

## March 2013 About this project

### Name

Bridging Knowledge Systems for Pro-Poor Management of Ecosystem Services.

### Principal investigator

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### Partners

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### Time frame

December 2010 – May 2013.

### Objective

To develop methods which help to narrow the gap between scientific and traditional knowledge. This will lead to more effective adaptation of small scale farming systems, and ultimately more sustainable management of ecosystem services.

### Summary

This project focused on efforts to turn a local 'wild' plant species into a new agricultural crop, as it provided an excellent opportunity to study how traditional ecological knowledge and scientific knowledge interact and supplement each other. *Jatropha curcas* is an 'underutilised species' – a useful plant already known to farmers, but not as a cash crop – surrounded by ecological and economic controversy. Following the collapse of the hype around *Jatropha* as a sustainable biofuel crop, various different end-uses of *Jatropha* trees have been explored. This project uncovered what helps and what hinders the adoption and spread of activities such as local oil extraction and soap making. Locally produced *Jatropha* soap had a positive impact on household expenditure and bridged gaps in soap availability, thus providing important health benefits. Additionally, citizen science approaches discovered new uses for *Jatropha* as a pesticide.



# All washed up?

**Combining traditional and scientific knowledge is allowing villages to profit from a failed biofuel**

Who knows better: the distant scientist or the local farmer?

People have been struggling with that thorny question ever since the Green Revolution. There are plenty of examples where traditional knowledge has been exploited by – and then treated as inferior to – scientific (or 'global') knowledge. Yet reliance on scientific knowledge alone has often been a key reason why top-down aid programmes have struggled to deliver sustainable rural development in the global south.

This ESPA-funded project set out to develop and test methods which could help to narrow the gap between scientific knowledge and traditional knowledge so that the two together can help adapt small scale farming systems towards the more sustainable management of the environment.

Working in Zambia, it looked at efforts to commercialise *Jatropha*, a common, naturalised shrub found across much

of Africa. This 'underutilised species' is already well known to farmers, but not as a cash crop. However, thanks to the recent rush for biofuels, it has now become surrounded by ecological and economic controversy.

### Miracle fuel

Commonly planted along the edges of properties, in recent years *Jatropha* has been extensively promoted as a cash crop in the field. Before then, the tree had mostly been valued for its shade, its use as wind break, and for its attractive flowers. With the coming of outside investment, the emphasis shifted to producing oil seeds for sale.

This also represented a shift in knowledge on how to manage the tree; abandoning traditional practices (such as planting shoots coppiced from existing trees), in favour of 'modern' agronomic practices brought in by (mainly) western investors who have set up out-growers schemes in Zambia.

This case study illustrates the critical importance of good research, built on knowledge exchange between farmers and scientists. Competing claims of invasiveness, impacts on soil fertility and human health created controversy and confusion, whilst a demand-led quest for the holy grail of sustainable biofuels and casual observations of how well *Jatropha* grows in villages, fuelled a rush to invest.

The arrival of western companies on their doorsteps persuaded many local farmers to ignore local knowledge of *Jatropha* and try it out as a cash crop in the field. However, it turned out that as a productive field crop, *Jatropha* needs similar inputs as existing crops which fetch much higher market prices. This forced companies to learn more about local conditions and farming systems and to shift towards more locally embedded practices such as live fences and intercropping.

This costly learning curve and the continued difficulty to achieve economies of scale led to the collapse of outside investments, and farmers who had *Jatropha* trees, were left with a lot of seeds without a market.

### Rediscovery

Following these recent events, this project looked at different end-uses of *Jatropha* trees, and the processes of knowledge production and circulation associated with these. For example, why and how did traditional uses of *Jatropha* – such as a medicine or for lighting – decline?

Recording their traditional ways of using *Jatropha* rekindled an interest in soap production for farmers in the Eastern Province village of Sikwenda. After being trained in soap making, they formed their own cooperative - Kasike - and have been producing soap now for almost two years. Using the oil for soap making fetches them up to three times what selling it for biodiesel would. They have also trained other communities, and their soap making activities have attracted attention from NGOs like World Vision, and government officials, who are supporting further training of other communities.

*Jatropha* soap production has been very popular amongst the villagers, not only does it make soap more affordable it has also contributed to better hygienic practices that have improved general health standards in the villages and reduced cases of skin disease and diarrhoea.

At the same time that the project embarked on this action based research of soap making, they also continued with the core programme of the project and worked together with a group of farmers in Zambia's Central Province on recording traditional knowledge systems in farming management practices, such as pest control.

Through these experiments, those farmers have created a knowledge database about the use of biological pesticides, including *Jatropha*. Through a bottom up experiment of a village lab, a physical space was created in the village where local farmers and scientists could experiment together and where knowledge was shared between the two groups. Together they have developed an expert knowledge system about *Jatropha* leaves as a biological pesticide against maize stem borers.

### Next steps

The project team are working with local and international NGOs to replicate and scale up the soap making activities. The farmers in the Central province have been trained by the Kasike farmers how to make soap and as a result the soap making project is now replicated in the Central Province. Conversely, a workshop will be organised to train the Kasike farmers in the benefits of biological pest control and they will also be introduced to the principle of the village lab.

The latter has become a place where knowledge is generated and shared about best practice farming systems and has attracted a lot of attention from other farmers in surrounding villages who come for consultations and identification of new pests in their fields. Farmers are organising their own training workshops and have developed the idea to write a training manual on how to set up scientific experiments in the fields to further test the idea of harnessing underutilised species in the farming landscape.



### New knowledge

- Action research and citizen science has uncovered viable uses for *Jatropha* that are more promising than biodiesel production such as soap from *Jatropha* oil and the use of *Jatropha* leaves for biological pest control.
- By using local innovations and building upon local knowledge, farmers discovered and developed ecosystem services from underutilised species. Some of the benefits of these underutilised species had a direct impact on improving farmers' livelihoods.
- Harnessing local ecological knowledge and empowering farmers stimulated low tech innovations that contributed to pathways out of poverty.

### Creating impact

- Using the underutilised plants in a village for soap production is contributing to direct health improvements, whilst usage as a pesticide is increasing yields. Both are leading to financial savings for farmers.
- Farmers have gained a better understanding of how setting up experiments in a systematic way can facilitate a learning process that can help them find solutions to some of their challenges.
- Through the on-going action research in two communities, surrounding communities are also experimenting with soap making and the concept of the village lab. Farmers are engaging with peer to peer training as well as NGOs looking to implement the soap project on a wider level. The agricultural extension officers who have seen the science in action in the village lab are exploring the opportunities this might create for other communities.

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