

Background

"We can do so many things now that we have light. The truth is that we are very happy, we never thought the project would become a reality so soon."

Doris Cruz who benefits from a recently completed Micro Hydro Scheme, Lambayeque, Peru

Since late 2007, the families of Chambamontera, Northern Peru, have been working with Practical Action to bring electricity to their remote, hillside community.

By harnessing the power of water, hundreds of poor women, men and children will be able to enjoy the benefits of access to electricity for the very first time. Given the relatively high cost and low priority of rural electrification, Chambamontera would most likely have continued to be without modern energy for many generations. Through micro-hydro power, this project is helping ensure that the children of Chambamontera will grow up with access to clean, reliable energy.

The construction of the Chambamontera micro-hydro¹ scheme is being made possible as a result of the generous support of *THE MATTHIESEN/ORBIS PICTUS FOUNDATIONS*, and other donors, in addition to local people's contributions of funds (through a soft loan), materials and labour. This report highlights some of the main achievements of the project since the last progress report was submitted to the Foundations, in March 2008.

Project overview

Micro-hydro power can dramatically improve the lives and livelihoods of poor rural families.

The energy, which will be generated once the Chambamontera scheme is fully operational, will enable people to reduce the drudgery which dominates their lives, and provide opportunities to develop new and more productive ways of earning a living.

(Photo: Family have access to a refrigerator due to power supplied through a micro-hydro scheme)

The benefits of micro-hydro schemes for isolated communities are significant and include:



- Providing a source of energy which is renewable and 'fuel-free'
- Long system lifetime, typically 25 years or more
- Electricity being available when people need it most (more hydro energy is available in winter when heating demands are high)
- Low maintenance requirements and running costs
- Little environmental impact during installation-

¹ Micro hydro refers to hydro power systems with a power rating of 100kW or less. A 100kW system will produce 100 standard units of electricity in one hour.

As a result of the micro-hydro scheme being constructed in Chambamontera, some 60 rural families will directly benefit from access to energy. A further 100 families, living in neighbouring villages, will also be able to develop new income generating activities and improve their home environment. In addition, the project is enabling the local community to become confident in maintaining and managing a micro-hydro scheme, providing the opportunity to drive their own development.

Project activities

Despite the considerable effort of project staff and local families over the reporting period, progress was not as substantial as anticipated.

This was largely as a result of some difficulties with owners of the land on which the civil works, such as the conveyance ditch, penstock and powerhouse, were to be located. When the feasibility study was carried out, there were no issues with the land owners but, once initial work began, problems were encountered. Due to the influence of other local people demanding money, the landowners saw an opportunity to do the same. The community of Chambamontera agreed to pay the landowners compensation but the amount requested was far higher than that which the community were able to offer.

As a result of these problems, new routes had to be identified and designed (on two occasions) with similar characteristics to those initially planned, in order not to alter the power of the micro hydro scheme. The permanent site has now been confirmed, agreements with the (new) land owners have been reached and the civil works have begun.

With reference to construction work, progress has been slow because local families have been busy harvesting their coffee between May and August.

Coffee farming is the main way in which women and men earn a living and is the driving force of the local economy, which explains the limited participation in the project of the families of Chambamontera over the period.

(Photo: Local girl sits amongst harvested coffee beans)



In addition, there was a delay in signing the loan agreement; this has slowed the disbursement of the soft loan which supplements the funds donated by *THE MATTHIESEN FOUNDATION* and others.

As a result, the expected completion date of the project has been postponed. It is now being anticipated that the scheme should be fully operational and benefiting the families of Chambamontera in January 2009.

A number of the most significant achievements during the reporting period are highlighted below:

- *Community gained access to credit* – Practical Action staff have worked with the local community organisation (formed as a result of the project) to assist them in applying for a soft loan to support the construction of the micro hydro scheme.

- *Land access agreement reached* – To help to ensure good, future community relations, the owners of the land on which the civil works and medium voltage grid will be located have been participating in the project and positive relationships are being developed.
- *Materials purchased and transported* – All the necessary materials are now located at the project site, including the local materials supplied by community members and those purchased through the project. A foreman has also been hired, who will oversee construction at the site and supervise local workers.
- *Construction work began* – The intake weir and conveyance ditch are now in the process of being built. Over half of the construction of the weir and ditch has been completed to date.



(Photos: Excavation of the conveyance ditch and the intake weir under construction)

In a number of discussions, *THE MATTHIESEN FOUNDATION* had suggested that consideration should be given now to providing the basis for adding a second generator in the future (including upsized pipework, a divided spillway and a concrete mounting base in the powerhouse). Particular interest was shown by the Foundation in encouraging the project to install a second concrete mounting base, in anticipation of a second generator being installed in the future. These helpful suggestions were considered by the project team and it was concluded that the best solution lay in installing a 20 kW micro hydro scheme. This power will ensure that demand is met until the year 2028, based on the team's experience that communities in such rural areas have a growth rate of no more than 2.5% per year. As a consequence, therefore, the proposed phased solution would not be needed.

During the coming reporting period, the majority of the project's activities will take place. These include:

- Completion of the intake weir and conveyance ditch and the construction of all other civil works (settling basin, forebay tank, penstock and powerhouse).
- Purchase of electromechanical equipment and accessories for the electricity grids and household connections.
- Organising the local management of the micro hydro scheme

Finance

Item	Matthiesen Foundation
	(£)
Civil works	4,769
Intake weir	436

Conveyance ditch	1,113
Sand trap and forebay tank	513
Penstock and anchors	1,836
Powerhouse	871
Electromechanical equipment	3,745
Regulator	2,667
Assembly and start-up	1,078
Electricity grids	8,417
Primary grid	4,359
Secondary grid and connections	4,058
Implementation expenses	615
Management model	615
Overhead (8%)	1,404
Total	18,950²

Thank you



(Photo: Local men carry the turbine casing to the micro hydro site)

On behalf of the women, men and children of Chambamontera, please accept our thanks.

As a result of your support, over 60 families will soon have access to the power to improve their lives and prospects.

For further information, please contact Warwick Franklin on telephone number 01926 634446 or email warwick.franklin@practicalaction.org.uk

Practical Action, the working name of Intermediate Technology Development Group Ltd, is a British charity (Registered Charity No 247257) that aims to build the technical skills of poor people in developing countries, enabling them to improve the quality of their lives and that of future generations. We have offices in Bangladesh, Kenya, Nepal, Peru, Sri Lanka, Sudan and Zimbabwe, together with a head office in the UK. The charity was founded in 1966 by E F Schumacher, author of the book "Small is Beautiful".

All Photographs: Practical Action/Peru

² The total donation equalled £21,055, with 10% allocated to management and support as per the original proposal.