Cement lined tanks for rainwater harvesting

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OXFAM (UK/I) has been working in the northern regions of Somalia/Somaliland since 1991 following the civil war. OXFAM originally donated emergency water equipment for the rehabilitation of rural boreholes and urban water supply systems. Operating conditions in Somaliland were extremely difficult, with widespread rural and urban insecurity. The implementation of the programme ceased in September 1992, due to a deterioration in security. During this time we learned that deploying high value equipment to a small number of sites and communities was counter-productive because it created jealousies and competition for resources resulting in tensions and conflict, and the equipment was easy to loot. Sustainability was lacking because of these tensions and the lack of any maintenance and support structures.

Rural Somaliland is a clan-based, mainly pastoralist society, very individualistic and competitive, especially regarding pasture and access to water. Wells and boreholes are sites where conflict can erupt. In 1993 Oxfam's work was reformulated, since when we have focused on the rehabilitation of reservoirs and small open sunken cement lined tanks (known as “birkads”), usually rectangular in shape and about 15m x 12m x 3m in size. There is sufficient surface run off so that a “birkad” can be filled in a single rainstorm. “Birkads” are privately owned, and they serve both human and livestock water needs.

Initial planning included consultations with elders, ministry officials and other agencies. This was followed by a field survey to identify priority needs of villagers in the Galbeed region of Somaliland. We used the following criteria: areas where refugees would return to; not being duplicated by other agencies; sites of water shortages; sites where the communities were ready to take responsibility for the rehabilitation of their water facilities but required small inputs and technical assistance; sites where our intervention will not create environmental problems or sustainability. The opportunity was taken to introduce new and improved skills to village masons, such as ferrocement techniques - reinforcing the mortar with a layer of chicken wire mesh, spread at the floor base and rolled up the vertical walls. We included training for the village masons.

An initial training course lasted 5 weeks. 28 village masons in 5 village centres were trained to rehabilitate the “birkads” using ferrocement techniques rather than cement mortar alone. Training included practical demonstrations in the making and use of reinforced cement such as the cement mixing ratio, water quality, selection and cleaning of sand, reinforcement and use of the wire mesh, and curing. The training was very successful and provided good motivation, a key factor in the implementation of the project.

An analysis of people’s use of “birkads” during the year indicated that peak dependency occurs during the dry season between the “Deir” rains (Oct-Nov) and “Gu” rains (April-June). Although it would have been desirable to complete the work as swiftly as possible, it is practically impossible to carry out the cement work during the dry season for lack of water for mixing the mortar and for curing. The community advised Oxfam to wait for the wet season as only then would sufficient water be available and also the rain would wash the sand, which is freely available from sandy tracks and gullies, so that there would be less impurities in it.

So, from the beginning, the elders, men and women were involved in the planning. They selected the “birkads” to be repaired, appointed which masons were to be trained and agreed to pay for the masons’ services. They agreed also to look after the material inputs such as cement and wire mesh, and store these without charge in their villages. They also dealt collectively with trouble makers.

We have identified two key aspects of the sustainability of our work with “birkads”. Firstly there is the sand, water and payment of the labour force both skilled and unskilled.

During the survey we saw wide variations of “birkad” workmanship, both in original construction and in subsequent repairs. The combined effects of war, absence of maintenance during the displacement years, and poor workmanship between them had caused significant deterioration: out of some 3,200 few were capable of holding water. Rehabilitation needs ranged from fixing numerous cracks to major reconstruction. The survey led to a decision to rehabilitate some 430 “birkads” as part of Oxfam’s programme to improve rural water resources.

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sustainability of the project; secondly the sustainability of
the “birkads” themselves.

As mentioned earlier Somali culture is strongly clan
based. These clans show typical “fission and fusion”
characteristics. This means that while people will come
together and cooperate at different clan levels over issues
of mutual interest or mutual threat, such as feuds or the
payment of compensation, in other situations different
clans and subclans are in competition with each other for
resources for their own benefit. It is therefore very diffi-
cult to encourage people to come together to work for
their mutual benefit, or where the immediate benefits are
not equally shared.

There are continuous internal clan tensions, which can
easily lead to conflict and rifts between different clan
sections. It also means that there is a tendency towards
individualism: it is very hard to encourage community
cooperation and joint participation. “Community” in
Somaliland is not easy to identify and this makes it very
difficult for organisations such as Oxfam who try to work
on community development projects and with commu-
nity participation processes. Furthermore, most benefi-
ciaries have previously been only passive recipients. This,
combined with the strong competition for resources, has
led to a situation characterised as “aggressive depend-
ency” - a high expectation that others would do the job for
them without any participation but very active seeking of
benefits and resources.

As might be imagined, historically maintenance of and
participation in communal resources proved very diffi-
cult to sustain in the Somali context. From the start of this
project Oxfam consulted locally, but in implementing the
project we chose to work through individual “birkad”
owners, there being very few “birkads” which are pub-
lcally owned.

By working with “birkad” owners Oxfam has been able
to appeal to their self interest, as they benefit from the inputs
and the sale of water, while being sufficiently motivated to
put in their own auxiliary inputs and employ the Oxfam
trained masons. Consequently in this way we have been
able to increase water supply in the rural areas, which is the
main objective of the project, meeting a priority need as
expressed in the initial survey.

The population of the project area, including “birkad”
owners, is mainly self-repatriated refugees and they face
many problems affecting the sustainability of the
“birkads”. Cement and chicken wire are imported and
expensive: wire mesh cannot be purchased locally at the
moment, while cement is expensive. This makes it diffi-
cult for the project to continue without Oxfam’s assis-
tance. Some of the “birkad” owners are still in the refugee
camps and they find it hardest to start again since they lost
so much during the war.

Having contributed towards the rehabilitation of a
“birkad” its sustainability is then in the hands of the
owner. Much depends also on the consumers of water.
Pastoralists are mobile with opportunistic search of pas-
ture and water. Their herds are still being rebuilt after
losses during the civil war, so their demand for water is
still growing. If a water source dries up, the nomads move
on another source. Their demand on the “birkads” will be
contingent on rainfall and migrations. Sedentary and
agro-pastoralists, many of whom also own “birkads”,
have smaller herds which graze in village enclosures, so
they are a more constant market and more dependent on
the “birkads”. So their “birkads” are their water supply
for the whole year and also a source of income as water
can be sold to herd owners. Through management of the
water in the “birkads” and by linking this to seasonal
demands for water, the “birkad” owners should be able to
ensure income to cover maintenance of their “birkads”.

Although actual rehabilitation of the “birkads” is man-
aged and carried out by the owners and the masons,
Oxfam has exercised as tight control as possible over
inputs and because this control is from an external agency
we have overridden internal clan dynamics while appeal-
ing to the self interest of the owners and the needs of the
rural population. The approach is to distribute a small
amount of inputs, evenly, among a wide number of
“birkad” owners, as chosen by the local population. Each
specific input is not worth fighting for or looting. Each
clan gets their share of the inputs and the decision mak-
ing.

However, as Oxfam continues to maintain the control
over the inputs it is arguable that we are not encouraging
sufficient local management of the projects and capacity
building at a local level. This may affect the long term
sustainability of the project. This is a dilemma as there
are worries, based on an analysis of the clan structures
and of past experience, that local management will in-
crease clan pressures for control over resources and
therefore increase tensions and arguments arising from
these pressures. Further more, accountability over the
inputs might disintegrate in the rush to gain access to
them. So within the project there is a tension between
tight control and increased local participation.

The challenge is therefore to encourage greater local
participation and capacity building without losing the
momentum of the project and while maintaining as much
accountability of inputs as possible. It is hoped that
participatory rural appraisal will be one tool we can use
to reconcile our dilemma.

Although the project has not yet been evaluated, it
seems that people are grateful for Oxfam’s assistance and
there is a sense of happiness among the villagers to see
someone who is encouraging them to do something for
themselves. The project has generated a lot of good will at
the grassroots level - and this has enabled nearly 350
“birkads” to be rehabilitated since April 1994 by the rural
population with Oxfam’s assistance.