



engineers without borders uk

**Short Report for IHT Foundation:
NAKRUDA Project 2008-2009
Dadiya, Gombe State, Nigeria**

Placement volunteers:
Jonathan Baker, Ash Rohani & Phil Moutousamy

Introduction

This report summarises the activities and projects carried out by three EWB-UK volunteers during their 6-10 month placements hosted by the local community-based organisation Nakwai Rural Development Association (NAKRUDA). Our three volunteers have worked extremely hard on their placements. They have maintained our excellent relationship with the community and have worked with NAKRUDA to develop the original earthen road project – through careful research, design and implementation – to include stream crossings and culverts that are appropriate to the region. It also must be emphasised how challenging day-to-day activities are in this environment, which makes their achievements even more impressive.

Background

In 2004, NAKRUDA (Nakwai Rural Development Agency) was formed as a community-based organisation and subsequently registered to further the sustainable development of the Dadiya people. It operates solely in the Dadiya region of Nigeria.

The Dadiya people are a small ethnic grouping occupying a large rural area of savannah and hills, with streams, springs and a major seasonal river. There are over 55 settlements spread throughout its lands and its main settlement is Lokulakali where the volunteers stay.

NAKRUDA and EWB-UK have been working together since 2005. There have been three successive nine-month placements each of two volunteers. This report covers the latest placements of Jonathan Baker, Ash Rohani, and Phil Moutousamy. All of the volunteers have had good experiences with NAKRUDA, and the organisation has expressed a keen interest in maintaining links with EWB-UK as well as hosting volunteers.

The volunteers' main role was the improvement and development of an earthen road network which links the small villages of the region.

Jonathan, Ash and Phil were due to continue this work, with a particular focus on constructing permanent water crossings. However, during the placements, NAKRUDA's funding for the crossings was not released from the regional government in good time. The volunteers therefore developed a number of other related projects to enable to deliver maximum input with the reduced funds available to NAKRUDA.

Example project: Sand Bag Ring Culvert

Due to a lack of funding from the regional Community Based Poverty Reduction programme for the construction of the planned concrete culverts in Dadiya, the EWB-UK volunteers proposed an alternative solution of constructing dry-stone culverts for the smaller crossings. However, after an extensive surveying programme it was concluded that the geometry of the culvert sites was not appropriate for dry-stone construction. There were also concerns over the long-term safety of such a crossing. Dry-stone construction would have offered the benefit of being low cost, with materials sourced from the surrounding landscape. It would have also offered locals a way of utilising their historic dry-stone craft.

During the dry-stone culvert investigations, it was discovered that some of the internal road network had been scheduled by the government for construction, though with no certainty. It was decided, therefore, that an attempt should be made to construct a culvert that was low cost and – to an extent – temporary in response to the government's construction plan.

Following an extensive 'optioneering process', an alternative design for a sustainable and appropriate culvert was developed. From this, a sandbag ring culvert at the Lotokalan culvert site was designed and implemented. Over a one month period, a small team successfully built the culvert for a construction cost of £200. The community learned a great deal from this innovative engineering solution, which provided an example for more culverts in the future built using only local labour. The EWB-UK volunteers managed the project, with a view to replication.

The construction process began with the excavation of loose ground material at the base and sides of the culvert, to a depth where firm ground was reached. This solid base was levelled and tamped before a layer of sand-filled sewn-up cement bags were laid as a base. Six recycled concrete rings were then set out. Additional sand filled bags were packed around the rings to a height 0.75m above the rings, to ensure that vehicle loads were able to spread over the rings adequately. Additional filled cement bags were also used to construct the culvert approaches. In total approximately 800 cement bags were used.

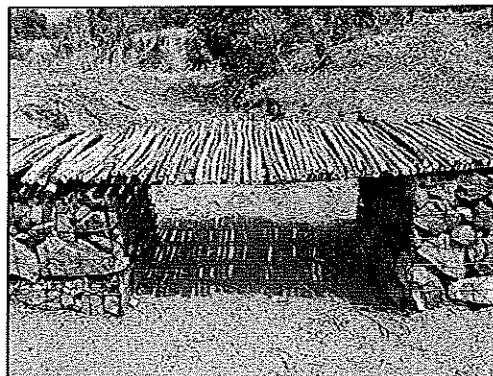
A stone wall was then built up against the exposed surfaces of the cement bags to protect the polymeric bags from ultraviolet degradation. The stone wall was extended to cover the wing walls. For durability and maintenance purposes, cement slurry was used to fill the gaps in the stone wall. For the road surface, a mixture of clay, sand, and gravel was applied onto the cement bags, wetted and tamped. Rocks were placed at both the inlet and outlet of the ring culvert to protect against scour.



Other projects

- Maintaining their focus on transport infrastructure, the EWB-UK volunteers assessed and recorded the existing road network. This was the first time this work had ever been done. They were able to use GPS references to produce a map of Dadiya, which will be used in future projects by both NAKRUDA and the government (and will hopefully be shared through online mapping services).

- Drainage problems around existing constructions were causing significant problems and risks as stagnant pools of water had formed due to excess water runoff. The EWB-UK volunteers helped NAKRUDA to create small soak-aways to relieve these problems.
- In another example of a solution made appropriate to the context of Dadiya, the EWB-UK volunteers demonstrated to NAKRUDA and the local labourers methods of extending the earthen road network by building small bridges out of gabions. This was the first time that the gabion technique was used in Dadiya, and it is a particularly appropriate technique given the regular flooding. The bridge that was built as a test case was designed as a crossing for use in the rainy season – one that could be easily repaired or replaced when damaged by the flood waters.



The EWB-UK volunteers also undertook other projects, including the development of a small wind turbine for the village health centre and the construction of a community centre, but these projects were not funded by the IHT Foundation and so are not covered in this report.

Cultural Experiences

As in previous years, the volunteers formed strong bonds with the local community, taking part in various social events and celebrations. The volunteers were lucky enough to be present for the five yearly 'Kall' festival, which is a two week long coming of age celebration where the local youth officially become men. The volunteers also witnessed the Lokalokali District Head, Baba Kena, get turbaned at separate ceremony. The volunteers were also turbaned and given Dadiyan titles; Phil – 'Jakada' (Ambassador of Dadiya), Ash – 'Maidala' (one who is dedicated and cares for Dadiya), Jon – 'Tamarao Lo Kalokoli' (Star of Lo Kalokoli – the name of the village). In addition, there was the requisite sampling of the local tonic, guinea-corn juice, which has always been a talking point of returning volunteers.

Next steps

This project has undoubtedly been successful, with the volunteers adding significant value to the community and building local technical capacity in many different areas of need. None of the projects would have been possible without the initiative of the EWB-UK volunteers or the support from the community and NAKRUDA.

Whilst the 2008-2009 project was a success, it is clear that until a definite source of funding is available for NAKRUDA there is a potential risk of sending volunteers who may struggle to share their skills effectively. EWB-UK has decided, therefore, not to send placement volunteers in the coming year, but rather to support NAKRUDA from afar in securing its promised funding from the regional government for the major work on the road network.
