

## Case Studies - Practical Answers (2004-2009)

DFID funded Practical Action's Practical Answers project until March 2009.

### CASE STUDY 1      Bicycle Ambulance Uganda

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Case study from the internet

<http://allafrica.com/stories/printable/200604120475.html>

**New Vision** (Kampala)

NEWS

April 12, 2006

Posted to the web April 12, 2006

By Sheila B. Gashishiri  
Kampala

A modified bicycle has been introduced in Jinja to work as an ambulance to rush patients to hospital.

Arise Africa International, an NGO in Jinja, in co-operation with the district directorate of health services, has come up with the innovation. Practical Action provided expertise through funding from Altrincham Baptist Church in the United Kingdom. A few people were trained at the Nile Vocational Institute in Njeru, and these made the bicycle ambulances.

Mike Wright, the head of the team from Altrincham Baptist Church, said the total cost of one bicycle ambulance is \$150 (sh277,500). To him, however, it is priceless.

"It will definitely save many lives," he said.

Poor transport and ambulatory services have greatly hampered the delivery of quality health care services in the district.

Patients, especially pregnant women in labour, can hardly afford to transport themselves to the nearest health facility to receive medical care. Poor accessibility and lack of public transport affect many areas. Cars are rare and people walk or use bicycles to get around.

The idea was already there - people used to build bicycle trailers to take goods to the market, said one of the people trained to maintain the bicycles. The next step was to adopt them as 'ambulances'.

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The bicycle ambulance is proving very successful. Local specific adaptations to the basic technology ensure maximum efficiency, durability and appropriateness for the community.

"People have appreciated this bicycle," says Wilson Mwanja, the in-charge at Busede Health Centre III which, together with Mpambwa Health Centre III, were one of the first health facilities to receive a bicycle ambulance in Jinja district.

The two-wheeled trailer is made from moulded metal with standard rubber-tyred wheels. The 'bed' section can be padded with cushions to make the patient comfortable, while the 'seat' section allows a family member to attend to the patient during transit.

One ambulance trailer costs \$70 (sh129,500) and \$25 (sh46,250) for the coil shock absorber spring.

In response to user comments, a trailer cover has been designed to give protection to the patient and attendant in poor weather. Made of treated cotton, the cover is durable and water proof. The trailer cover costs \$25 (sh46,250). A dedicated bicycle is needed to pull the ambulance trailer using a joining mechanism that can be easily removed and attached. The modified bicycle costs \$30 (sh55,500).

"We know that if our poor communities are given even half a chance to save their own lives, they will offer their all and even build better ones for their families for the future," Mwanja said.

"It may not be the smoothest of rides," he says, "but she made it to the health facility in a few minutes," he adds while pointing at a mother who has just delivered.

True, it may not be the fastest or the most comfortable way to travel but in case of medical emergencies, it remains the only readily available means of transportation in Busede sub-county.

"The bicycle ambulance is easy to operate, manage and use. No need for fuelling. You only sign for it at the health facility at no cost and your patient will be delivered to the facility," said Hassan Ndiko, a beneficiary.

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### **CASE STUDY 2      Mwamba wa Nyundo Womens Group - Kaloleni Mombasa**

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C\O Mary Muramba of Mwamba ya Nyundo Polytechnic

Mwamba wa Nyundo Womens Group is a Traditional Birth Attendants (TBA) group based in Kaloleni Mombasa District. This is an organized group which consists of 30 women. Kaloleni is in the rural area and for one to get some of life necessities one has to go all the way to Mombasa. When the women approached Practical Answers they knew what they were looking for; they had done a survey in their area and identified their needs in the community, one of their priorities was fresh bread. Their initial enquiry was on bread baking. Julius Njagi a Practical Action staff member visited the group and talked to them. He realized that although the group needed the training on bread baking they did not have the appropriate equipment.

Julius Njagi arranged equipment purchases on behalf of Mwamba wa Nyundo which was then put into the Polytechnic. It was agreed that the women would use it for hire but not own it. Ten out of the 30 women were trained for two weeks on bread making and small business management skills. The women decided to include 3 men in training so in total thirteen people were trained. Practical Action Kenya provided the extra training.

Currently the group makes 180 loaves per day at Ksh10 each. For every loaf made, the group is charged 50 cents by the Polytechnic for maintenance of the machines. The group is well organized and receive orders from other organizations working in the area including World Vision when they have community meetings. The demand for fresh bread is so high the group is not yet able to meet it. Mwamba wa Nyundo would like to build on the experience and train other women's groups in Coastal Province.

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### CASE STUDY 3      Stoves for additional income, Nepal

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Jun Bahadur Chepang, 32, lives with his wife in a two storied mud house in Bhumlichowk Village. He obtained technical information on stoves and biomas through a written enquiry. When he was visited by the Practical Answers monitoring team he invited his wife to demonstrate their stove and show the bio gas unit installed beside the kitchen. They explained how it manages all their household waste and the compost is used to grow vegetables.

*"With the benefits come responsibilities," says Jun. "I feel that it is my duty to tell people about the long term benefits of biogas and the improved stoves and the importance of maintenance for sustainability."*

Jun had earlier participated in an exposure visit to Ilam district along with 13 other villagers. The purpose of the visit was to learn about the 'Renewable Energy Technology Promotion Programme.' The participants learned how to make energy efficient stoves and the opportunities of renewable energy. Jun now makes stoves as an income supplement.

*"This isn't entirely new to me," says Jun, "Earlier I needed a book to make stoves to sell but now I have it all in my head. Recently I made three stoves and them for NRs. 500 (£4.00)".*

When Jun makes stoves for his community he explains the importance of energy efficiency, how the stoves help, and how to handle them to make them last. He also promotes awareness about indoor smoke and makes sure that people understand the importance of clean kitchens and proper ventilation.

*"People listen enthusiastically when I tell them about the harmful effects of indoor smoke. I feel empowered and people encourage me to keep talking about it," he adds.*

Jun wants to learn more so that he can make different types of stoves for his community. "If I get a book that shows me how to make different kinds of stoves, I think it will be enough," he adds.

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### **CASE STUDY 4 Villages keen to build toilets, Nepal**

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The Technical Enquiries service has been used to extend the outreach of Practical Action's work on basic sanitation in Nepal. It does so by providing the rural poor with information on the problem and alternative responses. One example of this work was the preparation and dissemination of a 15 minute documentary on 'Health and Hygiene' produced by Ankhi Jhyal based on experiences in Urlabari village in Morang district.

At one sitting more than 70 people from 11 villages in Gorkha district watched the documentary. It showed how households in Urlabari village had benefited from building their own toilets. Before almost every household would defecate in the open polluting the only nearby water source. Open defecation had caused many children and elderly to fall ill creating a strain in their families. The film shows how the people of Urlabari went about building toilets, even adapting the design.

The response of the Gorkha villagers was then monitored. Upon watching the documentary they requested further technical and financial information from Rakesh Shrestha a local Practical Action Project Officer and partner NGO CCODER before returning to their villages. The participants then set about influencing their neighbours to build their own toilets. Out of 231 households in 11 Gorkha villages, 213 signed up to the scheme and are in the process of constructing their own units, 18 are complete. By linking the Practical Answers information systems work to a wider sanitation programme run by Practical Action, some extreme poor households have been able to access small loans.

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### CASE STUDY 5      Smoke hood rescues Nima and her family, Nepal

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In one of the most isolated districts of Nepal, Rasuwa, Practical Answers is helping families like Sonam and his wife Nima. Sonam is linked to the Practical Answers scheme as a local educator and information provider. He cultivates 16 Ropani (0.8Ha) of land while Nima works round the clock cooking and taking care of their cattle.

Nima's kitchen is also the family bedroom. It is poorly ventilated and the indoor smoke has caused Nima health problems. Smoke has made Nima tire easily and she has complained of chest pains, headaches and eye irritation.

Sonam on the other hand could not understand why his wife complained about her pains and aches. And he paid little attention to his wife's deteriorating health. *"I talked to my friend, Bhume Lama, about my problems. Bhume also happens to be a smoke hood manufacturer trained by Practical Action. After listening to my problems he suggested we install a smoke hood,"* he says.

Sonam talked to his wife about the benefits of smoke hood and agreed to install one, but the cost of installation would amount to NRs.5,000 (nearly £40). *"I had to install a hood for the safety of my family,"* he says. *"I made a NRs1,000 down payment and obtained NRs.4,000 on loan from the village revolving fund. I now pay NRs. 150 per month to the revolving fund to cover the loan."*

After the installation of the smoke hood Nima says she immediately felt the difference. Her eyes no longer watered and she no longer suffered headaches and chest pains. She also spends more time outdoors because the improved combustion has meant her cooking time has decreased significantly.

Sonam recently formed a group of 20 HHs to share his knowledge and experiences. All the members from Sonam's group have installed smoke hoods in their homes. *"People now come to me seeking for information on indoor air pollution and smoke hoods. I am happy to share my knowledge and experience with them."*

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### **CASE STUDY 6      *Chepangs* use of technical enquiries services, Nepal**

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Agro Herbal Products is a community-based enterprise based in Chitwan district. They approached Practical Answers at a time when their focus was on the basic processing and marketing of non-timber forest products and agricultural goods. Starting off with simple methods of drying and steaming herbs and other products, they found demand was so strong, they needed to secure a greater supply of herbs and more efficient processing technologies. It was with this in mind that the enterprise approached Practical Answers for information and suggestions.

The Practical Answers Technical Enquiries Service made recommendations for the installation of a glass house dryer with information on the dimensions, materials and temperature controls needed for drying 15 different medicinal and aromatic herbs. Agro Herbal Products then constructed a 14'x 26' glass house dryer with a fiber roof and glass walls. Recommendations for the installation of a steaming unit for killing micro organisms at 80°C were also followed.

Following installation of the glass house dryer and steaming unit the productivity of the enterprise grew. The average increase in product value was 50%, and the profitability rose by nearly 20%. This led to greater demands for herb supplies. Agro Herbal Products began to mobilize individual herb collectors into a cooperative. The cooperative managed herb collections, agreed collection rates and undertook basic quality controls on the herbs before supplying Agro Herbal Products.

Members of the cooperative included 250 *Chepang* households from four Village Development Committees (VDCs). *Chepangs* are one of the most disadvantaged indigenous communities in Nepal. 60% of the household heads were women in search of some cash income to supplement their farming and labouring activities. In addition to direct returns for their herb collections, 10% of the gain in profits accrued by Agro Herbal Products were given to the cooperative.

There are examples of changes in the life styles of community members. Many now own a radio. Some have bought an ox for ploughing. Others have saved money to pay the school fees of their children and expend during festivals, and the same technical information has been used by an Agro Herbal Products cooperative in Surkhet district.

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### **CASE STUDY 7      Khodeza Begum on making vermi-compost, Bangladesh**

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Khodeza Begum (45) lives at a village named Mamudpur in Faridpur district of Bangladesh. She has two sons and two daughters. Her husband works as a seasonal chainman in the government's settlements office. They have a small plot of land by the house where they have been cultivating vegetables for some years, but despite using chemical fertilizers Khodeza found the land had become less fertile and productive.

Because the small patch of land is the major resource in Khodeza's family, lower production meant less food to go round. For a while Khodeza could not see a way out. Until in 2004 she visited an Agriculture Fair in Faridpur. Practical Answers had a stall there and Khodeza collected a leaflet on "vermi-compost making" from the stall. The leaflet made her enthusiastic to make her land fertile again.

As Khodeza was member of a local NGO (Rural Wealth Development Agency), she went to them first. They put her in touch with Practical Action's Faridpur office where the staff gave her more ideas about vermi-compost making options. In October 2004, Khodeza made a first vermi-compost bed at her house. Now she produces 40 to 50 KGs of fertilizer every 25 days. Of this, she uses some for her own land and sells the rest at the local market. Last winter she earned Tk 25,000 (about £225) selling vermi-compost fertilizer. Khodeza claims her land has started to regain some of the lost fertility and is again yielding more vegetables.



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### CASE STUDY 8      Artisan apprentices, Peru

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It is six years since 36 year-old Giannina Villavicencio started making desserts. Ranging from her specialty 'chocotejas' to pies with fillings she supplies and surprises regular clients every week. Giannina used to devote her time to her household, her children and a stall in the market where she sold clothing. Nobody thought that she would become one of the most sought-after bakers in Parcona.

Maria Elena Carhuayo is a 55 year-old woman with a fixed stall in the district market. Until seven years ago, she would sell sweets and cakes, but without much success. After trying out some different ideas, she decided five years ago to change her line of business and began making and selling chocolates.

Oriede Cigua is 67 years of age. Although she feels fit, she decided to retire from heavy work ten years ago to devote herself to her home. However, three years ago she realized that it did not take a great deal of physical effort to earn a good income. Now she specializes in making natural yoghurt and sweet fruit wines.

Parcota is the second most populated district in Ica with 70 thousand inhabitants. The ideas Giannina, Maria Elena and Oriede all followed came from a range of food processing workshops provided by the Women's Association of Parcona. The Association uses a training approach introduced to them by Practical Action in 1999 which is now obtains ideas, materials and support from the Practical Answers programme. Since 1999 over a thousand housewives have joined the Association and gone on set up their own small enterprises.

Some say Giannina is the most successful woman in the group. Her energy is inspiring. As soon as she learnt to make the local sweets known as 'tejas' and 'chocotejas', she began looking for ways to enhance them, adding new ingredients and flavours. *"I always keep up to date with the latest fillings and try out each preparation to obtain a good product"*, she says. Giannina now earns 100% more than she invests. *"This has helped my financial situation considerably. When I first began making chocolates, I asked a friend if she could sell them for me at work. Now never a week goes by without me receiving orders"*, she added. *"Maybe this is because I always make an extra batch to ensure the quality of the products before I sell them. That gives me the confidence that people will come back for more"*, she says.

At Christmas Giannina works extra long hours taking orders for chocolates in gift packages with various designs. *"I never thought I'd be able to enjoy and feel relaxed about my own business"*, she confesses. *"I even had a friend from Italy*

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*visit me a short while ago and he was delighted with my blancmange. Maybe I'll someday go international", she laughs.*

Maria Elena has been making chocolates for the past five years and could not be happier. *"I make the difference in the market, I always try to make my clients look for me and find something tastier", she confessed.* According to Maria Elena, she earns twice what she did with the sweets she used to make. *"I can sell my chocolates for 3 Soles each and they sell well", she says.* *"At the workshop we were taught how to price our goods and get the most value from our handiwork", she adds.*

Oriede Cigua is one of the oldest participants in the Women's Association of Parcona workshops. Oriede enjoys the three hours learning but she's most interested in earning more money. *"I have concentrated on making yoghurt and sweet fruit wine", she explained.* *"As my products are natural and fresh, people know I cannot charge the same as a product in a plastic container and they pay more", she said.* *"If shop yoghurt normally costs 2 Soles, I can charge 4," she says.* *"I make double on both my yoghurt and my sweet fruit wine, regardless of my age. I can even help my family".*

The women's next goal is to set up, *" as an independent centre in Ica specializing in confectionaries", they say.* But they are afraid this may take a long time. *"Our idea - Dulce Ica - will need refrigerators, kitchen stoves and chocolate pans to get going", says Giannina.* *"But we'll get them eventually and even now we have knowledge to pass on from generation to generation".*

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### **CASE STUDY 9      Improving the environment and making money: the case of Mazingira Fortified Fertilizer, Kenya**

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Mazingira is a fortified soil enriching fertilizer made from composted plant and animal waste. It is manufactured by the NAWACOM Cooperative Society in Nakuru town. The production of Mazingira Organic Fertilizer has created jobs for the waste collectors and other society Members who are pleased not only to obtain some income but to also to clean up the environment.



Mazingira production uses waste and mineral fortification to improve the overall soil fertility. Its quality is analysed at every stage in the production process; during inspection, analysis of raw materials, composting, fortification and as a final product. The production yields a fine fortified organic based fertilizer with high levels of nitrogen (N) and phosphorus (P) that are released slowly for plant uptake. As a result not only is plant mineral uptake improved, but also the soil structure and soil water retention capacities are improved, and pH levels buffered through the addition of organic matter.

#### **Impact Story**

At the beginning of 2008, Kenya had just gone through national elections and a tumultuous post-election period. Many families had been displaced and the country feared a hunger period owing to displacement from its grain regions.

When the planting season came, the cost of fertilizer was high because most of the trading companies had made major losses as a result of market disruptions and high rates of inflation, especially on imported goods. Fertilizer typically sold at between KShs3500/= and KShs5000/= according to availability. Currently it is retailing at KShs



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4000/=. The farmers who had trickled back to their farms were unable to afford it during the planting season and so were afraid that even then the production levels would be constrained.

It was at this time that Practical Action's work to improve the urban environment of informal settlements began to train and organise different groups of waste managers and environmental conservationists on ideas for adding value to waste byproducts and their manufacture.

One of the groups that received training and support was *Nakuru Waste Collectors and Recyclers Management* - NAWACOM – a local Investment Cooperative. NAWACOM is an umbrella organisation that has brought together over 500 different waste collector and recycler groups and individuals. These are now the manufacturers of Mazingira fertilizer.

In introducing the home-made fertilizer at the end of 2007, most of those who bought the product were skeptical. Most had been sparing in their use of conventional fertilizer because of high costs and felt forced to try out something new. Seven villages were targeted by initial product promotions - Mau Narok, Bahati, Karonga, Kabazi, Mwariki, Lanet - because they were expecting a collapse by as much as 60% of normal sales.

In one farm in Bahati, Baba Nganga, a mid sized farmer, began his routine planting of 20 acres of maize. The limited availability of conventional fertilizer meant he could not dress all his fields and he initially decided to plant only half his acreage until more fertilizer became available. A month later, disappointed with the lack of supplies and fearing he'd lose the growing season, Baba Nganga decided to try out Mazingira. Six months later, his skepticism disappeared. The difference was clear.

Contrary to the normal cropping season where the first plantings yield highest, Baba Nganga found his earlier 'conventional' planting had grown maize with no husks. The plants were short and nutrient depleted. By comparison the plants sown a month later were healthy and strong with four mature husks of maize on each plant.

*"I shan't use anything else in the coming planting season," says the former skeptic. "After seeing the difference I'm also going to use Mazingira on my oranges, beetroots and beans," he says. "All my plants are growing faster than normal." Baba Nganga is convinced that "organic farming is the solution for farmers today. Mazingira did it for me and I feel born again."*

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### **CASE STUDY 10     How a propeller turbine design from Peru ended up in Pakistan**

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Back in December 2005 Mr Shabab Wahid was an engineer working in northern Pakistan designing and developing mini and micro level hydropower schemes. Mr Shabab wrote to Practical Answers with a problem. He had been looking at the design of a low-head micro-hydro axial turbine designed for local manufacture at low cost that had been developed by the Practical Action office in Peru.

While the design had been successful and was available on the internet Mr Wahid's difficulty was all the useful documentation was in Spanish including the *Guia de Fabrication*. So, while he had already made good progress from the engineering drawings he obtained on-line there were a few details troubling him.

Mr. Wahid wrote, *"I have downloaded the drawings, summary and the assembly guide from your website. But one file regarding the machining and manufacture of turbine components - especially the runner blades - is not available. Could you please let me know the how to make the runner and its vanes? Fabrication of the other components is easy, but I am stuck on the runner. The drawings are not sufficient for someone needing to make one from scratch"*.

Through the Technical Enquiries Service Practical Action was able to translate the construction manual into English which allowed Mr. Wahid to complete the manufacture and installation of a 37 kilowatt turbine. Mr. Shabab Wahid writes, *"the services provided by your group were very helpful. The information provided by you was extremely helpful and approximately fifty households (400 people) have benefited from the information you provided. Please continue this service. I am currently looking to improve our casting facilities to make more blades."*



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### **CASE STUDY 11     Uptake of Micro-Hydro in Papua New Guinea**

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The following email exchange provides one view of how the Technical Enquiries Services are available to development practitioners worldwide:

**Sent:**                    29 November

Dear Sir,

We are about to implement a 50kW micro hydro project in our country, Papua New Guinea. It is for Tapini Intergrated development and the Berina Catholic Church Station. This project is funded by Australian Aid. Could you help to supply us with the ELECTRICAL GUIDELINES FOR MICRO HYDRO INSTALLATIONS. This would greatly assist us in implementing the project.

Yours for Micro Hydro, JDar

**Sent:**                    2 December

Dear Joseph,

In 1991 ITDG produced a document called Electrical Guidelines for Micro-Hydro Electric Installations which was aimed at providing minimum standards for micro hydro electrical installations in Nepal that would guarantee reliability of an accountable level without unduly increasing costs. The work was carried out between ITDG and the Agricultural Development Bank of Nepal.

I will send a copy by post. Cheers, Neil

**Sent:**                    5 January

Dear Neil,

Happy and prosperous New Year. I with heart thank you for your assistance in getting the Electrical guidelines for the Micro Hydro installations across. I have received it here. Your help is a contribution to the development and extension of the micro hydro power technology and a direct injection of knowledge to the moulding of a rural power young mind.

Thanks and hope to keep in contact for further harnessing of rural power technology for the prosperity of mankind. Cheers, Joseph Dar Mulom.