick kilns consume over 52,000 trees-worth of wood per year. It is in light of this that Tearfund has taken up the use and promotion of Soil Stabilised Blocks (SSBs).

### What is a Soil Stabilised Block?

Stabilised Soil Blocks (SSBs) are building blocks made from ordinary soil mixed with a small amount of cement and water. They are highly compacted in a block press, resulting in a low cost solid and building block.



*Building a school in Kass, South Darfur with SSBs*

### Tearfund's programmes

Tearfund began using Soil Stabilised Blocks (SSBs) in 2008 in programmes in West Darfur. Since then it has been expanded to all Tearfund Sudan programme areas, in both South & West Darfur. Tearfund's response has been primarily around:

- *Training*

At the beginning of this work Tearfund staff were trained up in the use of SSBs and then cascaded their training to selected members in communities. This was followed by setting up partnerships with technical colleges in the various localities to train them to undertake the training of the communities themselves. Tearfund also supplied the technical colleges with materials and some of the students later went on to work with Tearfund in SSB making.

- *Construction*

In total Tearfund purchased 20 Stabilised Soil Block machines which were distributed in programme areas. To date Tearfund has constructed 39 multi compartment latrines and 53 classroom blocks using SSBs.

- *Advocacy*

Through in-country advocacy, Tearfund has encouraged other NGOs to adopt the use of SSBs in their programmes in Darfur. Catholic Relief Services, for example, have implemented school building and shelter programmes using SSBs. UNICEF have also adopted the approach of using SSB in all their school construction work.

## Benefits of SSB

### Cost comparison for a 4x4 meter house

Required	Burnt bricks	Stabilised Soil Blocks
Number of bricks	13,824	1,644
Price/brick	\$0.8	\$0.36
Size	18x9x5cm	29x14x12cm
Total price of bricks	\$1,105	\$599
Cement, sand and mortar	\$750	\$142
Water	12,000 litres	6,000 litres
Trees cut	14	0
Construction labour cost	\$4,00	\$300
<b>Total cost</b>	<b>\$2,255</b>	<b>\$1,041</b>

Adapted from UNHABITAT (2009).

As per the above table the benefits of SSB include:

- Conservation of trees & water
- Reduced labour costs
- Other cost reductions e.g. no need for plastering with SSB's so they can be painted directly.

Communities have expressed their satisfaction with SSBs because of the enhanced skill base it gives to the community and the prospect of a new livelihood activity. Contractors and builders have noted that SSBs appear aesthetically pleasing and are better in terms of evenness which makes construction easier.

## Challenges

From Tearfund's experience the following challenges were encountered:

- **Machine availability:** Communities trained in SSB production need to continually use the machines to maintain their skills.
- **Quality of the blocks:** the blocks could develop weaknesses due to
  - Lack of availability and high price of cement
  - Suitable soils not being available

To counter this Tearfund has been investigating incorporating soil identification into the training on SSB, and exploring alternatives to cement such as locally available lime. Tearfund continues to gather field based evidence to support the use of SSBs in comparison to fired bricks.



Pouring the sand, cement and water mix into the mould to make SSBs

## Recommendations



Communal latrines in Ed Daein South Darfur made with SSBs

SSBs are a low cost environmentally friendly technology which when adopted can help reduce deforestation. In Sudan we would encourage SSBs to be the construction method of choice by NGOs, UN and governments, where appropriate.

Organisations and governments should invest in communities by training them and also acquiring SSB machines for their use so they can start production of the blocks and organisations and others in the locality can then purchase these materials for all construction efforts. Specifically technical colleges that commit to train students in SSBs need to be well supported.

NGOs using SSBs should document their experiences and share information with other organisations in order to encourage the scale up and buy in of this technology. In particular they should share examples of SSB construction techniques, different buildings constructed, any information on challenges met and any other further developments that might be of use to others working in this area. They should begin dialogue with relevant ministries in their countries to get them to consider the use of SSBs as a nationally supported initiative. NGOs should also prioritise production of maintenance and construction manuals and make them accessible to communities based groups and many more vocational schools so they can in turn offer training.

For more information please contact  
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