

ProBEC – Programme for Biomass Energy Conservation

Impact Assessment at Local Level

Experiences from Malawi – Mulanje District



Summary

Income generation through stove production, health improvements through reduced amount of smoke, recognition and strengthening of private household activities and of course decreased pressure on fuel wood sources – Biomass Energy Conservation (BEC) is not only improving our environment, moreover it has economic and social implication, in particular for families in the rural areas of so-called developing countries.

Since 1998, the SADC Programme for Biomass Energy Conservation (ProBEC) is spreading improved cooking technologies for the efficient and sustainable use of biomass energy. Several types of improved stoves are applied in Southern African countries. In Malawi, the clay- and ceramic stoves are introduced through the Integrated Food Security Programme (IFSP), targeting small-scale industry and private households – in particular women.

In order to analyse changes achieved through energy saving stoves, to distil lessons learnt and recommendations for further implementation of BEC methods, an extensive qualitative impact assessment was carried out in Malawi. Four villages in Mulanje district in Malawi were assessed from July to September 2004, involving the traditional leadership, stove promoters, producers, stove-users and non-users.

Those households, which experienced this technology – 29% are currently using stoves – shared the impacts of improved stoves.

While saving firewood up to 50%, those families spend only 50-70 MK instead of 100-150 MK weekly on wood. Selling stoves for 120 MK each (comparing: compulsory day-labourer rate of 60-120 MK), stove producers reported to have an income of up to 1,300 MK per month. Through reduced smoke and increased hygiene, the women experienced less respiratory diseases and cleaner food. Gender relations in the villages started modifying. Women are improving their social position and role in families and villages; men start to be concerned about household issues. Reduced amounts of firewood required, saved forests, better water control and less soil erosion and degradation are improving the rural environment. Environmental changes are discussed among villagers.

Nevertheless to increase the adoption and to improve the further implementation, it still requires the consideration and work on the following factors.

- Education and knowledge within the village & Awareness about general resource (wood) availability & Time required for internalisation of changes
- Involvement and support of traditional leadership – male or female chief, Ndunas and Village Development Committee
- Skills, know-how and motivation of promoters and producers
- Quality of stoves – clay source, clay storage and preparation, technology transfer and proper kiln firing & Acceptance of stoves and estimation of their value
- Frequency and regularity of (exposure) visits and training & Involvement of stove promoters and producers as trainers

This impact assessment not only provided information about stove adoption, impacts and challenges, it also gives indication for further modification to improve the implementation of energy saving stoves and BEC technologies.

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Abbreviations

ADC	Area Development Committee
BEC	Biomass Energy Conservation
BMZ	Federal Ministry for Economic Cooperation and Development
CADC	Catchments Area Development Committee
EO	Extension Officer
EU	European Union
FWD	Foundation for Woodstove Dissemination
GTZ	German Development Cooperation
GV	Group Village
GVDC	Group Village Development Committee
GVH	Group Village Headman/Headwoman
HEDON	Household Energy Development Organisations Network
HEP	Household Energy Programme
IFSP	Integrated Food Security Programme
ITDG	Intermediate Technology Development Group
MK	Malawi Kwacha
MP	Member of Parliament
ProBEC	Programme for Biomass Energy Conservation
SADC	Southern African Development Community
SSI	Semi-structured interviews
TA	Traditional Authority
UNDP	United Nations Development Programme
vb	Verena Brinkmann
VDC	Village Development Committee
VNRMC	Village Natural Resource Management Committee

1 Introduction

In many so-called developing countries, biomass is still the main energy source, and in particular the approximately two billion people living in rural and peri-urban areas are highly dependent on biomass energy to meet their daily needs. This concerns especially private households and small-scale industry. But fuel wood is becoming scarce. The women, who are usually responsible for cooking, baking, heating and thus for the provision of fuel, are particularly exposed to the shortage of biomass energy.

To improve the living conditions of households and the efficiency of small-scale industries, the Programme for Biomass Energy Conservation (ProBEC) is introducing improved cooking technologies for the efficient and sustainable use of biomass energy. This programme is implemented in 8 countries of the Southern African Development Community (SADC) Lesotho, Zimbabwe, Mozambique, Namibia, South Africa, Tanzania, Zambia and Malawi. According to cooking habits and resource availability, different types of stoves were developed in the different countries.

In Southern Malawi – Mulanje district – Biomass Energy Conservation (BEC) is implemented through the Integrated Food Security Programme (IFSP). In Mulanje district, where local types of stoves already existed before, two new types of stove were developed and further improved since 1999: the portable clay stove “Chitetezo Mbaula” and the fixed mud stove. These stoves are made out of locally found material and used in private households in the rural area of Mulanje.

This impact survey – carried out in July to September 2004 – was supposed to analyse changes, which are due to BEC efforts in Mulanje district. Besides existing IFSP documentation of training achievements, implementation and experiences with energy saving stoves, it was considered important to identify BEC impact through a detailed, qualitative field study by an external assessor.

This survey covered the assessment of the following:

- Adoption of energy saving stoves – motivation and barriers to the use of stoves
- Impact achieved at local level in Mulanje district
- Lessons learnt – challenges and critical points concerning stoves

A ProBEC impact questionnaire preceded the field visits in Mulanje district. It was distributed to stove promoters and producers from five ProBEC countries plus Kenya, to provide a first impression about stove-users’ experiences. Considering this feedback and further IFSP information, four villages were selected, visited and assessed. Interviews, group discussions and observations provided a wide range of qualitative data – analysed and compiled in this report. As statistics were not systematically and reliably recorded in Mulanje district, the IFSP project had difficulties setting up a quantitative database. Thus qualitative interpretations in this report are supported by quantitative data, where available.

Finally the present report documents the background of BEC in Mulanje District, Malawi and the methodological approach applied for this impact assessment. The assessment outcomes concerning stove adoption, impacts and lessons learnt are combined with the results of the ProBEC questionnaire (referring to Mulanje district) as reference data. The conclusions and recommendations are finalising the discussion about impacts and sketching a way forward for BEC in Malawi.

This report provides a general knowledge base about ProBEC related activities at the local level. At the same time specific information about BEC in four selected villages in Malawi, based on experiences of stove producers, stove promoters and stove-users, is documented in the annex.

2 Background of BEC in Mulanje District, Malawi

Many people depend on biomass energy as fuel and at the same time it is becoming an increasingly scarce natural resource. Considering this, conservation of biomass energy is an important component of the IFSP approach in Malawi, Mulanje district. The energy saving stove, promoted in this area, is an innovation of ProBEC. The following section describes the connection between biomass energy, ProBEC and IFSP in the respective impact area of Mulanje district.

2.1 Biomass Energy

Biomass energy covers wood fuel, charcoal, agricultural and forest residues or other plant matter. Around two billion people in developing countries, living in rural or peri-urban areas, depend on biomass energy for their daily needs. This especially concerns small-scale production, private households and their women, who are generally not only responsible for cooking, but also for the fuel supply. It is estimated that in sub-Saharan African countries 70 to 90% of all primary energy is fuel wood used for cooking. Between 20 to 30% of total biomass energy goes into the small-scale productive sector¹.

The latest developments show, that biomass energy will of necessity (not of choice) remain the most widely used fuel in the near to medium term. Alternative energy sources such as gas or electricity do not reach the low-income and especially the rural population; they are neither available nor affordable. But fuel-wood is becoming more scarce, in terms of degradation of forests and deforestation, due to industrial, agricultural and private overuse of wood. Therefore efforts are concentrating on conservation of biomass energy. Efficient technologies have been developed, adapted and tested. Appropriate dissemination concepts, strategic and methodological approaches and organisational set-ups were identified and initial assessments were carried out. These showed that it was possible to achieve considerable improvements in energy savings (at least 50%) at individual household level and up to 70 to 80% at small business level. But the real challenge is to reach economies of scale, in order to make the technologies accessible to the majority of the poorer sectors of society².

During the last 20 years, the German Development Cooperation (GTZ) has been supporting more than 20 national projects and regional programmes with the efficient and sustainable use of biomass energy for households and small businesses. Most of these projects have been carried out in Africa.

2.2 Programme for Biomass Energy Conservation (ProBEC)

The Programme for Biomass Energy Conservation in Southern Africa (ProBEC)³ is a SADC programme and currently active in the eight illustrated SADC countries. ProBEC has been implemented by GTZ since 1998.

The vision of ProBEC is to enable all populations, especially “lower income groups” (to) “satisfy their energy requirements in a socially and environmentally sustainable manner”⁴. Technology and knowledge about biomass energy conservation shall empower and enable especially vulnerable groups to improve their living standard.



Fig.: ProBEC affiliated countries

¹ Compare GTZ 2004 or <http://www.gtz.de/energie>.

² Compare GTZ 1997 or <http://www2.gtz.de/hep/english/index.html>.

³ Compare <http://www.probec.org>.

⁴ <http://www.probec.org/goto.php/probec/index.htm>

“Biomass Energy Conservation refers to

- use of more energy efficient technologies (energy saving stoves),
- use of alternative renewable sources (e.g. solar, green fuels),
- introduction of more efficient firewood management (drying wood, splitting wood etc),
- improved kitchen management (e.g. reduced time for cooking processes, better ventilation at the cooking place) and
- sustainable natural resource management.”⁵

2.3 Challenges in Malawi & Mulanje District

With a population of over 10 million and a land area of 94,000 square kilometres, Malawi is one of the most densely populated countries in Sub-Saharan Africa. Malawi is one of the world's poorest countries, where about 90% of the population is living in rural areas, depending on small-scale farming for their livelihood and on traditional fuels – particularly firewood and charcoal – accounting for 89% (1997) of the country's total energy use⁶.

Biomass energy contributes over 95% of Malawi's primary energy supply and over 90% of total energy demand. The high population density, extreme poverty and low efficiency put great pressure on the environment for more farmland and fuel wood. At about 2.4%, Malawi has one of the highest annual deforestation rates in Africa and fuel wood is becoming scarce⁷.

Mulanje district is one of the most densely populated rural districts (250p/km²) in Malawi. A small average land holding size (app. 0.4ha), seasonal patterns and high variability of rainfall and soil degradation result in low agricultural productivity. Thus Mulanje district is suffering from chronic food shortages. A further problem Mulanje's villagers are facing is the high disease pressure (esp. HIV/Aids). To cope with these circumstances the villages depend on assistance and aid from outside – district, national or international level – and they are not self-sustaining⁸.

Mulanje district⁹ is divided into six Traditional Authorities (TA), which are subdivided into Group Villages (GV) and then villages. On top of the village hierarchy is the village headman/headwoman (chief or “Afumu”), responsible for all decisions, with the support of his/her assisting bodies: the vice chief (“Nduna”), the councillor (political representative of the Member of Parliament (MP)) and the village development committee



Fig.: Map of Malawi

⁵ ProBEC n.d., p.1.

⁶ Compare <http://www.probec.org/goto.php/countries/co.MW/index.htm>. Further information about the country, compare http://www.wfp.org/country_brief/projects/101060.pdf

⁷ Compare <http://www.probec.org/goto.php/countries/co.MW/index.htm>.

⁸ Information compiled from different IFSP presentations.

⁹ For further geographical information compare http://www.nso.malawi.net/data_on_line/general/Atlas/Atlas_pdf/atlas_c_introduction_lowres.pdf.

(VDC¹⁰). The chief obtains the position through heritage within his/her family. There are male and female chiefs in Mulanje district as well as male and female GV heads and TAs. The Nduna is appointed and the VDC members are elected by the villagers. The VDC is the central committee in a village, assisting the chief and the Nduna in village development issues. It has to report to the next higher institutions, the group village development committee (GVDC) and TAs, as presented in the following figure.

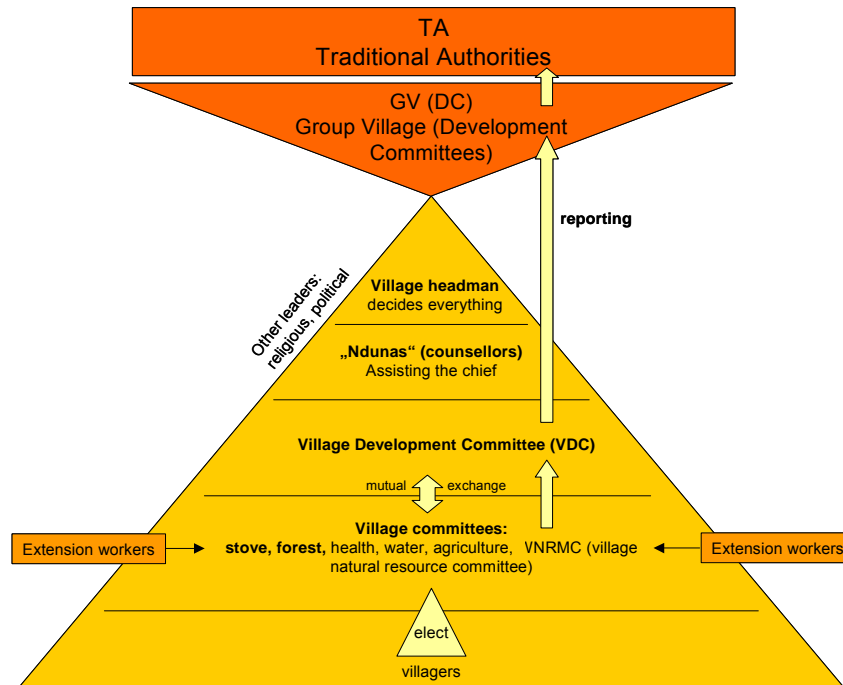


Fig.: Village set-up and power hierarchy in Mulanje district

According to traditions, land within the villages is owned by the chiefs, but distributed to the families to cultivate and use it already decades ago¹¹. Therefore forests on communal land are owned by the chief and the use of fuel wood has to be permitted by him/her. Else the major firewood source within the district was and still is Mulanje Mountain.

The social structure is determined by the practiced matrilineal system – as opposed to the North of Malawi, where a patrilinear system is common. This means that the village is structured along the maternal side of the family. The women stay at the places where they were born, on their parents' compounds, whereas the men have to move. In maternal societies, however it is not the woman, but a maternal uncle or another male relative, who makes decisions and has many responsibilities in the village.

2.4 Integrated Food Security Programme (IFSP)

The Integrated Food Security Programme (IFSP), a GTZ and EU project, is based in and focuses on Mulanje district in Malawi. IFSP started in 1996 under German funding

¹⁰ The VDC is responsible for the village development and for the support of other committees according to their request. Within its main function to contribute to poverty alleviation, it is growing and multiplying seeds and coordinating plantation and harvest within the village.

¹¹ Nowadays, new villagers still have to ask the chief for permission to settle and to cultivate a piece of land. The land stays in the hands of the family for generations and it is not taken away until something unforeseen happens.

(until September 2003)¹². Thereafter the EU funded an extension of 12 months (until 3rd September 2004). Concepts were developed to obtain an improved and sustainable utilization of the available resources, to contribute to food security and poverty reduction.¹³

The objective of IFSP was an improved or at least stabilized food security. The expected benefits were on one hand more food per person, meaning improved availability and accessibility (more food from own production and through markets and transfers) and on the other hand an improved utilization of food, through less disease pressure and better food preparation. These IFSP areas of intervention were as follows.

- agriculture
- family planning
- income generation
- food-for-work (to overcome acute food gaps)
- health (including HIV/Aids)
- water
- food preparation

According to experiences of the project, it is recommended to take the following crosscutting issues into consideration, when dealing with the intervention areas.

- village planning and decentralization
- capacity to plan and implement (food security measures)
- village security management system (community policing)
- gender equality
- HIV/Aids mainstreaming

One of the intervention areas is food preparation. According to tradition, this mainly addresses women, who were therefore especially targeted by the project. They were supported in preparation, processing and preservation of food by improved

- **methods** for processing, preservation and storage of food,
- **recipes** (diversification of crops, diversification of food),
- **energy saving stoves** and reforestation on private land (joint EU/IFSP and ProBEC project) and
- **household management** techniques.

The energy saving stove promoted by ProBEC is one component within the IFSP approach. Different variations of stoves are used in Malawi¹⁴:

1. Chitetezo Mbaula (in short Mbaula) – the protecting stove: portable clay stove for rural households. It saves firewood up to about 60% compared to the traditional 3-stone fire (Mafua)¹⁵ and is the best low-cost option for rural areas.
2. Fixed mud-stove – suitable as an alternative to the portable clay stove. It can be used for bigger pots and larger families and in areas where clay is not suitable for firing. It also is a means to recycle a broken Mbaula, else it can be entirely build out of mud.



Photo (vb): Mbaula



Photo (vb): Fixed stove

¹² Compare <http://www.gtz.de/crisisprevention/download/malawi.pdf>.

¹³ The following description is based on different IFSP presentations.

¹⁴ For more information about these stoves, compare the Household Energy Development Organisations Network HEDON, <http://www.hedon.info/goto.php/ImprovedCookstovesInMalawi>

¹⁵ According to IFSP cooking demonstrations – meaning under perfect conditions – experiments proved that the Mbaula could save up to 60% of firewood compared with the Mafua.

3. Fireless cooker or food-warmer – is promoted as addition. It retains heat through a thick insulation layer made out of local materials like dry banana leaves¹⁶. Food is brought to the boil on a stove, and then transferred directly to the fireless cooker, where it continues cooking slowly.
4. Rocket stove – new invention, used for large scale catering mainly. In the L-shaped combustion chamber, surrounded by insulative bricks, the combustion can be optimised and the amount of firewood reduced.



Photo (vb): Food-warmer



Photo (vb): Rocket stove

The main fuel for all types of stoves is firewood, besides leaves, twigs, grass and maize stalks. Most of the fuel is collected, seldom bought. The fuel shortage is already affecting certain areas, especially those that are further from Mount Mulanje.

The IFSP project area covers three of the six TAs (TA Nthiramanja, TA Nkanda, TA Juma), 185 villages within 20 GV and app. 50,000 households. The overall IFSP-food security concept is characterized by the following principles.

- Integration of complementary components
- Direct connection to local/village level and empowerment of local people
- Extensive participation
- Training and involvement of extension systems
- Decentralized and demand-driven service delivery

According to the **extension approach**, IFSP selected and trained agricultural field advisors (extension officers, EOs) in different areas – among others in forestry, household management and stove implementation. Each EO is responsible for a number of villages within the three TAs, where he/she requested traditional authorities to organise village meetings and to select stove and household management promoters. Following this process 924 promoters were selected in the IFSP villages and trained in several workshops – 370 stove, 370 household management and 184 forestry promoters. These promoters regularly received advice and support from respective EO, after which they had to train other villagers, promoting the IFSP “intervention area” of food preparation.

The concept of stove promotion was modified during the project. In the phase from 1999 to July 2002 IFSP was funded by the Federal Ministry for Economic Cooperation and Development (BMZ) in the context of “Crisis Prevention”, excluding commercialisation. Thus stove promotion was carried out as **self-help approach** – everyone in the villages was targeted and trained to build a stove on his/her own. The selected promoters either organised public stove and cooking demonstrations for all villagers or supported single families to build fixed stoves at their homes. Training and support were free of charge for the villagers.

Since July 2002, under EU funding, the project shifted to a **commercialisation approach**. The stove producers were trained in kiln construction and firing, organised by ProBEC and implemented since September 2003. Stove promotion concentrated on commercial marketing of stoves by some experienced and professional stove producers. The overall idea was to sustain stove production and to make it a durable innovation, through shifting over to commercial production and creating a market for stoves. Producing for income generation required an ensured quality of stoves, thus these producers received additional training in quality control, firing, pricing and marketing of stoves.

¹⁶ Compare <http://www.probec.org/docs/Foodwarmer.pdf>.

Household management promotion deals with the preparation of food and the organisation of the kitchen. Concerning the cooking process, ingredients should be prepared before starting the fire and food should not be cooked too long. Certain vegetables, spices or herbs should increase the food variety. Recommended utensils in the kitchen besides the stoves are the food-warmer, shelves for cleaner plates, pots and ingredients, and a chair for more comfort. Household management also deals with the firewood preparation and storage for drying the wood.

Stove and household management promotion took – and still takes – place in combination. During these so-called **stove and cooking demonstrations**, the respective promoters invite all villagers – and even some neighbours – to a central place (chief's house e.g.) to build the portable Mbaula and to learn about firewood and food preparation and the use of the improved stoves. The stove promoters inform and train interested villagers about techniques and measurements. To finally prove the Mbaula's potential and to compare, the 3-stone fire and the improved stove are used at the same time and the villagers are able to witness the advantages of the improved stove themselves. Additionally the promotion of fixed mud stoves takes place at the respective homes of villagers. The promoter supports them with measurements and the people themselves do the main work, following her instructions.



Photo (vb): Ligomba – stove and cooking demonstration

For commercial production, the **kiln** for stove-firing was introduced. It is made out of bricks, anthill soil, gravel and sand, with twigs and grass for the roof¹⁷. To improve the roof it is recommended that plastic underneath the grass thatching be used. This kiln has a firing chamber (following the same principle as the stoves), which keeps the heat. The temperature is adjustable through increasing or decreasing the amount of firewood. It has capacity for around 100 stoves to be fired – depending on the size of the kiln. One advantage of the kiln is, it saves firewood to an extent of 50% of the amount used before¹⁸. Secondly it prevents stoves from cracking as the heat can be applied slowly and with regulation. During the former firing process in a pit, once the fire was burning it was not possible to adjust the fire and therefore the heat was partly too high for the stoves. With this innovation, quality stoves could be pro-



Photo (vb): Mkwaila – kiln firing

¹⁷ For the construction of kilns the IFSP project provides a manual, which explains step by step, how to proceed. Compare as well <http://www.hedon.info/goto.php/view/416/forum.htm>.

¹⁸ Before stoves were fired in a hole in the ground (pit) with firewood underneath and on top. As no quantitative and comparable data about the amount of firewood needed for the pit-firing was available, it is difficult to calculate the saved firewood. But according to experiences of the stove producer Mrs. Nanjiwa (Likalawe), about 50% of the previously needed firewood is used. This is corresponding with figures monitored in Kenya.

duced and thus those, who started larger production, were advised and tend to build a kiln – supported by experienced producers.

As a result of the previous approach, most of the stoves used in Mulanje district are self-made by the villagers, either after or during a training for Mbaulas or the fixed stoves with the support of the promoters. According to the ProBEC questionnaire, 75% of the interviewed households built the stoves themselves. Few bought a stove made by someone else and some received it for free as a present¹⁹.

¹⁹ Compare Brinkmann & Klingshirn 2005.

3 Methodology

This ProBEC Impact Assessment at local level was carried out in three steps. The first step was a questionnaire, providing general information about adoption and experiences with the energy saving stoves. The second and main step was a detailed assessment of changes within the impact area of Mulanje district. The third step was a follow-up visit to the respective villages to assess further activities and the impact of the assessment itself. Qualitative data was collected and analysed, following the social science methods of sampling, interviewing, observing and documenting²⁰ – partly including quantitative information, where available.

3.1 ProBEC Questionnaire

At the ProBEC workshop on “Experience Exchange on low-cost Clay and Ceramic Stoves”, held in Malawi (from 28th June to 7th July 2004)²¹, six countries – Malawi, Mozambique, Zimbabwe, Zambia, Tanzania and Kenya – were represented by their stove producers. In preparation of the workshop, the participants were given impact-questionnaires²² to assess the stove adoption and experiences of stove-users in their respective impact area. After exchanging with their clients, stove producers (except Mozambique) delivered 220 questionnaires. These were analysed and the results presented to the participants during the workshop.²³

These questionnaire results provided an overview over users’ experiences, different approaches and developments in the respective ProBEC countries in general and offered a first impression of stove implementation within Mulanje district in particular. The questionnaire results were taken into consideration for the design of the village impact assessment and the selection of the villages. For this report, the results were regarded as reference data, which could partly support the assessment results²⁴.

3.2 Impact Assessment at Local Level

This village assessment provided insight into BEC achievements and impact at targeted household level within Mulanje district. It was carried out in three phases from 23rd June to 18th September 2004: selection, field and evaluation phase²⁵.

During the **selection phase**²⁶ information about the villages was gathered through participation in the ProBEC-workshop on household stoves, exchange with project extension staff and documentations. Four villages out of 185 were identified and chosen according to the following 9 criteria. Distribution of the villages within the impact area, size of villages, village leadership, duration of participation within the IFSP project, adoption of stoves, commercial production, connection to a kiln, distance to a

²⁰ For the applied social science methods compare GTZ/HEP, ITDG & FWD 1996, pp. 46-53, as well as Schoenhuth & Kievelitz 1994.

²¹ Compare Tawha & Owala Odhiamdo 2004.

²² Compare Annex 1 Questionnaire for the Assessment of ProBEC Impact.

²³ For purpose, process and results of the questionnaire, compare Brinkmann & Klingshirn 2005.

²⁴ One of the major strengths of this questionnaire exercise was the involvement and empowerment of producers. At the same time the resulting weakness was their lacking know-how about impact assessments, as it was carried out in this participatory way for the first time. As there were some misunderstandings, the results were not always meaningful, but could be regarded as tendencies. The experiences the producers made, led to the demand for more involvement and training in impact assessment. Compare Brinkmann & Klingshirn 2005.

²⁵ For the design of impact assessments to monitor and evaluate household energy projects also compare GTZ/HEP, ITDG & FWD 1996.

²⁶ The selection took place from 23rd June to 18th July 2004.

trading centre and distance from the mountain were reflected for the selection of the four villages – Salamu, Ligomba, Njete and Matanya²⁷.

Relevant key persons were identified within the villages. Key informants for adoption, impacts and challenges of improved stoves (“stove-specific information”) were the stove-users, promoters and producers²⁸. The village leadership was addressed for “general village information and developments”. The assessment approach as presented in the following figure.

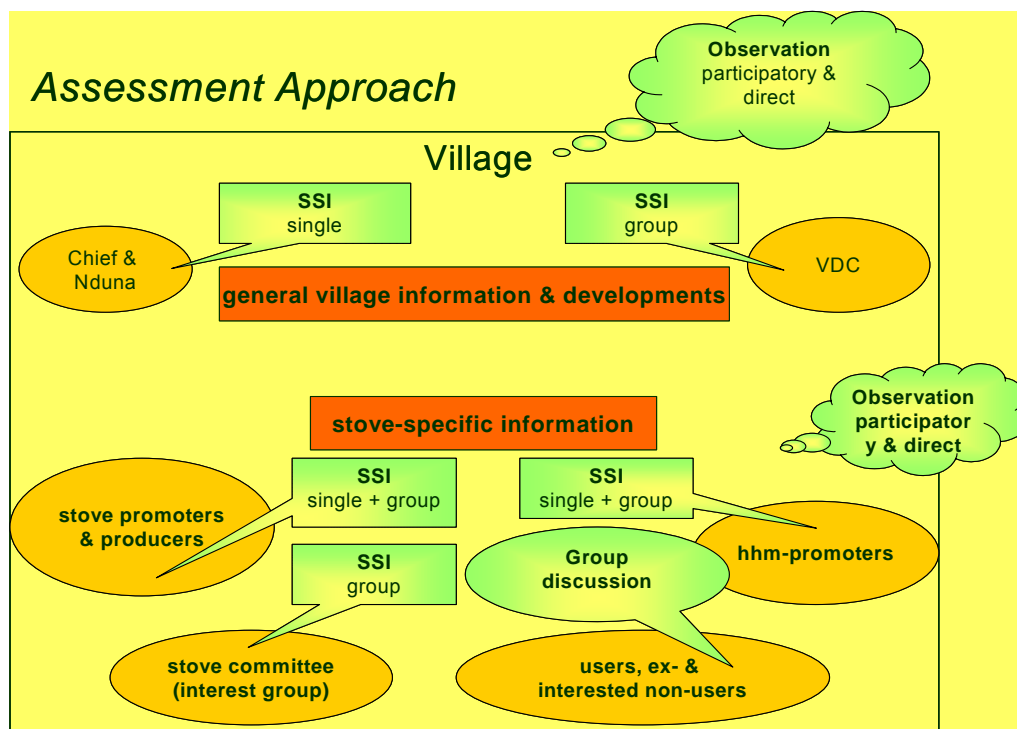


Fig.: Key informants, respective assessment methods and information levels

During the **field phase**²⁹ the four villages were visited for five days each. Participation in village life, direct and participatory observation³⁰ and semi-structured open interviews (SSIs)³¹ with specific key persons – according to the figure above – were supposed to provide impact information³². Three aspects were assessed to judge the impacts of energy saving stoves at household level.

²⁷ For the overview over the villages' characters referring to the selection criteria, compare Annex 2 Selection Criteria applied to the four Villages.

²⁸ For monitoring and evaluation with stove promoters/producers and stove-users, compare GTZ/HEP, ITDG & FWD 1996, pp. 22-37.

²⁹ The field visits took place from 19th July to 14th August 2004: Salamu from 19th to 23rd July; Ligomba from 26th to 30th July; Njete from 03rd to 07th August; Matanya from 10th to 14th August.

³⁰ Direct and participatory observation, while trying to take part in ordinary village activities, will provide more detailed insight and information about adoption, use and production of improved stoves. Compare also Schoenhuth & Kievelitz 1994.

³¹ Non-scheduled, semi-structured interview will allow the responders considerable liberty expressing their definition of the situation, although the encounter between the interviewer and interviewees is structured, and the major aspects of the study are explained to them. The main instrument for the interview is open questions: interviewees are asked to give an opinion on a subject. They are free to respond to a question however they like, and are not limited by existing codified answers. Compare also Schoenhuth & Kievelitz 1994.

³² For the research interests compare the exemplary interview-guidelines, Annex 3 Interview Guideline for Stove Producers & Promoters. Similar interview-guidelines for Chief & Nduna

- 1) Adoption of stoves, motivation and barriers to use
- 2) Impact achieved within Mulanje district
- 3) Challenges and lessons learnt concerning the improved cooking stoves

To examine the impacts a precondition is the adoption of stoves. Regarding the impacts, economic impacts for stove promoters and users, social and environmental impacts for the respective groups within the village were examined. These impacts were subdivided as follows.

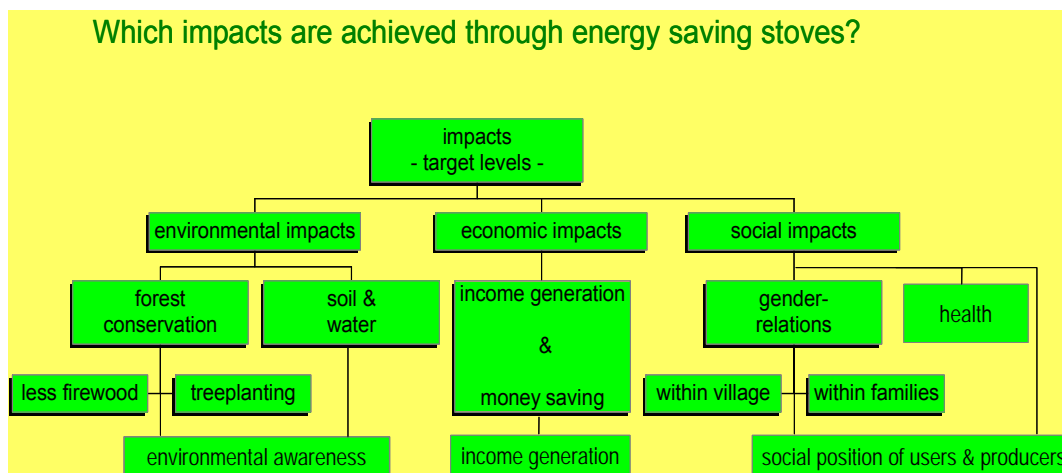


Fig.: Expected impacts of energy saving stoves in three different impact areas

The survey had a special focus on gender relations³³. As the target group is mainly women – using and producing stoves – impact of stoves concerning gender relations and influencing gender-equality were of special interest³⁴. Specific questions like the following led to indication of gender relations:³⁵

- What demonstrable impact does the project have for women and men?
- Does use and production of improved stoves influence gender relations within the village/within the family?
- Which impacts are related to practical needs, which to strategic interests?³⁶
- In which way are project-performances addressing women and men?
- Has the development of improvements and risks different implications for women and men?

During the **evaluation phase**³⁷ information, experiences and observatory material was crosschecked and discussed with IFSP project staff and extensionists. Thus field experiences were linked up with long-term IFSP experiences.

A second visit to the villages was considered as important to follow up results and impact of the first visit. The background of this follow-up visit is presented in the next chapter.

and for Users, Ex-users & Non-users were prepared as well, but according to limited space, one (but the most extensive) is presented in this report exemplarily.

³³ “Gender” describes a socially inscribed, individually learnt and culturally specified set of characteristics that identify the social behaviour of women and men, relationships between them and the way it is socially constructed. Gender is an analytical tool for understanding social processes. (“Sex”, by contrast, identifies the biological difference between women and men.)

³⁴ For general information about linkages between gender and energy compare UNDP 2004.

³⁵ Compare GTZ 1999, pp. 28-30 and GTZ 1998, pp. 11-15.

³⁶ Practical needs describe food security, health or workload of women, whereas strategic interests describe resource control, participation in decision making or shared responsibility, compare GTZ 1999, p. 29.

³⁷ The evaluation took place from 15th August to 18th September 2004.

3.3 Follow-up Visit

To follow up activities in the villages, they were visited again after a few weeks³⁸. The purpose of this follow-up was on one hand to observe performances and realisation of ideas and plans in these villages after a certain time and on the other hand to analyse the impact of the visit itself.

All of the four villages seemed to be very interested. Much enthusiasm emerged during the first visit, villagers expressed to produce stoves and to build a kiln, promoters explained to promote stoves and teach other villagers. To identify plans and wishes from real actions, to understand future-plans and schedules of implementing plans, it was considered as useful to observe activities carried out in the meantime. At the same time each village was performing quite differently, according to their respective circumstances. Different ideas and different development plans, which were envisaged, should be followed up during the second visit³⁹.

The following hypotheses justified and guided this follow-up:

- 1.) The villagers are mobilised by the impact assessment and motivated to further improve and increase stove implementation in their village, because they realised interest and acknowledgement from outside.
- 2.) Next steps and activities discussed and envisaged by villagers during the impact assessment have been started in the meantime, as there was a serious interest.
- 3.) The four villages are performing quite different, as experienced during the first visits. This can be proved by the follow-up visits.

Finally two presentations of main outcomes and results of the impact assessment were provided to IFSP and ProBEC staff. This final report contains all results, lessons learnt and recommendations based on the impact assessment.

³⁸ The dates were 28th August for Salamu and Matanya and 29th August for Ligomba and Njete.

³⁹ To compare the performances of the different villages, compare Annex 4 Performance of the different Villages before the Follow-up Visit.

4 Impact of Energy saving Stoves

The results of the impact assessment in the villages – which was the major step within the whole survey – are presented in this chapter⁴⁰. The information provided by the ProBEC questionnaire referring to Malawi and the outcomes of the follow-up visit complement and support the analysis of the impact assessment. Before being able to discuss the impact of energy saving stoves, it was regarded as necessary to analyse the adoption. This finally leads to lessons learnt from the impact assessment and recommendations for future planning.

4.1 Adoption of Stoves

Many households in the four villages used and experienced the energy saving stove – either the portable “Chitetezo Mbaula” or the fixed mud stove. Nonetheless several households used a stove for a certain time only and did not replace it after the end of its lifespan. Others were never motivated to use an improved cooking stove. During this assessment the villagers were grouped as **stove-users, ex-users and non-users**.

In the following, the general adoption-rate of stoves is discussed. The adoption-influencing factors are described to explain the circumstances in these rural villages. The different individual reasons for using or not-using stoves express villagers’ experiences with the improved stove.

4.1.1 General Adoption-Rate

The stove adoption-rate in the villages of Mulanje district varied a lot and for given reasons it is difficult to measure and judge. Generally speaking and according to the final project evaluation⁴¹, app. **29% of the households were currently using stoves**, the Mbaula being twice as common as the fixed stove⁴². Another 29% used the stoves in the past, but did not replace worn out or broken stoves and about 42% of the families never used a stove⁴³.

These results are comparable with outcomes of the ProBEC impact assessment, in the sense that in the four visited villages Salamu, Ligomba, Njete and Matanya, the adoption-rate was similar ranging from about 10 to 30% – depending on the activity of each village⁴⁴.

One reason for this high variation was **frequent breaking and new construction** of stoves. Periodically stoves got broken – in most cases due to rain and a lack of protective buildings as they could not be financed, which was the main problem and reason for damages. At the same time many new stoves were built periodically, related to a certain season of the year – the dry season from July to September, when rains are not influencing the stove construction. For these reasons, the number of stoves in a village varies a lot and it is always difficult to keep records. Secondly it is difficult to keep an overview over the number of stoves produced and in use, because it is **not recorded and documented**, neither by the stove promoters nor by the stove committee or other villagers.

⁴⁰ For village-specific outcomes of this assessment, compare Annex 5 Village-Specific Impacts.

⁴¹ Compare De Gabriele 2004. The final IFSP project evaluation was carried out in August/September 2004. This evaluation provides additional information, as stove adoption was assessed among others through a questionnaire distributed in randomly sampled villages. 249 households were interviewed.

⁴² Mbaula used by 18.9% and the fixed stove by 10.0% of the households; compare De Gabriele 2004.

⁴³ 29.3% experienced the stove in the past and 41.8% never used a stove; compare De Gabriele 2004.

⁴⁴ For stove adoption in the respective village, compare Annex 5.1.4, 5.2.4, 5.3.4 and 5.4.4 Stove Adoption.

4.1.2 Adoption-influencing Factors

Stove adoption was recognised as highly dependent on the village set-up. The major influential factor is the motivation and empowerment potential of the **stove promoters and producers**. They are the ones who facilitate and encourage the stove adoption in the village. If they are convinced and convincing others, awareness about energy saving stoves is increased, resulting in a higher adoption-rate. Especially in Salamu and Ligomba, where the stove producers are very motivated, they started producing in larger scale and built a kiln, encouraging many villagers⁴⁵.

This **commercial production** has more potential for the sustainability of stove implementation as there is a simultaneous economic improvement. Income generation through stove production is motivating to maintain this technology.

At the same time the neighbourhood to a village, where stoves are commercially produced can influence the motivation of stove promoters – which was the case in Ligomba⁴⁶. Stove promoters from Ligomba exchanged a lot with the stove producer in the neighbouring village Likalawe.

The acceptance of the stove also depends very much on the **quality of stoves**. Thus the raw material and the know-how and skills of stove promoters and producers are crucial for quality and lifespan of stoves. For the break through of this innovation, to convince villagers and to get their trust and acceptance, it is important that the stoves are long lasting.

Another relevant influencing factor is the **traditional leadership** of a village. If the chief, the Nduna and the VDC support the introduction and implementation of stoves, they get a “mandate” and the popularity increases. In Salamu the Nduna and the VDC are joining the stove committee and in Ligomba and Njete the chief is actively promoting stoves as well⁴⁷.

In the selected villages, it was not relevant if the **chief is a man or a woman**. Men were supporting the stove adoption like in Ligomba as well as women, if not more, compared to e.g. Salamu, where the female chief was not involved in improved stoves⁴⁸. The chief’s influence depends on his/her openness and awareness about these innovations, on his/her power and standing within the village, and on the relation with the stove promoters.

The **village size** influences the connection between the villagers themselves and the leadership. This connection appeared stronger in smaller villages like in Ligomba or Matanya than in larger ones like Njete, which are divided into sections with own Ndunas and own organisational structures⁴⁹.

The **duration of participation** in the IFSP project did not show any effects on activity and success of stove implementation in the village, whereas the **frequency of training and visits** by project staff, extensionists or other villagers was highly influencing the activities. In Njete – one of the pilot villages, but not visited too often during the last years – all activities concerning stove promotion or production seemed to be dormant⁵⁰. In the opposite to that many activities for stove promotion were carried out in Salamu and Ligomba, which joined later in 1999 and 2000, but were targeted regularly as they showed efforts in commercial production⁵¹.

⁴⁵ Compare Annex 5.1 and 5.2 Salamu and Ligomba Village.

⁴⁶ Compare Annex 5.2 Ligomba Village.

⁴⁷ Compare Annex 5.1, 5.2 and 5.3 Salamu, Ligomba and Njete Village.

⁴⁸ Compare Annex 5.1 and 5.2 Salamu and Ligomba Village.

⁴⁹ Compare Annex 5.2, 5.3 and 5.4 Salamu, Ligomba and Njete Village.

⁵⁰ Compare Annex 5.3 Njete Village.

⁵¹ Compare Annex 5.1 and 5.2 Salamu and Ligomba Village.

The **openness** of a village, the **educational level** or the connection to a highly frequented market or trading place – which are interrelated factors – appear as more relevant for stove adoption. Generally speaking, these are basic circumstances to reach the households, for production and marketing of stoves. E.g. in Salamu less educated households were more difficult to reach⁵². In Ligomba and Njete, the better educated chiefs were supporting the process⁵³. Therefore it seems that education and connection with trading centres are supportive for openness and understanding of innovations, but do not necessarily guarantee the adoption and production of stoves. In Matanya village e.g., which is very open-minded towards visitors and exposed to a trading centre in Kambenje, stoves were still not very popular⁵⁴.

Another critical factor is the **firewood availability**. The more firewood – as the main fuel – is available, the less effort is put into energy conservation methods. As many villages have their own forests, and some villagers were even growing their own trees, the firewood-pressure was not expressed as very strong. The higher the firewood scarcity, the stronger the pressure to look for alternatives.

Nevertheless a difference was visible comparing villages close to Mount Mulanje – the main firewood source in Mulanje impact area – with those out of reach of this mountain. The villagers from Matanya e.g. have used wood from the mountain for generations and meet their daily needs with it⁵⁵. Even though recognising a forest decrease, the improved cooking stove is not very popular.

The **availability of clay** and **distance to the source** could influence stove production as well. Although every village had a clay source in the neighbourhood, those in Salamu and Matanya were a distance to walk and therefore required more motivation and willingness to go there than in the cases of Ligomba and Njete⁵⁶.

Generally speaking, the adoption of an improved stove depends on a range of influencing factors. But finally the success of stove implementation is limited by engagement, motivation and prioritisation of individuals – stove promoters, producers as well as possible stove-users.

4.1.3 Individual Adoption

The individual prioritisation influences the purchase-decision of households and therefore the adoption of stoves. Apart from persuasion and motivation from outside, the individuals make their decision referring to own prioritisation and according to other (daily) needs. The following table shows a selection of main arguments of non-users, the reasons of ex-users not to replace a broken stove and the main advantages of stoves mentioned by users⁵⁷.

⁵² Compare Annex 5.1 Salamu Village.

⁵³ Compare Annex 5.2 and 5.3 Ligomba and Njete Village.

⁵⁴ Compare Annex 5.4 Matanya Village.

⁵⁵ Compare Annex 5.4 Matanya Village.

⁵⁶ Compare Annex 5.1, 5.2, 5.3 and 5.4 Salamu, Ligomba, Njete and Matanya Village.

⁵⁷ During village meetings the three groups (stove-users, ex-users and non-users) were exposed to each other and each other's argumentations. The users were asked to explain the stove's advantages to discuss about the stoves and to convince the other two groups. This discussion was also used to understand the non-users obstacles, to let them know about the stove's advantages and to talk about the weaknesses of stoves experienced by ex-users. Especially these shortcomings were focussed in the end, to find endo-community solutions. These are partly indirect others are direct statements by interviewees. Compare as well Annex 5.1.4, 5.2.4, 5.3.4 and 5.4.4 Stove Adoption in Salamu, Ligomba and Njete.

Non-users Reasons and arguments	Ex-users Reasons for not-replacing	Stove-users Advantages of stoves
<ul style="list-style-type: none"> • Stoves are not durable, they last too short time • Stoves easily break and are of poor quality • We do not know the importance • We do not know how to build stoves • Our friends did not teach us how to build them • They (promoters) refused to build stoves for us • I was away when the project started • Lazy and not interested • BUT often admiring the stove-users • Stove was not that important, busy with other things (garden, church etc.), but always admires the neighbour's stove • I did not ask how to make stove • I was sick when the group collected clay and was trained the last time • I do not know about stoves and their advantages 	<ul style="list-style-type: none"> • Major problem: breaking • Mbaula: stove breaks, if the soil/clay is not good and contains e.g. too much sand • Mbaula: they usually break when we fire them • Mbaula: if left outside and not properly fired, the rain damages it • Mbaula: if not handled properly they break • Mbaula: if you overload stove it breaks i.e. with a big heavy pot • Mbaula: breaks while carrying it around • Mbaula: when we are not present, children misuse or mismanage the stove • Fixed: when it is placed on the veranda, it can get damaged by rain • Fixed: if roof is not thoroughly thatched, the rain damages the stove • Fixed: when a house breaks down a stove is damaged together with the house • Fixed: when it stays for long time without maintaining, it forms cracks • Fixed: damages due to the wind 	<ul style="list-style-type: none"> • Less firewood is used • Stove retains heat even if you only have got little firewood and it keeps heat • Portable can be carried into the house • Keeps fire burning in one place and fire is not disturbed by the wind • Fast to cook on it • It's hygienic to cook on stoves • Food stays clean (because ash does not go into the food) • Accidents can be avoided and prevented • The kitchen is cleaner • Manage to be in time in the morning – cooking and boiling water for the bath

Non-users

Most of the arguments for not using an improved stove can be summarised as setting different priorities in everyday decisions. To specify this, theoretically it should be differentiated between the **ability to access** and the **interest to use**. Some villagers are not able to access a stove. They do not have the amount of money to buy one, they do not have the time and skills to build it themselves, they are old or sick. Some simply do not know and are not aware of the advantages of improved stoves. Others do not show any interest to use a stove, because they prefer to stick to their habits, they are prioritising other goods and activities or they were occupied by their everyday life.



Photo (vb): Njete – cooking on 3-stone fire

Practically and as the group discussion indicated, an innovation like the stove is not attractive per se. Villagers do not change their everyday schedule to build a stove or to buy one and get used to the new technique. Other activities like gardening or church can be more important. Other villagers are not convinced about the advantages of the stoves or might even have heard about bad experiences with poor-quality stoves. Many simply wait for people to come and teach them to build stoves or to give them a stove for free. They are not very progressive, do not take the initiative themselves and use weak arguments like absence or lack of information.

Ex-users



Photo (vb): Njete – broken fixed stove

The ex-users used the stove in the past and experienced its impacts, but the advantages compared with the disadvantages or unlucky circumstances were less decisive. They were not convinced by the advantages, but demotivated and discouraged by the weaknesses of bad quality stoves.

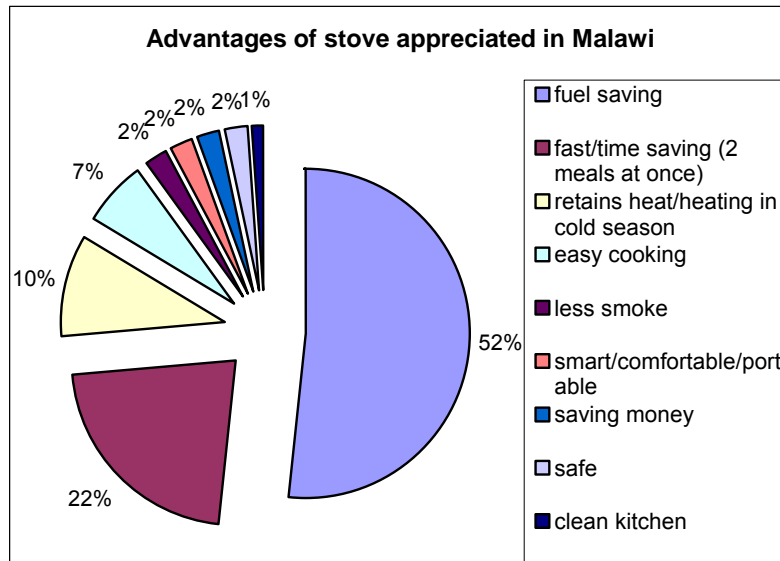
Stoves were of low quality, if certain skills were not obtained or information about new measurements was not available. The questionable quality of clay preparation and lacking firing also resulted in a short lifespan of stoves and overall poverty circumstances in the villages made the maintenance of the stoves even more difficult. These difficulties with stoves were so serious for e-users, that they were not motivated to rebuild the stoves.



Photo (vb): Njete – broken portable stove

Stove-users

The stove-users were convinced and appreciated the advantages and improvements. They would – or even already had – replaced the stove. Often they were the ones who were skilled enough to build a good stove or generated income through selling stoves. The advantages mentioned by the users were very much comparable with those given through the ProBEC questionnaire, where the users listed experienced advantages⁵⁸. As presented in the diagram, these ranged from fuel and time saving as most important, to heat retaining and easy cooking. Further mentioned were: less smoke, comfort and smartness, portability, money saving, safety and cleanness of kitchen.



⁵⁸ Compare Brinkmann & Klingshirn 2005

Several users had two stoves: a fixed and a portable one. They appreciated the fixed stove for its stability, whereas the portable stove was appreciated for its flexibility and that it could be moved to other places. They could cook inside as well as outside and during the cold season make use of its heating-function in the house. The fixed stove is preferred during daytime, when it is too windy to keep the fire outside. The portable Mbaula is used in the evening, when the winds calmed down.

Some families used the traditional 3-stone fire in addition for specific purposes. Resulting from the ProBEC questionnaire about 30% of the stove-users still need the 3-stone fire for special events or beer brewing. It was occasionally used, but depending on the frequency of usage, a larger stove would be a reasonable investment.

Regarding the stove adoption, one remaining question is, did the users manage to set good examples and to persuade the other villagers. Considering the obstacles of non-users and ex-users, this still remains a challenge.

The second question is, which impacts result from the experienced advantages of improved stoves. These impacts are analysed and further specified in the following section.

4.2 Economic, Social and Ecological Impacts

A common understanding of impacts prevailed in all villages. Those, who use or used the stoves and applied household management techniques, were aware of the advantages and appreciated them. Even villagers, who did never use them, knew about the improvements gained through these new stoves – their reasons for still using the 3-stone fire were not linked with the stove itself⁵⁹. The following impacts achieved with improved stoves and household management were discussed during the assessment⁶⁰.

4.2.1 Economic Impacts

Economic impacts were either achieved through money saving by using an improved stove or income generating by selling stoves and this money could be used for other purposes. Another impact was time saving, discussed as follows.

4.2.1.1 Money Saving

It was experienced that money could be saved with both the fixed mud stove, the portable Mbaula and respecting household management principles. The stove-users that bought or paid a collection fee for firewood recognised that they spent less money on firewood, because the stove requires less firewood compared to the 3-stone fire. Even if they had to build it or paid the current price of about 120 MK⁶¹ for a stove, this amount was quickly saved again.

Despite the recognised savings, the calculation of realistic amounts seemed to be comparatively difficult for most villagers. It was easier for them to compare the amount of firewood they needed before (app. 9 to 12 sticks for one meal) with the amount applied to the improved stove (app. 3 to 6 sticks of the same size). This leads them to **saved firewood of app. 50 to 60%**⁶². Those, who bought the firewood, remembered that they

⁵⁹ Compare 4.1.3 Individual Adoption.

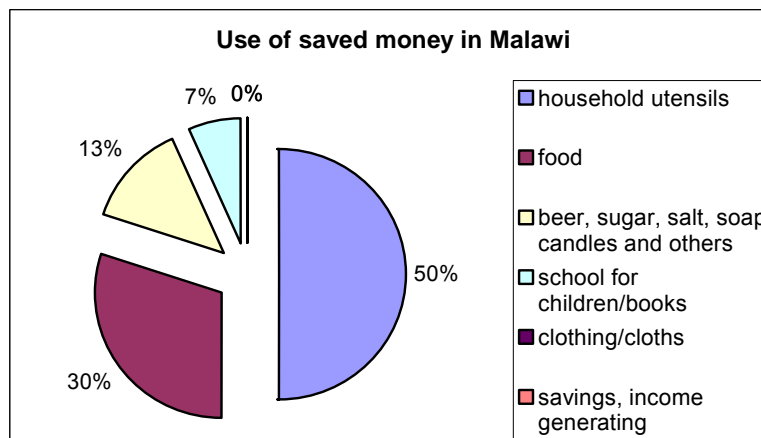
⁶⁰ For village specific impacts, compare Annex 5.1.5, 5.2.5, 5.3.5 and 5.4.5 Impacts in Salamu, Ligomba, Njete and Matanya.

⁶¹ MK = Malawi Kwacha, the value of this currency is about 100 MK to US\$ 0.95. To compare the prices, at that time the compulsory day-labourer rate in Malawi (e.g. the income of a watchman) was 60 MK per day. The tea estates paid the watchmen 120 MK per day. 3000 MK per month are tax-free.

⁶² 50% of firewood saving is realistically achieved by households using stoves. 60% savings can be reached, e.g. during cooking demonstrations, when all circumstances are optimal: the dried and chopped firewood, the prepared food and possibly the use of a food-warmer.

used to spend about 100 to 150 MK on firewood per week, and with the energy saving stoves it was only about **50 to 70 MK weekly**. This is an improvement for the very poor households in Mulanje district. Even for those, who collected the firewood, the saving aspect was relevant as most of the wood sources were public or community owned forests, where a small fee was taken.

This money could be allocated for other purposes. Despite the diffuse utilisation and thus the difficult naming, some interviewed households were able to mention specific purposes. These were very similar to the alternative utilisation mentioned in the ProBEC questionnaire, which came to the following result⁶³.



Most of the saved money was used for household means or food. Some was spent on special products like beer and sugar, and comparatively little on school and books for children. This shows that saved money could bring improvements to rural families' life.

4.2.1.2 Income Generation

The other economic impact of improved cooking stoves was income generation through the sale of stoves. Taking into consideration that the commercial approach was introduced recently⁶⁴, this commercial production has started to establish itself.

In some villages the producers already marketed very actively, like in Likalawe or Kambenje; these steps are followed by Salamu and Ligomba⁶⁵. Salamu has built a kiln, which was not finished at the time of the study. Ligomba's producers, together with some interested and motivated villagers, produced a huge number of stoves (about 60 in 2 weeks). They started building a kiln as well.

The prices for stoves varied a lot from 50 MK to 200 MK, but the producers got motivated **to sell them at least for 120 MK** to cover the production costs. Comparing with the ProBEC questionnaire, those who commercially produced **earned between 200 and 1,300 MK per month**. This is a good contribution to the household's income⁶⁶. The women sell the stoves for money, some for goods like maize, chicken, beans or firewood and most of them keep the money themselves. Only few give the money to other family members.

Many producers and joining stove-users, who build stoves for others, were uncertain about the markets for their product. Marketing seems to be a relevant training need, as many are not used to market economy systems. To cover this need, the stove produ-

⁶³ Compare Brinkmann & Klingshirn 2005.

⁶⁴ Compare 2.4 Integrated Food Security Programme (IFSP).

⁶⁵ Compare Annex 5.1.3 and 5.2.3. Stove Promotion & Production in Salamu and Ligomba.

⁶⁶ The **compulsory day-labourer rate is 60 MK per day**, which is (multiplied by 20 days) 1200 MK per month. A minimum wage as such does not exist in Malawi, but 1200 MK monthly is already at a very low level.

cers received training in marketing by IFSP project. After that they were supposed to be resource persons to solve marketing concerns in the villages⁶⁷.

4.2.1.3 Time Saving

Many stove-users, promoters or producers mentioned the saved time as an achievement, but in most cases the saved time could not be calculated and specified, because time was not measured. Therefore it was difficult for most interviewees to name the hours saved and used for other purposes.

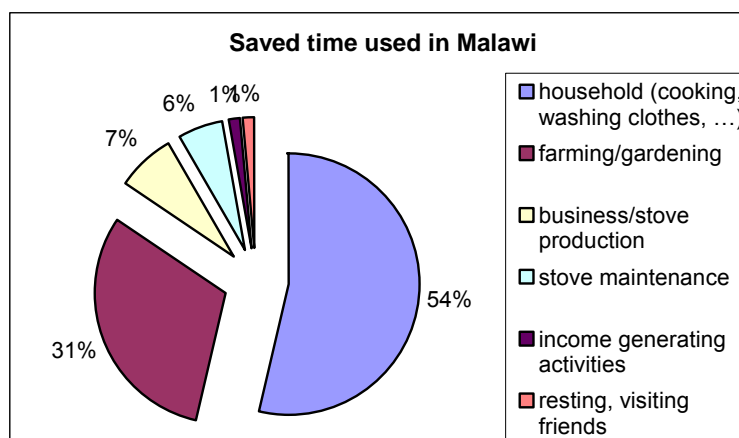
Firstly time could be saved during firewood collection. However this time saving was expressed in two ways. They either go less often to the firewood source (instead of three times only once a week) or they go as frequently as before, but with less wood load to carry. Firewood collection could take a couple of hours, depending on the distance to the source, and if the women (or other family members) did not have to go as often as before, this was a relief for them. The time could be used for other activities. Even if they go as often as before, but collecting less, it saves time and furthermore it is a relief for their backs.

Other women experienced time saving during the cooking process. They explained that the stove cooked faster than the 3-stone fire. This could be due to the number of stoves in use, as many households were using two stoves. Another explanation could be the number of “boilerplates” at the fixed stove. There are two fireplaces and therefore two things could be cooked at once. Conversely in most cases only one 3-stone fire was used. Else it was only experienced by some users and not proved, that the stoves really cook faster.

As this is an improvement, which is difficult to grasp, the interviewees in the ProBEC questionnaire had difficulties to answer time related questions as well. Nevertheless, they proclaimed that time was saved and thus an interesting question is the alternative use of saved time.

The interviewed users spent more time on homework, farming and gardening; a few were active in businesses, stove maintenance or resting and social interactions.

This is an impact as long as the users experience having more time for other activities, which can improve the family life.



4.2.2 Social Impacts

Social impacts were identified regarding health improvements, social appreciation of stove-users, stove promoters and producers, the gender relations within the family and the village and finally the establishment of stove committees as interest groups in villages.

⁶⁷ Compare Tawha & Owala Odhiamdo 2004. For marketing training also compare ITDG 2004.

4.2.2.1 Health Improvements

Compared with the traditional way of cooking on the 3-stone fire, the **amount of smoke around the fireplace has decreased** a lot. This was experienced by the stove-users and confirmed by the ProBEC questionnaire. Whether the cooking place was outside or inside the house, the relief due to smoke reduction was expressed very often and quite obvious to observe. Many smoke related health problems like **respiratory diseases, headaches, eye burning, etc.**, decreased therefore as well.



Photo (vb): Salamu – stove producer

The whole cooking place was cleaner and **more hygienic**, as there was less smoke and less ashes. The stoves and the additional IFSP household management supported a better kitchen climate, attracting less flies and bacteria to breed. Due to improved food preparation and less ashes and smoke around the pot, the food was cleaner and healthier.

Stove and household management promoters were trained in the organisation of kitchen and food preparation. Recommended utensils to improve the kitchen were the stove, with food-warmer, shelves for cleaner plates, pots and ingredients and a chair for a better cooking position. To improve the food, certain vegetables, spices or herbs should increase the variety and cooking should not be overdone, to retain the necessary vitamins. It became apparent that those villagers, who were honestly interested, followed the recommendations – but they were not the majority. Most of them were stove promoters or producers (and not even all of them) and open-minded, educated and convinced users, but they were also the ones who taught and influenced the other households in their villages.

Finally the stove-using families experienced the stove as safer, with **less accidental burns** occurring. The fire was smaller and kept within the stove. It could not spread easily and cause accidents with children or burn down whole houses. This is an improvement for many families as injuries happened and kitchens were damaged quite often.

4.2.2.2 Social Position of Stove-users, Promoters and Producers

Most of the stove and household management promoters were jointly working together and taking over both issues about stove production and household management. Through this cooperation they were supporting and strengthening each other in many cases.

The stove promoters (as well as the household management promoters) were working in pairs in each village. They were chosen and elected by the villagers or appointed by the chief. It was likely that one had the mandate from the community, because she was already active in the village or a known character, and the other one came in to support. Consequently the competences of the two promoters differed a lot. Often one was already very experienced in pottery, working with clay or mud; she had necessary skills and talents to produce good quality stoves. Whereas the other one was less talented, which could cause jealousy in terms of hindering, spreading wrong information or resigning and leaving the other promoter with everything.⁶⁸

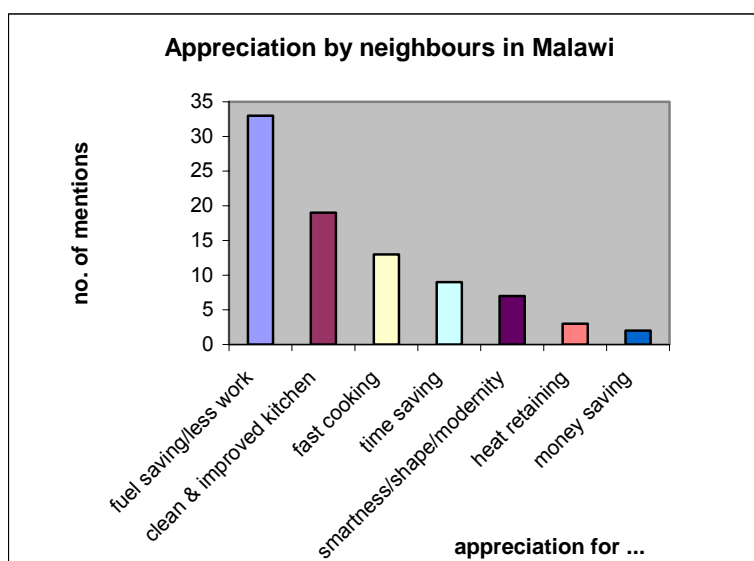
⁶⁸ The intended idea behind this system of having pairs was to share the workload and the experiences and to sustain IFSP activities even in the difficult times of frequent cases of

The stove producers, who started commercial production in larger scale, were the active, progressive and productive ones among the stove promoters. They were identified during the last two years and received special training in quality control, firing, kiln construction and marketing. With these additional skills they started to produce stoves for others, but – according to the former self-help approach – they also produced stoves in cooperation with other interested villagers. This means, if villagers wanted to build stoves for themselves or others, the commercial producers were open in many cases to cooperate with them and to have joint demonstrations and kiln firing.

The stove-users and those who were convinced by the stoves were quite often villagers, who were motivated, open for new ideas and eager to improve their living conditions. The promoters, producers and even the stove-users were in most cases more open-minded, progressive and skilled in clay work. According to this, people involved in stove related activities, often had the reputation of being innovative villagers, who contributed to the village development and therefore many families appreciated them.

Correspondingly households, which were aware about, but not using stoves, often expressed their interest of getting one and being as developed as the others. Still, it's only a minority that turns this interest into action; others are still held captive by their everyday habits, challenges and problems. Nevertheless this indicates the positive reputation and appreciation of stove-users.

Differentiating the appreciation of stove-usage, the results of the ProBEC questionnaire can be taken into account. The main improvement appreciated by other villagers was saving of fuel and reduction of workload. They also recognised the clean and improved kitchen. Others mentioned that they like the fast cooking, time saving, the smartness and modernity of the stove – it seems to appear as an innovation of development and modernity. Few mentioned the heat retaining aspect and money saving.



it seems to appear as an innovation of development and modernity. Few mentioned the heat retaining aspect and money saving.

The stove promoters and producers themselves also made positive experiences. They often mentioned that they enjoy fulfilling this task in the community. They feel **respected by leadership, other committees as well as by the villagers** themselves. Observation proved that those, who take the responsibility and activities of a stove promoter seriously, were respected by other villagers and involved in discussions by VDC or chief. And vice versa the VDC and other leaders of the village were sharing stove related issues and joined the stove committee meetings. Therefore the stove and household management promoters often had a **good self-confidence for playing an important role in the village**. They are involved in the development of the village, which has the potential to bring about structural, long-term changes.

death due to rapid spreading of HIV/Aids. However it should be taken into consideration, that while they can support each other, they also could hinder each other's work.

4.2.2.3 Gender Relations within the Family and the Village

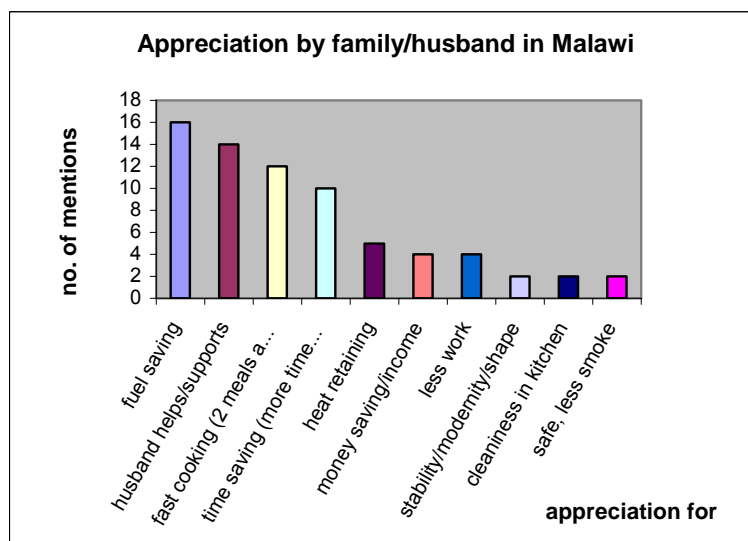
In Mulanje district the majority of villagers involved in stove production and use are female. Malawians traditionally have a very specific task sharing between men and women, where men would never do women's work in household and garden, and women would never interfere with men's activities. It is the traditional responsibility of women to organise food, cooking and moreover to collect, store and prepare fuel – firewood in most cases. Within this set-up of task sharing, women are the main target group for the improved cooking stoves – as stove-users, stove producers and promoters.

At the same time, the stove innovation **influenced these gender relations in families and villages**. The general positive reputation of the improved stoves put the women involved, in a positive perspective. They were regarded as the ones who bring new ideas, support development into the village and help other families. These women appeared as innovative and progressive. The villagers therefore appreciated them – aside from jealousy cases. It became apparent, that even many male villagers were generally interested in stoves as a new technology. Keeping the previously mentioned gender related task sharing in mind, it was noteworthy, that men started becoming involved in stove-implementation as well.

At family or private level husbands became interested in the stoves used by their wives. Some supported them building a stove, some contributed money to buy a stove and some even cooked from time to time, when the wife was not there. Men would have never done their own cooking before, on the 3-stone fire, as this was too uncomfortable, too much smoke and ashes, too primitive work⁶⁹. Now with the new stoves several women explained that their husbands cook, when they are absent. And some statements given by the interviewed men confirmed this interest. Men became more open to women's activities and even shared workload. Women are recognised as innovative. This leads to the assumption that the gender relations became more open and the previously separated tasks were merging. But it should be admitted, that these cases were still rare in the four visited villages.

Referring to the results of the ProBEC questionnaire, a general appreciation by family members and in particular husbands could be validated.

The husbands and family members appreciated the aspect of fuel saving most, and they even helped and supported the implementation of stoves in various ways (spending money, carrying clay, building stove, collecting firewood). They appreciated the fast cooking and time saving. Heat retaining, money saving and less workload were relevant as well. Only a few mentioned the stability and modernity of stoves, the clean kitchen and the smoke reduction and safety. If these achievements are associated with the stoves and its users and pro-



⁶⁹ This was a statement by different women, especially in Salamu and Ligomba.

ducers, it becomes traceable how and why there is an interest from other family members.

At village level, women took part in discussions about village development and contributed in terms of energy saving, health improvements, money saving and other impacts of stoves. At the same time, men became involved in this innovation, as they partly built stoves themselves and discussed achievements and challenges of stove introduction and production. E.g. the VDC in Salamu was concerned about marketing and selling stoves and the male chiefs in Njete and Ligomba were actively promoting the stove adoption⁷⁰. They tried to mobilise villagers and to set an example for stove adoption, using stoves in their family.



Photo (vb): Salamu – VDC with self-made fixed stove

In all these cases a tendency is visible. **Women are improving their social position and role in the families and villages, men start to be concerned about household issues**, and the relation of men and women is not that rigidly adhered to any more – after introduction and exposure to this more or less new technological innovation, which seems to appeal to women and men.

4.2.2.4 Establishment of Stove Committees

As a result of stove introduction and training, the villagers together with the promoters established so-called stove committees⁷¹. These stove committees were not intended by IFSP, but grew in many villages due to internal developments and the intention to jointly produce stoves.

In most villages these committees consisted of the household management promoters, stove promoters and producers, some stove-users building stoves for others and non-users intending to build a stove. These committee members seemed to be more or less constant, as the groups were able to name them. In all cases the promoters were coordinating the committee. Its purpose is to exchange knowledge, information and construction techniques between the promoters, who attended the training and other villagers, and to produce together. The committee members went together to collect clay and then prepared it, moulded the stoves and collected firewood to fire the stoves. For these purposes there are meetings and stove demonstrations, most of them in the dry season, when they usually build stoves.

These stove committees can be regarded as interest groups rather than as political committees, which represent concerns of the average villagers and common welfare. Even though the committees were not meeting regularly and not representing everyone's interest in the village, they seemed to be regarded as **part of the village leadership structure and an institution to organise the stove-users' and producers' demands and concerns**.

⁷⁰ Compare Annex 5.1, 5.2 and 5.3 Salamu, Ligomba and Njete Village.

⁷¹ Several different committees were established in a village, dealing with common questions and activities related to the development of their village. Some of them were introduced by the IFSP project; others already existed due to the traditional leadership structure in the villages.

4.2.3 Environmental Impacts

Environmental impacts were experienced in terms of firewood saving and thus reduced deforestation, which influences soil improvements and water control. Environmental awareness could be gained to different extent. The cooperation with forest committees started recently and was supposed to channel environmental activities.

4.2.3.1 Firewood Saving and Reduced Deforestation

The aspect of fuel saving was the most obvious experience for the stove-users. This was one of the major impacts for them. Fuel saving – firewood in most cases – does not only provide economic benefits in terms of saved money or time, it also has environmental impacts. Taking into consideration that the amount of **firewood used with the 3-stone fire is about twice or thrice as much as with energy saving stoves**, a lot of wood can be conserved. If the pressure on firewood is reduced and the amount of trees felled is minimised, it will contribute to improvements of the forests as well.



Photo (vb): Salamu – firewood required with Mafua



Photo (vb): Matanya – firewood needed with improved stove

The forests, bushes and hedges in Mulanje district were decreasing. The only major – but also decreasing – firewood source is the Mulanje Mountain area. Those villagers, who experienced scarcity of firewood, were becoming aware of the changes. They tried to identify alternatives and were in many cases very open to the improved stoves. At the same time they started planting trees with the support of IFSP and other projects. With these project approaches of afforestation or agro-forestry, the villagers became involved in **counteracting deforestation** and increasing the number of trees around villages – in particular those far away from the mountain.

The villagers' perception about changes in the forests was quite obvious as 68% of the ProBEC questionnaire interviewees experienced increasing deforestation. The counter activities recommended by them were mainly tree planting, tree nurseries and the use of the energy saving stoves. Very few mentioned awareness raising, household management or respective bylaws⁷².

4.2.3.2 Soil Improvements and Water Control

Soil degradation and erosion was experienced quite often especially around Mount Mulanje. Having continuously fewer trees, there are no roots to take up and keep the water after heavy rainfalls. The villagers remembered floods carrying away the soil. Wind erosion worsens this and arable land – especially the fertile top layer – is blown away and lost. **Villagers experience that forests, bushes and hedges fulfil an**

⁷² Compare Brinkmann & Klingshirn 2005.

important role in the rural area. Even if they were not able to explain the process and cycle system, they were aware of changes and results and, therefore they would be more open to do something about these phenomena.

Referring to the ProBEC questionnaire outcomes, 72% of the interviewees recognised increased soil degradation and mentioned several counter activities: most of them recommended tree planting and joint activities by villagers, others recommended ridges, green manuring and water catchments conservation. Fewer interviewees mentioned mixed farming, household management or the improved cooking stoves. But it has to be admitted that these links to household management and stoves were very abstract.

4.2.3.3 Environmental Awareness

There was a certain awareness about the conditions of forests, trees, soil and water in the villages, but no general awareness about the need for environmental protection and conservation per se. The villagers rather perceive nature as resource base to fulfil human needs and demands. This is understandable as they are living within nature, using natural goods – mostly free of charge. This means that they are **concerned about their vital resource base**, if they are talking about the environment. Leaving this discussion about natural perceptions open as it is, the relevant aspect is the awareness about changes and the willingness to act.

Villagers living close to Mulanje Mountain, see that trees are disappearing, floods are destroying their land and soil is degrading. But as long as they are able to find enough for themselves – even if they have to walk further distances – they do not worry too much. The higher the resource pressure the more people start discussing the natural resources and thinking about counter activities.

In relation to energy saving stoves, those who live closer to the forest (Mount Mulanje), did not see the need for such a stove. This does not mean that the stoves are not used there, but the introduction was comparatively more complicated than in other areas. Some were using it, but these were in many cases the interested, educated and foresighted people. At the same time, very few regarded the stove as linked to environmental improvements. The majority think first about economic aspects before mentioning the environmental benefits.

Considering the ProBEC questionnaire results, most of the interviewees recognised environmental changes – but some mentioned improvements others degradation. Apparently they had different perspectives: some were thinking about environmental effects of the energy saving stoves, whereas others were looking at the general environmental development. Those, who saw environmental improvements, thought about more trees and less deforestation (about 50%), due to reduced firewood use and less bushfires. The others (about) 50% identified environmental degradation, deforestation, soil erosion and less rainfall.

These exercises show that the **cognitions of environmental changes, grade and quality, were very different and depend on the interviewees' perspectives**. Environmental awareness is a very general expression and its understanding depends very much on own experiences of resource scarcity and the people's educational level. Many villagers saw changes, but did not worry about them. Environmental changes were judged in different ways.

4.2.3.4 Cooperation with the Forest Committee

In the villages IFSP trained the already mentioned stove and household management promoters and also one forest promoter in each village. The villagers themselves established respective stove and forest committees. These committees were supposed to

work together, but in fact this happened very seldom. In some cases, the forest promoter joined the stove committee, because of interest in stoves. But the link to planting of trees, caring for forests, interacting vice versa with the forest committee was not practiced. Here the cooperation could be improved.

4.3 Lessons learnt – Critical Points and Challenges

Most of the households in the four villages knew the improved cooking stoves. The information about stoves, their availability, use, improvements through stoves and also their difficulties were known in the villages. The awareness of their impacts was spread among many villagers. The improvements and impacts were obviously appreciated by promoters and stove-users, but ex-users were also aware of this innovation and even many non-users had heard about changes regarding the stoves.

Major challenges remain with the scaling-up of stove implementation – convincing more people, to give the stove a priority in their everyday life decisions. But it is difficult to simply judge the adoption as indicator for success and breakthrough of the improved stoves, without considering the previously mentioned influencing factors⁷³. To increase the implementation of stoves, it would be worthwhile to focus on the most crucial influencing factors⁷⁴.

4.3.1 Stove Adoption and Implementation

Stove adoption and implementation is influenced by various factors as discussed before. With regard at the village level, it mainly depends on the following.

1. Education and knowledge within the village & Awareness about general resource (wood) availability & Time it requires for internalisation of changes
2. Involvement and support of traditional leadership – male or female chief, Ndunas and VDC
3. Skills, know-how and motivation of promoters and producers
4. Quality of stoves – clay source, clay storage and preparation, technology transfer and proper kiln firing & Acceptance of stoves and estimation of their value, influenced by the previous self-help approach
5. Frequency and regularity of village-visits and training

These were identified as crucial factors, recommended to be considered, in order to understand the status quo of adoption and to further improve the implementation.

4.3.1.1 Education, Openness and Awareness within the Village

The educational level of the village is an important condition, crucial in general for the openness and ability to internalise a new technology, as well as in particular for the understanding of environmental processes and firewood availability. This indicates that a lot of education and awareness rising would still be required to reach the villagers and gain them as stove-users. This includes especially schools as partners in the project. Some schools were already targeted by the IFSP project – as they were presented institutional stoves – but in the four visited villages schools, teachers and pupils were not explicitly involved.

It would be a challenge to include schools and teachers and therefore to reach many children. Teachers could be involved in stove construction by promoters or buy stoves

⁷³ Compare Annex 4.1.2 Adoption-influencing Factors and Annex 5.1.4, 5.2.4, 5.3.4 and 5.4.4 Stove Adoption in Salamu, Ligomba, Njete and Matanya.

⁷⁴ Compare Annex 5.1.6, 5.2.6, 5.3.6 and 5.4.6 Lessons Learnt in Salamu, Ligomba, Njete and Matanya as well.

from commercial producers. Stoves could be used in schools, and children could be taught about energy conservation. As children would go back to their families, many households would be reached and energy conservation knowledge would disperse through the whole village society.

4.3.1.2 Involvement and Support of Traditional Leadership

The traditional leadership plays a vital role in stove introduction and adoption. Chiefs, Ndunas and VDC members can be very contributive for stove implementation as they are respected authorities. Realising that some are more powerful than others (chiefs in Ligomba and Njete were very respected compared to the one in Salamu⁷⁵), they can have an influence and set good examples for other villagers.

The assessment proved that it did not matter, if they were male or female, both could support the stove implementation. This depended more on personal interests and openness of the chief. Finally the potential and competence to convince villagers was related to the chief's reputation and standing within the village. According to this, it seems relevant to identify innovators amongst chiefs and other traditional leaders in the villages and to involve them into the project as potential motivators and mobilizers of stove implementation.

4.3.1.3 Skills, Know-how and Motivation of Promoters/Producers

The promoters and stove producers were the crucial persons in the village to introduce, promote, produce and thus implement energy saving stoves. Their popularity, motivation, skills and know-how were heavily influencing the success of stove implementation. According to the assessment, most of the villagers knew the promoters or stove producers. But the impact of these promoters depended very much on their social position within the village. Therefore the implementation of stoves is not guaranteed by simply electing and referring to these promoters or producers. They have to be carefully identified as innovative "partners", as their motivation and reliability is important for the project – not everybody is a promoter or producers⁷⁶.

Besides these personal skills, the promoters and producers need to have or receive specific technical skills and know-how. These skills and know-how varied a lot and too many bad quality stoves were spread. It even happened that those, who were supposed to train others, were not aware of new moulding techniques or right measurements. A qualified and repeated training of selected promoters and producers and the exchange with other producers is considered as vital for the quality of stoves and therefore the confidence of villagers in stoves.

4.3.1.4 Quality of Stoves & Acceptance and Valuation of Stoves

As mentioned before, in many cases the quality of stoves was questionable. Complaints often focussed on durability and lifespan of the stoves. Many users experienced breaking stoves and did not replace them because of disappointment and mistrusting in their durability. This even affected villagers, who never used stoves. The bad reputation, due to poor quality of stoves, is heavily influencing the stove adoption.

Besides the skills of promoters, the former self-help approach contributes to this reputation. Interested villagers, who were trained by the promoters, seldom produced quality stoves. Despite the shift to the commercial approach, this old approach still existed in the villages, as everybody got used to it. Consequently it resulted in refusal to buy and invest money in a stove, as they regarded stove production as something com-

⁷⁵ Compare Annex 5.1.2, 5.2.2 and 5.3.2 General Village Information about Salamu, Ligomba and Njete.

⁷⁶ Compare Annex 5.1.3, 5.2.3, 5.3.3 and 5.4.3 Stove Promotion & Production in Salamu, Ligomba, Njete and Matanya as well.

paratively easy, everyone could do. But as they were lacking the respective skills, many villagers were not able to replace their broken stoves or made less quality stoves. This shows that the self-help approach has to go along with a proper and intensive training and follow-up visits. Otherwise quality is not given and users underestimate the value of a properly constructed quality stove. The transition towards commercial quality-stove production is made more difficult.

The fact that the promoters provided their training free of charge – according to the self-help approach – also influences the underestimation of quality stoves. According to the idea that training should not be exclusive, everybody got the opportunity to make an own stove. Compared to this, the purchase of a commercially produced stove costs an amount and the difference in terms of money is very high. Many people stick to self-production rather than buying a stove.

An important marketing aspect for stove producers would therefore be the quality. The value of quality stoves and the service of stove production have to be communicated more intensively and the stove producers should be trained in promotion and sales tools.

Additionally – as the shape and thus the quality of stoves varied a lot – moulds were introduced to commercial producers. According to the skills of producers, promoters and villagers, the shapes were very different, but to ensure the improvements of the stove, it is important to keep certain measurements. It was recognised that moulds were a big relief concerning an equal and qualitative shape of the stoves – even though very talented women were able to produce proper stoves without moulds. At that time moulds for the stove's circumference, the doors and the potrests were provided by IFSP. For quality reasons and to ease the production of stoves, it was planned to distribute moulds to promoters of villages, where commercial production is envisaged.

4.3.1.5 Frequency and Regularity of Village-visits

The village impact assessment in general and the follow-up visit in particular indicated that regular visits, follow-ups and frequent knowledge exchanges are vital for the initiatives and for a continuous process in the villages. Those villages, which were more often frequented by project staff or EOs, were more active. Even the impact assessment visits themselves had their impacts concerning empowerment and motivation to carry out activities. After only a few weeks, during the follow-up visit the villages Ligomba and Matanya showed several activities, which expressed their increasing motivation⁷⁷. The villages recognised their importance and the promoters improved their linkages with other actors.

In opposite to these initiatives, Njete as a pilot village did not show any activities. Initially the village was very active, but since it was not visited frequently, non or very few stoves were built. The promoters were very re-active, they only built on demand, but did not actively promote⁷⁸.

On one hand this shows, which of the villages and promoters really take the stove implementation seriously. On the other hand this shows that stove implementation still seems to be at a fragile stage, where support is needed. It is considered as important to increase the interaction between relevant key persons in the village (leadership, promoters, producers, users and non-users) and projects, extensionists and other villages. Particularly the exchange with other promoters and producers is encouraging.

⁷⁷ Compare Annex 5.2.3 and 5.4.3 Stove Promotion & Production as well as Annex 5.2.6 and 5.4.6 Lessons Learnt in Salamu and Matanya.

⁷⁸ Compare Annex 5.3.6 Lessons Learnt in Njete.

Only a few villages like Ligomba and (after some motivation from outside) Matanya organised exchange themselves⁷⁹.

4.3.2 Impacts of Stoves

Many impacts of energy saving stoves were recognised by stove-users and ex-users – even many non-users were able to mention at least one or two impact-examples. But the assessment proved that many impacts were not clearly understood or experienced, and thus many impacts did not convince the majority of villagers.

4.3.2.1 Economic Impacts

It is obvious that people realise the advantages of energy saving stoves more easily, when this is expressed in terms of money, for instance when they spend less money on firewood compared to the 3-stone fire⁸⁰.

The main challenge within economic impacts was to achieve people's understanding of calculation. Many of them mentioned the economic benefits in terms of money and time saving or income generation, but only very few were able to calculate this economic benefit. In most cases they could just roughly estimate the savings, used for other purposes. The promoters themselves were not clearly calculating economic impacts and thus they had difficulties to convince other villagers.

If promoters and producers want to overcome the villagers' main argument of poverty – that they cannot afford a stove – they have to be able to explain the economic impacts of stoves. The relation between the stove's price and the cost of firewood (price for sold firewood, physical effort of collection etc.) should be demonstrated by promoters and producers.

Another expressed concern was marketing. Several villagers, VDC members and chiefs were concerned about the opportunities to sell the stoves, which they wanted to produce. The promoters just recently received training in marketing and thus they were not experienced in this area⁸¹. The Intermediate Technology Development Group (ITDG) developed a manual for marketing training, which provides inspiration, explanation and guidance about marketing and could be considered⁸².

4.3.2.2 Social Impacts

The social impacts were clear to most people involved in stoves. The changes on family as well as on village level concerning gender relations, reputation, self-confidence and organisational improvements were recognised and encouraging for stove promoters, producers and users.

4.3.2.3 Environmental Impacts

The environmental impacts were difficult to grasp within this assessment. The villagers responded to environment related questions rather in terms of natural resources. They realised that the availability of arable land and firewood declined, but this didn't stimulate them to look for alternatives. At the same time linkages between impacts of stoves and conservation of natural resources were seldom realised. Only a few like the promoters and producers, who received training and attended workshops, had a broader understanding of environmental impacts, but apparently it was difficult for them to transfer this knowledge to other villagers.

⁷⁹ Compare Annex 5.2.3 Stove Promotion & Production in Salamu and 5.4.6 Lessons Learnt in Matanya.

⁸⁰ Compare Money Saving, chap. 4.2.1.1.

⁸¹ Compare Tawha & Owala Odhiamdo 2004.

⁸² Compare ITDG 2004.

5 Conclusions & Recommendations

In most cases stove implementation was recognised as part of the village development. Particularly the experienced and identified impacts of energy saving stoves gave evidence of improvements of households within the rural area. The establishment of stove committees and the involvement of the village leadership (chief, VDC, etc.) strengthened the work of stove promoters and at the same time this demonstrates that the contribution of improved stoves to the development of the village was realised.

However this was not always reflected in the adoption rate within the visited villages and there were even more stoves in use at the beginning of the project. This decrease could be explained with the initial self-help approach, where stove were constructed by beneficiaries themselves with free instruction and guidance from promoters. Many families built and received stoves in the beginning without maintaining them. In the meantime it became apparent, which villages and who within the village was honestly interested in this innovation and took over responsibility. In conclusion those were the ones, who attracted attention through maintaining and producing stoves, and thus they were addressed during the shift towards commercial production.

To proceed and maintain stove implementation, a number of highly committed promoters were already identified and involved in advanced training to achieve specific skills for commercial production. They were trained in quality control, kiln firing and marketing. It is a challenge to thoroughly identify these further commercial producers as innovators amongst stove promoters. Another challenge would be to avoid jealousy and refusal of other villages and promoters. Therefore it is recommended to continue involving them, to keep an eye on other villages and leave this number of commercial producers open.

Regarding stove adoption and stove-related activities in the villages, training and exposure visits proved to be very motivating.

Many experiences were gained in Mulanje and thus it is a source of know-how, which should be available for other people, who are interested in the implementation of energy saving stoves. Through training, Mulanje's stove producers had the opportunity to exchange and develop new improvements with other stove producers. And through the village visits they were exposed to interested people from outside and they could present their experiences as experts. This was very motivating for those, who are active in stove implementation – this could be experienced during the impact assessment as well. It strengthened the self-consciousness of involved villagers.

Herewith the demand for further networking between service providers (projects or extension officers), the stove promoters and producers and other experts in stove production from outside Mulanje district should be emphasised.

This involvement of stove producers in training and exposure visits is encouraging and empowering. At the same time it creates ownership, so that stove production, marketing and adoption gets handed over to the stove producers. Through commitment, ownership and a good network the improvement and implementation of stoves has the chance to be sustained.

To improve the work of these stove producers, several training needs were still expressed and visible. The main demand still referred to quality control, economic calculation, reasonable pricing and marketing training⁸³ and identification of market opportunities for stoves, which was already tackled during the ProBEC training on commercial production.

⁸³ For further need for marketing training, compare Income Generation chap. 4.2.1.2.

Looking forward to further developments of the implementation approach and according to the lack of quantitative data, it is recommended to involve and train the stove producers in bookkeeping as well. They should be able to record the production and stove adoption within their impact area.

Moreover a participatory impact assessment with the respective training could be envisaged. The participation of commercial producers in the assessment of quantitative as well as qualitative impacts of their own activities is supposed to contribute to a better database and at the same time it has the potential to improve the quality of production. If the producers would know more about reasons for appreciation of their stoves or difficulties and problems⁸⁴, users experienced with stoves, they could try to modify their own production according to demand and recommendations, to satisfy their potential customers. They would also learn more about their target group, about the acceptance of their product and its distribution.⁸⁵

⁸⁴ Compare Advantages of stoves appreciated in Malawi, Individual Adoption, chap. 4.1.3.

⁸⁵ A similar cognition was obtained during the ProBEC impact questionnaire; compare Brinkmann & Klingshirn 2005.

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Annex

Annex 1 Questionnaire for the Assessment of ProBEC Impact

Name of seminar participant (interviewer): _____

Name of person interviewed: _____

Name of village and district: _____

Date of interview: _____

1. Stove usage:

1.1 How many improved stoves do you have? _____ Since when? _____

1.2 How often do you use your stove(s)? _____

1.3 Did you buy your stove? Build it yourself? Pay someone to build it for you?

If you paid, who gave the money for your stove? You other family members

1.4 Do you also use other stoves? Yes No

If yes, which type and for what purpose (space heating)? _____

1.5 What do you like most about your stove(s)? _____

2. Fuel usage:

2.1 What is the main fuel you use? Fuel wood Leaves/twigs Dung Kerosene
others : _____

2.2 Do you collect your fuel (wood)? Or do you buy it?

If you buy it, how do you pay for it (money or other goods)? _____

3. Economic impact:

3.1 If you buy your fuel, how much did you spend before / without a stove? _____

How much do you spend now with stove? _____

If any savings are made, what do you use the saved money for? _____

3.2 If you collect your fuel, how much time was spent on collection before? _____

How much time do you spend now with stove? _____

If any time is saved, for which other things do you use this time? _____

3.3 Do you make any money selling stoves? Yes No

If yes, how much is it per month? _____

3.4 Do you build stoves for others? Yes No

If yes, do you get paid for it (with money or in exchange of other things)? _____

How much per stove? _____ Which other things? _____

Who earns the money from building and selling stoves? You other family members



4. Social-cultural impacts:

4.1 Does your husband and your family appreciate that you have an energy-saving stove (and that you can save money or time with it)? What can you tell? _____

4.2 Do you get comments from neighbours? What do other people appreciate most of your stove? _____

Did other people get a new stove because you had one? Yes No

4.3 Is the amount of smoke more , the same or less than before using the new stove?

4.4 How is your health? Have you noticed any difference to before, when you did not have an improved stove? Yes No

If yes, what has changed? _____

(Have you heard people talking about coughing less? or about Malaria?)

4.5 How do you estimate the danger of the stove, did you hear about accidental burns? _____

5. Environmental impacts:

5.1 Do you see any environmental changes in your area during the last years? Yes No

If yes, what has changed? _____

5.2 Have you heard people talking about harvesting less, if they are burning the dung instead of leaving it on the fields as fertilizer? Yes No

If yes, what are people doing about it? _____

If you are burning dung, what are you doing about it? _____

5.3 Has the use of wood and deforestation increased during the last years? Yes No

If yes, what are you and other people doing about it? _____

5.4 Has the loss of soil (soil erosion) and soil degradation increased? Yes No

If yes, what are you and other people doing about it? _____

5.5 Do you think that there is a greater awareness these days about how the environment around you is changing? Yes No

If yes, do you talk with other people around you? _____

Do you discuss what you can do to improve it? _____

Thank you very much!!! ☀

Annex 2 Selection Criteria applied to the four Villages

Salamu, Ligomba, Njete and Matanya

1. Distribution of the villages within the impact area: according to group villages (GV) and traditional authorities (TA):
 - Salamu: GV Fundi, TA Nkanda
 - Ligomba: GV Abunu, TA Nthiramanja
 - Njete: GV Nthiramanja, TA Nthiramanja
 - Matanya: GV Kukada, TA Nkanda
2. Size of the village – from 100 to 500 households:
 - Salamu: 200 (in 2001) & 400 (in 2004)
 - Ligomba: 200 (in 2001) & 230 (in 2004)
 - Njete: 230 (in 2001) & 500 (in 2004)
 - Matanya: 110 (in 2001) & 100 (in 2004)
3. Leadership of the village – male or female chief
 - Salamu and Matanya: female chief
 - Ligomba and Njete: male chief
4. Duration of participation within the project:
 - Salamu: since 2000
 - Ligomba: since 1999
 - Njete: since 1997 – pilot village
 - Matanya: since 2001
5. Adoption of stoves – according to IFSP database from 2001
 - Salamu: 29%
 - Ligomba: 45%
 - Njete: 26%
 - Matanya: 38%
6. Commercial production:
 - Salamu: has kiln (but not yet ready and used); promoter participated in last production workshop
 - Ligomba: kiln not yet ready, but promoter participated in the workshop as well
 - Njete: no kiln, mainly promotion and grassroots' production
 - Matanya: no kiln, promotion, no commercial production
7. Connection to a kiln:
 - Salamu: own kiln, not finished
 - Ligomba: about 2 km to Likalawe, jointly using that kiln
 - Njete: no kiln in the neighbourhood
 - Matanya: about 1 km to Kambenje; not jointly using it
8. Distance to a market place or trading centre:
 - Salamu and Ligomba are far away from a trading centre
 - Njete is close to Chonde and Luchenza (about 4km) as trading centres
 - Matanya is very close to Kambenje (about 1km)
9. Distance from the mountain (main firewood source: close to the mountain, many people use it for collection of their firewood):
 - Salamu, Ligomba, Njete: far away from Mount
 - Matanya: close to Mount – people go there for firewood)

Annex 3 Interview Guideline for Stove Producers & Promoters

This interview guideline should be regarded as example. The guidelines for interviews with the Chief, Nduna and VDC or with Users, Ex-users and Non-users are following the same principle; just the focus is different. The interviews with Chiefs, Ndunas and VDC focussed on general village information as well as on support and involvement of the village leadership in stove implementation. The interviews with villagers, who were using or not using the energy saving stoves focussed on their experiences with stoves.

The interview was generally carried out open and as discussion, scheduled by the following questions. These were used as guides, but according to the flow of information, not strictly followed. This guideline is divided into general information, information about impacts and opinions and further suggestions. The background and interest of the respective question is easy to identify and highlighted in grey.

ProBEC Biomass Energy Conservation

Interview with Stove Producers & Promoters within Mulanje District – Malawi

A General information

1. General information about the interviewee

Interest:	General information about the person, the position within the village, the motivation, producing and promoting at the same time
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My introduction:

Presentation of my research:

The purpose of my visit:

Date of interview:

Place of interview:

Name of person interviewed:

How did you hear about the stove-project?

Are you a stove promoter? Commercial stove producer?

Since when are you a stove-promoter?

When did you start selling stoves?

What was your interest in promoting stoves? Or selling stoves?

What are you working besides stove-promotion?

Section & interest	Question	Answer	Comments & evaluation
2. Stove promotion	2.0 What type of stove do you promote? Which fuel is used? Are the stoves mentioned all in use? For what? How long is the lifespan of a stove? Where are the problems of replacement?		
<i>Correspondence of the amount of stoves mentioned with the existing and used stoves.</i>	2.1 Do you still motivate and train other people to build stoves? Are you promoting frequently? Are people paying or is it for free? How many people are coming to your training? How many did you train to build stoves? How many of them have build their stove afterwards?		
<i>IFSP-initial promoter or spontaneous promoter & Statements about quality of training & if the time of training is enough.</i>	2.2 Where did you get your promoter-training? When? How long did the training take? How many of those originally trained are still active? What did you learn there?		
<i>Promotion on demand or active dissemination? Means of communication used to reach the people, communication flow</i>	2.3 How do you reach the people in your village? Do you go to the people and inform them about training? Do they come to you and ask you for training? Was it easy to reach the people? Were certain groups easier to reach than others?		
<i>Training process; content of training; dissemination of knowledge of other promoters; check on kitchen management and observation whether practiced!</i>	2.4 Can you describe the training? Do you do cooking demonstrations? Do you know something about food-warmers? Do you promote them? Do you promote about alternative food like mixed flower-Ndzima? Do you know about household management? How do people react on this?		
<i>Cooperation with other promoters (household, forestry, GVH)</i>	2.5 Do you work together with household management or forestry promoter or on your own? Who are they? How are they working? Is there a cooperation with other stove promoters in your GV?		
<i>Dissemination</i>	2.6 How many families in your village are using the improved stoves at the moment?		

Section & interest	Question	Answer	Comments & evaluation
3. Stove production	3.0 What type of stove do you build?		
<i>Type of stoves built; dissemination of stoves, number of households being reached; way of dissemination</i>	3.1 How many improved stoves do you produce per week? Do you sell them yourself? Or are other people selling for you? Where do you sell the stoves? (at home, other villages, other markets) Where do your customers come from? (own village, other villages)		
<i>Marketing strategies; quality control; Check: whether measures are kept!</i>	3.2 What is a good stove for you? Which criteria must be fulfilled? Are there specific dimensions to be considered when building a stove? What do you use in order to assure the right dimensions of the stove? How do you assure the quality of your stoves?		
<i>Cooperation or competition between producers, conflicts;</i>	3.3 Are there other people in your village that produce stoves commercially?		
4. Social position of producer / promoter	4.0 Within your village, are you working in a group? In a committee? How is the group working? What motivates these people? What are they getting out of it?		
<i>On which conditions would the promoters be willing (and able) to continue with the work and to spread knowledge about stoves and kitchen management?</i>	4.1 What are your motivations to promote stoves? Would you continue doing this? Even if the project stops? Which would be circumstances to continue with the work you started? What would be the conditions?		
<i>Dynamics within the village</i>	4.2 How would you describe the situation within your village? What are the things you like about it? Can you also point out processes you do not like?		
<i>Changes of the position of promoter; popularity; appreciation Do invitations contribute to the long-term implementation of the project?</i>	4.3 Do a lot of people in the village know you as a stove-specialist? How was your last promoter meeting? Did you get positive responds? Are there also any negative responds, any problems or conflicts? Do you get invited by others to tell them about stoves and production? Do you get a lot of visitors from villagers?		
<i>Feedback to the promoter: contacts with users, person of confidence; changes of position and role of promoter within the community</i>	4.4 Do you sometimes talk with the people, you have trained or who bought your stoves? Do the users inform you about the handling of the stove? Do the stove users come to you if they have problems?		

Section & interest	Question	Answer	Comments & evaluation
5. Characterize the users	5.0 I observed, that there are some people using stoves, and some do not. What did you hear, why people are using stoves?		
<i>Positive and negative feedback;</i>	5.1 How would you generally describe your contact to the users? What are the people telling you? Did you hear any comments or critical remarks from your clients?		
<i>Difficulties to reach people; distrust or suspicion towards the stove; How do they encourage the people?</i>	5.2 Would you like more people to use stoves? Do you go to non-users to motivate them? What would you recommend others to distribute more stoves? How could you imagine to reach even more people?		
<i>Groups easy to reach Are others following the active villagers? Are they an example to others?</i>	5.3 Are there certain groups of people, which were easy to reach? Who were the first to use improved stoves and to take part in training? Are those already using a stove motivate others? Are they somehow a model?		

B Information about impacts

Section & interest	Question	Answer	Comments & evaluation
6. Economic impacts of stove production <i>Are women, who want a stove, getting the clay themselves? Are they preparing it themselves? How is the procedure?</i>	6.0 How do you get the clay? How much time do you spend? How often do you have to go? Are you collecting it yourself? Or pay s.o. else? Are there other people collecting clay? Are your trainees collecting and preparing clay before you train them?		
<i>Pressure on the clay-source; income generating; distance to clay source; reasonable pricing of stoves; (realization of the training);</i>	6.1 What does the production of stoves cost you? Production costs: Cost of clay, time for clay collection, time for moulding, firing costs, losses, storage costs, labour? Marketing costs: transportation, seller's time, storage, losses, promotion? Do you know the profit you make with the stoves?		
<i>Income</i>	6.2 How much money or other goods do you receive per stove?		

Section & interest	Question	Answer	Comments & evaluation
	Do you make different prices for different people? Do you get other goods in exchange for the stoves? How many stoves do you burn per month? How many of them have been broken?		
<i>Responsibility for the income; use of additional income</i>	6.3 Who gets the money you earn? Is your husband keeping it? What do you spend the additional money for? Who decides what to do with the money?		
<i>Economic position within the community</i>	6.4 Do the others in the village appreciate you for doing that job and having an income? How do they show it? How do you know?		
7. Social-cultural impacts	7.0 Does the chief support you? How? Does the chief's wife support you? Do you get any support from Ndunas or VDC?		
<i>Relations to the chief; councillors, VDC; relations within the family; different roles; appreciation by the husband/wife; relations within the community;</i>	7.1 What does your husband and your family say about your activities in promoting (and producing) improved stoves? How does your husband react to you earning money with stoves? Who is making decisions concerning household within your family? Was the decision making always like this?		
<i>Situation of education within the village</i>	7.2 How is the access to schools here? Do you have a school in your village? What are your children doing?		
<i>How is the work with the stoves affecting their other duties? Does the person get any support? Who is helping? Could she do/produce more if she would have more customers?</i>	7.3 Is there anything very interesting for you that we did not discuss? How about your other duties? How does the stove-promotion/production affect your other activities within household and family? Do you receive support from other family members – how?		

Section & interest	Question	Answer	Comments & evaluation
8. Environmental impacts <i>Changes concerning firewood collection? Environmental changes, personally and generally; use of wood and deforestation – afforestation and agroforestry</i>	8.0 How about the trees around your village? Do you see any changes before IFSP and now? What has changed? Has the use of wood and deforestation increased comparing before IFSP and now? Are there other users of firewood? (brick making, beer brewers, fire wood vendors) Are you doing something against it? Women or men?		
<i>Soil/soil erosion and degradation; application and realization of recommendations</i>	8.1 Has the loss of soil (soil erosion) and soil degradation increased? Do you need more fertilizers nowadays? What are you and other people doing? Men or women?		
<i>Responsibility for environmental conservation; environmental awareness</i>	8.2 Do you talk about changes to nature with other people in your village? Do you discuss what you can do to improve it? Are there any plans, what to do?		

C Opinions & suggestions

<i>Additional information; opening for questions and recommendations of the interviewee</i>	9. Who else would you suggest to interview?		
	10. Do you have any questions and recommendations? The project assumes that the stoves and the kitchen management can still be improved – for this, we depend on your feedback and the feedback of users! Could you make suggestions or did you hear any suggestions for improvements from other users, which you could forward? According to the questionnaires, which questions would you ask? Which questions are very important for you? What would you like to know?		

Annex 4 Performance of the different Villages before the Follow-up Visit

Salamu

The impression in Salamu was that they were about to fire the kiln for the first time, as they collected clay and built about 70 stoves. But to use the full capacity of the kiln, they need 120 to 150 stoves. This was the case since long time and the promoters seemed to have problems to finish the construction of the kiln. The second visit was supposed to show if more stoves were made, how the kiln was fired and how the stoves look like.

The villagers, especially the VDC members, were concerned about markets and marketing strategies for the stoves. This had to be discussed with the promoter, who learnt about marketing at the ProBEC workshop.

Ligomba

Several villagers in Ligomba were already using stoves – especially the Mbaulas – and they were producing very actively. The villagers wanted to build a kiln and fire it at the 28th August – which was the reason to visit them at that date and to attend that event. Even though some days in advance it seemed as if they failed to build the kiln, the visit had to be carried out at that day. Neither the EO nor the neighbouring producer was able to support them with the kiln construction.

The promoters also needed moulds for stoves and potrests, which were brought and provided by IFSP.

Njete

Njete was difficult to judge. On one hand it was a pilot village and known as well performing; on the other hand they were using few stoves and people were not trained by the promoters, instead they heard and learnt from their neighbours. This shows that promoters and villagers were not very cooperative. They were working very separated.

The promoters were asking for moulds for themselves and uniforms, which had to be discussed with IFSP staff. Moulds could not be provided in large number, therefore it would be better to get measurements from the EO and to identify a villager, who is a metal worker and could produce the mould himself. And the cloths were very costly and only distributed at the first training. They would have to find another identity to distinguish from others and to get recognised as promoters: a specific symbol or label e.g.

An interest was to see what especially these villagers, who were discussing a lot about impacts of stoves, would have done in the meantime.

Matanya

Very few stoves could be found in Matanya. All portable stoves got broken after some time and the ex-users failed to replace them, because they were not able to produce good quality stoves. The second visit was supposed to prove if technical improvements were made after sharing the latest ProBEC workshop information, if the clay was properly prepared and if better stoves were produced.

It should be followed up if and how they arranged an information exchange and meeting to jointly fire the kiln with Mrs. Sompho in Kambenje. She offered this cooperation and the stove committee of Matanya agreed, even though they had concerns before and felt uncomfortable sharing the kiln.

Annex 5 Village-Specific Impacts

The four villages are presented according to their specific situation and background, their stove adoption, impacts and the respective lessons learnt. This is deepening the overall findings about impacts of energy saving stoves⁸⁶.

5.1 Salamu Village

Salamu belongs to GV Fundi in TA Nkandla. The village joined the IFSP project and the BEC activities in 2000. It is one of the villages, where promoters wanted to start commercial production and built a kiln.

5.1.1 Assessment Activities in Salamu

The initial interview with the chief was joined by one of the stove promoters, because the chief was hardly informed about processes and activities in the village. Through the interview with three VDC members and the regular exchange with a stove promoter, it was however possible to grasp the village structure. Further group discussions with the stove committee gave an overview over stove related activities, stove adoption and implementation, and it revealed the relation between the different committees in this village. During further single interviews with the stove and household management promoters, the impacts of stoves and challenges were discussed more detailed and possible improvements were envisaged.

In meetings with two different user-groups – divided into two groups according to sections – and the visits to some non-users, impacts and changes related to the improved stoves were discussed.



Photo (vb): Salamu – stove committee-interview



Photo (vb): Salamu – interview with stove-users

Observations during the stay at the chief's compound, the invitations to VDC members and promoters as well as during walks through the village could support and extend the information received through the interviews.

5.1.2 General Village Information

In 2001 this village counted about 200 households. During the assessment in 2004, the number given by the VDC was app. 400 households (recorded according to a census, carried out in July 2004). The village was informally divided according to the different cultural and thus religious groups, the Romwe (Christians mainly) and the Yao (Muslims mainly), to which the chief's clan belongs. The Yao are known as very dominating and at the same time less open-minded and ignorant towards school education, whereas the Romwe are not so privileged, but very active within community management.

⁸⁶ Compare 4 Impacts of Improved Stoves.

The chief of Salamu is a woman, who is not active, in particular not in terms of stove implementation. She became a chief recently, two years ago, as the former chief had to be replaced due to corruption problems. As village leadership is inherited within one family, she was appointed to take over. She was not very open-minded, did not experience a lot of exchange with other people and thus she was not aware of processes in her own village.

She herself did not use a stove and was not able to provide information about stoves. Only one of her daughters started using a fixed stove some days ago. The former chief also did not support the introduction of stoves to the village; moreover he denied joining IFSP. Only the demand and pressure of some villagers made it possible to start. In 1999 GTZ introduced the improved cooking stove within their integrated IFSP approach to the village.

In opposite to that the village was known as well performing in terms of community management. The established committees were very active and cooperating. In 2001 they had established the livestock committee, health, home-based care, forestry, catchments area development committee (CADC) and the VDC. In 2004 they additionally mentioned the bee-keeping committee, orphan care, roads and stove committee. Especially the VDC, the central and coordinating committee, was quite active and meeting on a regular basis to sort out village development issues. The interaction between stove committee, VDC and the Nduna was empowering the activities of the promoters.

The stove committee had app. 13 members, including the stove, household management and forest promoters. Among the members some VDC members and the Nduna were represented as well. Many of them had been using stoves before; others just planned to build their first stove. According to the committee members, it has the purpose to train others, to build and sell stoves – but they were still at the beginning stage.

The sources of firewood and clay are scarce in this village. Even though it is far away from Mount Mulanje and there is no major firewood source, most of the fuel is collected. Only some families were growing their own trees or buy firewood.

It also was an effort to get and fetch clay at the main clay source, which is about 6 km far from the village. But at the second visit, the VDC explained to use a new source, which is about 2 km away.

5.1.3 Stove Promotion & Production

The stove and household management promoters were elected and trained in 1999/2000. The stove promoters are Grace Machinga and Ellen Magalosi; the household management promoters Sigeli Alan and Elida Sankhan. At a later stage, the forest promoter, Rosby Kaliandi, joined, but she was not actively working on stoves. In the beginning this group had problems to organise themselves. Due to the size of the village, they distributed the village among themselves into responsibility sections. Nowadays they occasionally work together.

In Salamu stove promotion was organised mainly demand-driven, but sometimes the promoters went from door to door to visit and motivate the households. Promotion especially took place in terms of stove and cooking demonstrations for the whole village or at the respective home of the family in case of fixed stoves. Instead of the chief's house, these demonstrations were held at Grace Machinga's home.

Since 2003 the promoters started stove production in larger scale, encouraged by other villages. Grace joint the latest ProBEC workshop in June/July 2004, where stove producers from 6 ProBEC countries exchanged their knowledge and experiences about commercial production. Therefore she was the main source of information and the one to train other promoters. She was the driving force for commercial production in Salamu. The kiln was placed at her house, but even though they started in 2003, it was still under construction and not yet thatched. Therefore the promoters did not yet sell stoves in large number. Only a few stoves had been sold at Grace's house. Regarding this set-up, the promoters still worked as promoters following the old approach rather than as commercial producers.

5.1.4 Stove Adoption

In 2001, the stove adoption in Salamu was about 29%⁸⁷. This demonstrates that 58 households were using one or more stoves. The main type used in Salamu was the portable Mbaula (96); the fixed one (4) was not very common. In 2004 app. 40 to 50 households, using an improved stove, could be identified (10 to 12,5%).

In Grace's section, most of the villagers adopted the portable, whereas in Ellen's section the women adopted the fixed stove. Most of the interviewed users were using their current stove since 2003/2004. This indicates that the lifespan of the stove built in Salamu was only about one year.

Despite all activities and good cooperation between committees and villagers, the promoters' efforts and the exemplary stove adoption of the Nduna and VDC members (even one man built a stove on his own), the stove implementation was very low in Salamu. The second visit after 5 weeks also did not show any differences. Only a few more stoves (about 5) could be found, the kiln was not ready – but the next stove demonstration was already planned.

The villagers, who did not use the stove, would have to get convinced and proved that the stove keeps its promises. Experiments and cooking demonstrations could already convince some suspicious villagers. But many were not able to change their old habits and according to the VDC for them it takes time to adopt these innovations. Further reasons, given by the stove committee, were general awareness about improved stoves, trust in new techniques and the affordability.

Those who got convinced saw the stoves at friends' or neighbours' homes and trusted them. Those villagers, who were anyway open-minded and active e.g. in other committees within the village, were comparatively easy to reach. They implemented household management knowledge. To improve the combustion, they cut and dried their firewood either behind the house or above the stove inside the kitchen.

5.1.5 Impacts

The villagers experienced different changes through the use and the production of energy saving stoves.

5.1.5.1 Impacts of Stove Use

The improved stove requires a little amount of firewood and thus less has to be bought and the families **save money**. With the 3-stone fire they spent 15 MK per day (some reported about 20 to 30 MK), whereas with the improved stove they spent about 10 MK on firewood per day. Per week they needed 100 to 150 MK before, whereas 50 to 70 MK with the new stove. Most of this saved money was spent on domestic purposes. In Grace's section of Salamu, the women kept this money, as decisions were made by both and finally both share the money. In Elle's section, the husband usually kept the money, but purchasing decisions were made by the women.

The stove-users experienced a relieved food preparation. The women had to stay at the 3-stone fire, because they had to keep the fire burning, and moreover an open fire is dangerous and could cause fire in the kitchen. With the improved stove, this problem was decreased. The women appreciated that the **stove is safer**. Even children and sometimes men were able to cook on the Mbaula, because it is **easier to handle**. Before the husbands would not have helped with cooking, washing or gardening. In particular cooking was an exhausting and dirty work – uncomfortable because of ashes, dust and smoke around. But the users of energy saving stoves experienced that **men appreciate** the modern stoves and their wife's activities. They were proud of them.

The main environmental impact recognised was the **conservation of forest**, which is rare in Salamu. The Nduna explained that fewer trees were cut down, due to decreased amounts of firewood needed. Additionally the villagers were given tree seedlings by GTZ, and thus together with the forest promoters they planted their own indigenous (or partly Bluegum and Kesha) trees.

⁸⁷ According to an IFSP database created from different district statistics in 2001. The figures were generated, comparing the frequency and probability of censuses, statistics of the health, water and agricultural sector and IFSP project data. Because of the lack of trustworthy statistics and a high range of false numbers, this database has to be regarded as probable direction rather than absolute and fixed figures.

To conserve these trees, the users were taught just to cut some branches instead of cutting the whole tree.

5.1.5.2 Impacts of Stove Production

Major economic benefits due to commercial production and stove marketing were not experienced so far. The promoters did not sell enough stoves to call it income generation and they even did not have an idea about pricing of stoves.

But the stove and household management promoters reported about social changes. They were **known and respected** by many people for their training activities and recommendations. They exchanged with stove-users, who again told neighbours in the next villages about the improved stoves. Neighbouring visitors came to ask for the promoters and their advice.

According to the VDC and a stove promoter, sometimes the **men supported the women** collecting clay. They carried the clay on their bicycles. The Nduna explained that some men built a stove as well or they were involved in the process of stove and kiln construction.

5.1.6 Lessons Learnt in Salamu Village

The impacts of improved stoves were quite clear to the villagers, even to the non-users. They appreciated the fixed stove for its durability and the Mbaula for its flexibility. But still many people seemed to have other priorities. To reach more households with energy saving stoves, the VDC recommended to transfer this issue into a drama, as this is a very common way to communicate challenging information.

At the same time the quality of stoves and household management techniques would have to be improved. Concerning the fixed stove, ventilation was often a serious problem. The smoke remained in the kitchen, because doors were too close to the next houses, openings were not at the top of the kitchen, too small or not at both sides of the gable. According to the stove committee the quality of stoves themselves, e.g. those built in June 2004, was questionable as well. Several problems caused the breaking of stoves: no decomposing and preparation of clay, no proper shape and measurements. Technical challenges were in particular the height between top and door, which should not be too small, and the shape and position of potrests. Therefore the committee was waiting for new information and updates from Grace, who attended the last ProBEC training.

At the beginning the stoves were moulded free hand with respective difficulties. Measures were taken with hands and rulers. Later on they tested a paddle mould, with the result that the walls were not equal. After some months, this paddle mould was replaced through a simpler mould – looking like a bucket without bottom – which proved to be very useful. Potrest moulds eased the construction of potrests as well. These tools could improve the equal shape of stoves.

In Salamu, Grace Machinga was the “key-promoter”. Even though the other promoters also had a good reputation as motivating and encouraging, Grace reported to work on her own often. The other promoters seemed to be busy with other things, and more especially the chief did not support the implementation of stoves. This could explain, why non or few stove related activities were carried out in the meantime between the first assessment and the second follow-up, and why the kiln was still not ready: the activities were not consequently carried out, coordinated or mandated by the chief. This might have been deteriorated through dividing the village and thus the target group into two sections, according to the two traditional and religious groups.

Nevertheless, the women who were involved in the use, promotion or production of improved stoves appeared as very open-minded. Some of the promoters were elected, as they were known as very active and trustworthy. They already had an important role in the village before, but furthermore the involvement in stove implementation even seemed to increase the position and respect of these women in the village. Via the stove committee, affiliated villagers were involved in the village development, respected and joined by VDC and Nduna.

In Salamu, the implementation of stoves started to open up the very defined work share between men and women. Men became involved in production and use of improved stoves and they even took over the responsibility for food preparation, if their wives were not present. Vice versa women and household issues – the former private area – became more public and relevant within the overall community development.

5.2 Ligomba Village

Ligomba belongs to GV Abunu, which is located within TA Mthiramanja. Ligomba is involved in the IFSP project since 1999. The promoters in this village started commercial production and built a kiln, similar to their neighbours in Likalawe, which was a pilot village and started commercial production very early.

5.2.1 Assessment Activities in Ligomba

General information about Ligomba village was collected through daily conversations with the chief and during the group interview with him and representatives of the VDC. A group discussion with the stove committee and interested villagers provided information about stove adoption, implementation and challenges. The interview with a stove promoter gave more detailed information about stove promotion and production. Visiting each stove-using household, joined by the chief and the stove promoter, a better insight into the users' experiences and their perspectives could be achieved. At the same time these visits motivated the users and challenged the non-users, realising that stove usage seems to rouse interest even from strangers. Many other villagers and neighbours came to the chief's place just to share their perceptions and to express their interests. Direct and participatory observation during the village walks, visits to households and especially during a joint stove and cooking demonstration at the chief's place allowed the verification of given information. It also made the promoters' work and the villagers' acceptance for household management and stoves visible.



Photos (vb): Ligomba – stove and cooking demonstration at the chief's house

5.2.2 General Village Information

Ligomba counted about 200 households in 2001, the latest figure referring to a census in 2002 was about 230 households. The VDC did not register the households and villagers. The major cultural group, to which the chief's family belongs as well, was Chewa (Christians mainly); the minority was Romwe and Yao. The chief received this position in 1982. Due to his good and positive manner of leadership, he was well established, respected and played a very central role in the village. Open-minded and inviting as he was, he was involved in the implementation of stoves since the beginning of the project.

The village's performance in community management was not known at that stage of assessment. The committees identified in 2001 were health, forest, CADC and the VDC. During the assessment in 2004 further committees were mentioned: the borehole, agriculture, school, roads and stove committee. But most of them were not visible as committees; respectively they did not carry out any activities. Instead, the chief was a driving force – taking over the responsibility to motivate and encourage. The committees were working very separately, as the VDC explained. They were active according to need and demand. The stove committee, as very active at that time, was an exception.

It counted about 10 members, composed of the stove and household management promoters and interested villagers. Most of them were members since 1999/2000 and started using stoves at that time. Nowadays many families used both, the portable and the fixed stove.

Ligomba is far away from the mountainous firewood source and they did not have a communal forest, where they could collect firewood. Some villagers planted trees around their houses (Bluegum mainly) and others bought the firewood from them or at the next market. A relief for stove production was the close connection to the clay source.

5.2.3 Stove Promotion & Production

There are five promoters in Ligomba, two for stoves (Agnes Mbawa and Elita Sabola, partly replaced by Elida Cosmas), two for household management (Mary Justin and Felicia Chimpeni) and one for forestry (Fanny Katunka), but their cooperation was questionable. Other villagers and the VDC characterised one household management and one stove promoter as very inert, whereas the other three stove and household management promoters were recognised as active and cooperative. A cooperation with the forest promoter did not exist.

In consultation with the chief, the promoters (with more or less consequent contribution) carried out stove and cooking demonstrations the chief's place and assisted other villagers to build stoves. The stove committee even had a program for its training. They planned to gather all villagers for the demonstrations and afterwards visit the households one by one to influence and to follow them up. Agnes Mbawa was visiting and training the women nearly every week during the dry season.

Agnes was very inspired and encouraged by the neighbouring stove producer Mrs. Nanjiwa's, when she saw the improved stoves for the first time at her home in Likalawe. Mrs. Nanjiwa was still advising Agnes and offered to jointly use her kiln to fire the stoves as long as Ligomba did not have its own kiln. Both Mrs. Nanjiwa and the chief supported commercial production in Ligomba and therefore Agnes to attend workshops and training on stove production. Together they attended the latest ProBEC training for commercial stove producers in June/July 2004, where Agnes learnt more about quality control, storage and preparation of clay, firing of stoves in a kiln and marketing.

The chief offered to locate the kiln at his compound, following the advise of Mrs. Nanjiwa and the EO. The advantage of the chief's place: it is traditionally a very central point in the village. In a very short time (of few months), the promoters of Ligomba with the support of some villagers started constructing this kiln. Before the first assessment visit they had built some bricks at the chief's place and a few weeks after the second visit the kiln was finished. In the meantime a large amount of about 60 stoves was built, especially by the promoters (Agnes made 27 for herself and 17 for other women and Mary built 17). At that time they had about 80 stoves and thus enough to fill and fired the kiln for the first time.

The prices for stoves changed a lot from 30 MK in the beginning (1999 to 2003) to 85 MK (2003 to 2004). Then after the last training (taking all production costs into consideration) and according to Likalawe, Agnes charged 120 MK per stove. It was mainly herself and Mary Justin, who transported stoves to the next market place in Chonde or to hospitals in Luchenza to sell them. Agnes transported three to four stoves at once and sold about 35 there.

5.2.4 Stove Adoption

The stove adoption in 2001 was app. 45%, which means out the 200 households, 75 were using a stove at that stage⁸⁸. In 2004 about 30% of the households were using the improved stoves – the fixed as well as the portable. The number decreased, because in the beginning villagers built the stoves on their own. The access was charge free. Later on several stoves broke and were not replaced. Nevertheless, some of the stoves produced in the first phase (from 1999 to 2001) were still in use, but the production was modified in the following phase from 2001 to 2004.

Even though the adoption rate in Ligomba was comparatively high, a number of households were not using the improved stove. The main reason was the breaking of stoves, due to lack of firing in the beginning. People lost interest, as the stoves did not last for a long time. Later on, when the stoves were fired in Mrs. Nanjiwa's kiln, this problem has decreased. As further reasons

⁸⁸ Compare IFSP database from 2001.

for not using a stove, the VDC assumed, lacking experience of firewood scarcity or enough own wood.

To reach more people, the promoters planned to visit each household, demonstrate the Mbaula and borrow it for some days of experimentation. The experiences should be reported afterwards. In Ligomba the chief's wife was giving a good example, using an energy saving stove regularly, as well as some members of the VDC respectively their wives. At the same time the women trusted Agnes and this made it easy to reach them. She was a very good example: even though she had problems with cracks in the beginning, she did not give up and since she experienced the new stove, she did not want to use the 3-stone fire any more. Other encouraged villagers followed their good examples, using and building stoves.

One stove-user even mentioned to recognise the energy saving stove at the IFSP stand on the Trade Fair in Blantyre in the previous year and became interested. But the majority of those, who used stoves, got convinced by the promoters, friends and neighbours. Especially the cooking demonstrations, comparing the 3-stone fire with the stove, proved that the improved stoves are saving firewood, convinced. Even more firewood could be saved with the food-warmer, which was recently introduced to the chief and Agnes, who wanted to present it to other villagers.

5.2.5 Impacts

Nearly everyone in the village knew the energy saving stoves and its impacts were very obvious for the villagers. Different impacts were seen concerning the use and the production of stoves.

5.2.5.1 Impacts of Stove Use

Foremost the users appreciated the aspect of **firewood saving**. The improved stove needs about half of the firewood compared to the 3-stone fire. The users experienced that the same amount of bought or collected firewood, is lasting for 4 days with the new stove, instead of 2 days with the 3-stone fire. The required amount of firewood decreased to about 50% and thus the money or time spent on fuel organisation.

The women also appreciated the **flexibility and improvement of cooking**, because they spend less time at the cooking pot. On the one hand they were able to cook several things at once, because the fixed stove often has two cooking places or else two portable Mbaulas were in use, whereas before they used only one 3-stone fire. On the other hand they were able to leave the stove alone for a while and do other things, due to the fact that cooking became safer as the fire is captured within this stove.

Another impact realised by the users was **more hygiene**. The food and the kitchen was cleaner, because there were less ashes, dust and smoke. And the pots were cleaner after cooking, as they did not take up much soot any more. All this was improving the food preparation and the health conditions within the families.

The users appreciated the **heating capacity** of the Mbaula. After cooking it retains the heat and can easily be carried to keep the house warm. Especially during the winter season, when the family otherwise would warm their bodies at the open fire, this became relevant.

From time to time some **visitors from outside** the village came to see Ligomba's improved cooking stoves. As they became interested, the women suggested appointments with the stove promoters. During the stove and cooking demonstration in July 2004 some neighbours came and observed the construction and use of energy saving stoves.

5.2.5.1 Impacts of Stove Production

The stove producers (mainly Agnes Mbawa and Mary Justin), who started producing in larger number, could already **generate some income** with stoves, selling them for about 85 MK, later on for 120 MK at the markets or at home. This additional money they kept on their own or sometimes jointly shared it with the husband. Agnes spent the money on cloths for herself and the children, books and school fees and for bags of maize.

Agnes reported that her **husband and children appreciate** her activities very much. The family supported her, so that she was able to join the ProBEC and IFSP workshops and to be absent for several days. Under these circumstances, her husband organised the household, he was cooking on the stove himself, washing and caring for the children. This was a new situation, as household issues were related to women in this village and he would not have done this before.

The promoters were **respected and trusted** very much by the other women. Thus their social positions within the village were improving, and at the same time their relations with the villagers were strengthened. An exception was the relation with the less active promoters. Jealousy of these promoters caused a lot of difficulties and pressure. They were not as competent and spread already false information about stoves and food-warmers.

5.2.6 Lessons Learnt in Ligomba Village

Stove production, promotion and use were very defined within the women's responsibility. Only women were involved in the project concerning stoves and became specialists in stove production and use. Therefore they were well respected in the village. Men supported the kiln construction, but else they kept out of the stove implementation. Considering this relation, it is even more impressive, that e.g. Agnes' husband supported her, took care of the household when there was a need and knew how to use the Mbaula and the fixed stove.

During the time of assessment the promoters were still following both approaches: training other women and cooperating with them for commercial production. Several interested villagers joined the promoters and wanted to sell stoves as well.

To ensure the quality of stoves, they modified the way of clay storage and preparation, which is crucial for the quality. In the beginning they left the clay decomposing for one week only. Now they first sorted out bigger stones and stamped the clay with their feed, then they put it into a hole in the ground for one week. After that they mixed it with sand if needed, stamped it again and put it into plastic bags for another two weeks. In the end they finally stamped and sorted it and then started producing. During this period of three to four weeks, the clay got very smooth. Keeping this procedure, the producers did not experience cracks any more, as they reported at the follow-up visit.

The other critical point of stove construction refers to the shape of stoves. Observations at the first visit proved that some doors were too big, others too small, some potrests were thin and flat, the height between door and top of the stove was small. But this had improved, since the promoters introduced moulds for the shape of stoves, the door cuttings and potrests. Measurements were kept; the remaining challenge was to adjust the potrests at the right place at the stove.

The promoters even tried to find reasonable solutions to use the improved stove for other purposes as well. For beer brewing and boiling water in very big pots, which do not fit on the stove, the villagers still needed the 3-stone fire. The promoters had the idea to create a bigger new stove with the same proportions and measurements, but according to the size of these particular pots.

During the assessment there was no marketing structure in the village, but as Ligomba has its own kiln, this would be an advertisement for stove sales. At the same time it would be regarded as a symbol for the development of this village. The stove committee planned to advertise additionally in three different villages and at main roads to attract more passer-bys. And because of the openness of chief, villagers and neighbours, which came and exchanged a lot, there is a big potential for expansion. Some neighbouring villagers already knew about stoves and some even used them. These should be targeted for the further implementation of stoves. At the follow-up visit two villages, Chikumbu and Pangani, were reported to start building stoves as well. They planned to jointly fire the kiln and firewood is already bought.

Despite all the advantages Ligomba received from Mrs. Nanjiwa, the village felt and appeared in the shadow of Likalawe. Therefore it would be wise – especially as they now have a kiln – to visit and exposure Ligomba more often to interested groups and to let them present their achievements as new commercial producers.

5.3 Njete Village

Njete – in GV and TA Nthiramanja – is one of the six IFSP pilot villages. Improved stoves were introduced in 1997, but during the last years the promotion and production of stoves decreased very much, and consequently Njete is not a place for commercial production of stoves.

5.3.1 Assessment Activities in Njete

In Njete, the chief and the councillor, Emanuel Louis, provided a lot of information during a first joint interview. A group discussion between VDC members, representatives of the stove committee and interested villagers, joined by chief and councillor, dealt with the contribution of stoves to poverty reduction. Interviews with the two stove promoters provided further information about stove adoption and production in Njete. In three group discussions in the different sections of the village, stove-users described the impacts of stoves, non-users explained their reasons and ex-users presented their concerns and bad experiences. These experiences were taken as examples to exchange possible solutions and improvements⁸⁹.

Walks through the village and visits to stove-users joined by the chief, the councillors and the stove promoter gave the opportunity to observe the usage of stoves and to crosscheck this with the received information.



Photo (vb): Njete – group discussion with VDC & stove committee



Photo (vb): Njete – stove-user

5.3.2 General Village Information

In 2001 Njete was a village of app. 230 households, whereas in 2004 during the assessment, about 500 households were mentioned. The village was divided into five different sections: Njete Centre, Nthuli, Likonyowela, Mbladji and Chewoka. Each section had its own organisational structure and Nduna. The major traditional group in Njete were the Yao (Moslems most of them) and some Romwe (Christians mainly). The chief, himself a Yao, was comparatively young (44 years), intelligent and a strong character. The organisation and government of this village was very centralised to his person, he did not have a vice person, but five Ndunas according to the sections of the village.

The village was very open-minded towards alternatives concerning cultivating mixed crops, agroforestry, manure application, bee keeping or seed multiplication. It was regarded as well performing in terms of community management. In 2001 it had a livestock, health and forestry committee, the CADC and VDC. In 2004 additionally they mentioned a road, a funeral, a borehole and the stove committee. The VDC was regularly linking up with the GV development committee (GVDC) and the area development committee (ADC). However, the activity of the stove committee was uncertain, as it did not seem to be active any more.

⁸⁹ Compare Individual Adoption, chap. 4.1.3.

Several firewood sources were available within the village. Some villagers collected the firewood in the forests; others grew their own trees, as they were given Bluegum and Kesha seedlings for the adoption of stoves in the beginning of the project. Many villagers bought the wood and paid around 105 MK per week or 15 MK per day. And there were two clay sources; one close to Chonde – one-hour walk to get there – and the other one close to the village near the wetlands.

5.3.3 Stove Promotion & Production

There are five promoters in the village – two stove (Akuziwona Tambuli and Tiwopane Ndwala) supported by a potter, two household management (Annie Makiyi and Esna Ditigoli) and one forest promoter. These promoters were only cooperating during the stove and cooking demonstrations, otherwise each of them was working alone. The stove promoters did not train about household management and vice versa, but the household management promoters were not in action during the visits and did not seem to be active.

As Njete was a pilot village, they started with the first type of portable stoves (without the bottom) and after 2000 they were introduced the new improved style. They built good fixed mud stoves once, but the promoters were not actively promoting stoves any more. Initially they invited for stove and cooking demonstrations at the chief's house, but this seemed to occur very seldom, as only two demonstrations in 2000 and 2001 were carried out. Later on they only trained on demand, if someone asked for support. Apparently one stove promoter (Akuziwona Tambuli) was more active, as she had good contact with women in her section, but there was no exchange with the users. The other promoter was less active, did not keep contacts and did not train for free any more since 2003. The activity of the promoters could be reflected in the number of stoves used in the respective sections.

Even though one stove promoter expressed to produce for others, she did not sell much. The shape and prices were varying, as she explained to sell for 60 to 90 MK according to the size of stove. Moreover she did not sell to her own villagers, but to neighbours passing by. At the time of the assessment she was not able to produce, because her house broke down. Summarising, commercial production did not exist in Njete, even though they heard about and wanted to have a kiln, thinking that this would ease the stove adoption.

5.3.4 Stove Adoption

Even though Njete was one of the first project villages and once a best practice example, it already in 2001 deteriorated. Stove adoption in 2001 was about 26%, 59 out of 230 households were using the improved stoves and the majority was using fixed stoves (53) compared with portable stove (35)⁹⁰. During the impact assessment in 2004, only a few stove-users could be identified, about 47 households, round about 10% of the 500 households. They were mainly using fixed stoves, which were very old and partly damaged. Those who built portable Mbaulas saw them or learnt about the construction from neighbours rather than the promoters. The motivation in general was very low, and as the promoters were mainly teaching and supporting on demand, the whole promotion got stuck in Njete. The second visit proved this, as nothing happened, no more activities, training or stoves were built.

Nevertheless, the chief tried to motivate other villagers by using several stoves within his own family since the very beginning. He even used to cook on the stove himself. He was joining the village assessment, talking to non-users, explaining them the stoves, their advantages and the responsibility of the promoters. In this way he tried to encourage and force the villagers to adopt a stove as well.

The stove committee assumed different reasons for not adopting a stove. First of all they recognised lacking awareness about the stove and its impact. Villagers did not see the use and advantages and they did not know how to build it. Moreover some villagers even refused to use the stove and explained not being able to cook on them. Others did not want to get in contact with stoves and the promoters, unless they get them for free.

⁹⁰ Compare the IFSP database of 2001.

5.3.5 Impacts

The few women, who adopted the improved stoves, experienced several impacts through the use of stoves. First of all they **save firewood** and thus **save money**, as most of the villagers bought firewood. For them it was even **cheap to build a stove** as the required material was found locally. They also recognised **less smoke** around the cooking place and appreciated the stove's **heating capacity**.

During the assessment session with chief, Nduas, VDC, some representative of the stove committee and interested villagers, the village's poverty related challenges and indicators were confronted with the benefits of improved stoves. This led to the contribution of stoves towards poverty reduction in the village. As indicators for poverty the group mentioned bad housing quality, not enough food, bad clothes, no money and many orphans due to HIV/Aids.

Several aspects of contribution were identified. If they would have to buy less firewood, they could save money for other duties and time to care for orphans. They could generate income with the stoves and use this money for housing and better clothes. The houses would not get damaged, because of safety improvements through the stove. Following household management, the kitchen would be cleaner and the equipment improved. The variety of crops would increase and more food would be available.

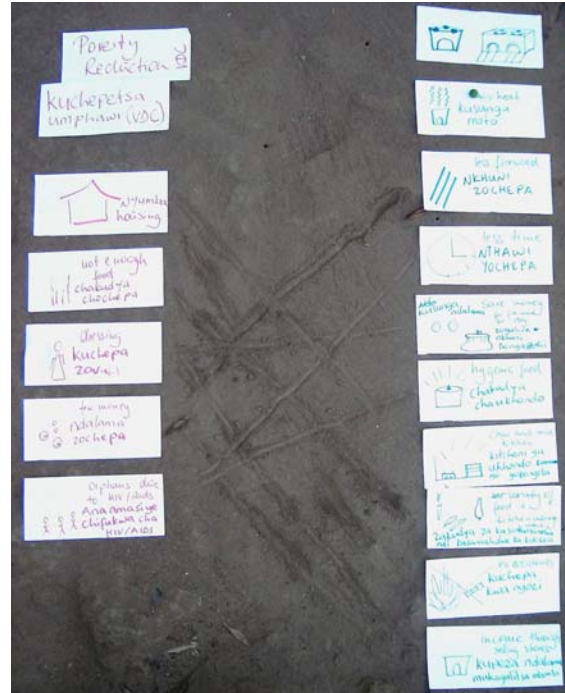


Photo (vb): How stoves contribute to poverty reduction

5.3.6 Lessons Learnt in Njete Village

The quality of stoves was questionable as seen during the observations. The clay was neither of good quality nor properly prepared. The shape of stoves was very different and the walls were partly very thin. Finally they were not fired and not resistant against rain and other influences. Therefore the lifespan was short and most of the stoves got easily broken. Those, who experienced breaking several times got disappointed and discouraged to build new ones.

Despite the findings of the poverty reduction exercise, the village did not implement stoves in large scale. This could be related to the poor quality of stoves and the promoters' attitude, only working demand-driven and not proactively. The cooperation between the promoters and their contacts with the villagers were missing as well. At the same time the villagers were not convinced about the stoves' advantages and refused the adoption. The promoters expressed their difficulties to reach these villagers, but did not put efforts into promotion.

Not even the support of the chief, who – as a central person – gave instructions and encourages the use of stoves, made any difference. He gives a good example himself, but nonetheless the stove adoption was low.

According to one promoter, the women were not supported by their husbands. Men were not involved in stove construction, household issues and cooking. In this case the chief was an exception, as he expressed to cook himself and support his wife. The chief and the councillor seemed to promote "gender-balance" and explained it as "men should help their wives". Another explanation was the exchange of work and responsibilities, which includes cooking and looking after children when the wives are absent. Another villager said that women should e.g. not sit on the ground, while men are sitting on chairs: "women are not born to sit on the ground or to be the only ones, who cook".

These expressions are very interesting, taking into consideration that the work share is still very specified within the gender relations in Mulanje district. At the same time women seemed to be used to and supporting this old relations and traditions and could not change easily.

5.4 Matanya Village

Matanya belongs to GV Kukada, which is in TA Nkanda. It is one of the villages, which recently joined the project in 2000. Stove production and implementation was still very low, even though it is neighbouring the pilot village Kambenje, where commercial production is already established.

5.4.1 Assessment Activities in Matanya

The general village information was collected through a joint interview with the chief and a representative of the VDC. More specific information about stove adoption and implementation was generated through a group discussion with the stove committee joined by interested villagers and another interview with the two stove promoters. Due to the small size of the village, it was possible to visit single households, to get an insight into users' or non-users' kitchens. The users provided information about benefits and problems, while the quality of stoves could be observed, to draw own conclusions about the implementation of stoves.

Further direct and participatory observation could verify the information received through interviews and discussions. During the walks through the village together with chief, stove or household management promoter, the stay at the chief's house, and more especially during the joint clay collection and the joint stove demonstration afterwards, additional information about relationships, challenges and stove implementation was gained, which allows to crosscheck with the other oral information.



Photo (vb): Matanya – joint clay collection



Photo (vb): Matanya – joint stove production

5.4.2 General Village Information

The village is very small, its number of households ranged at about 110 in 2001 and 100 households in 2004 according to the chief. The majority in Matanya were women. According to the VDC chairman this also refers to the matrilineal system: young men from Matanya had to move to their wife's villages, and other men were not attracted to marry into this village, as it's land-size is very small. Additionally many men had passed away. The problem of this distribution was the workload, which is burdened on women mainly. Also the chief of Matanya is a woman, young and very open-minded. She was chief since 5 years and received fair support from her husband.

The performance in terms of community management was not well known. The village had many committees: water, forest, health, borehole, manure, family planning, beekeeping, home based care, irrigation, fertilizer and hygiene committee, a stove committee and the VDC as well. The stove committee had about 10 members and its purpose was to motivate villagers and to teach them about stove production and stove maintenance. The responsible EO recommended this village as a best practice case within his impact area concerning stove promotion.

This village is directly connected to Mount Mulanje, the largest firewood source within the district. Most of the villagers – mainly women and children – went to the mountain to collect firewood, where they paid an entrance fee of 15 MK; thereafter they could collect as much as they were able to carry. Firewood collection could take about 8 hours, including 3 hours per way. The

women used to go twice or thrice a week. Only a few had own trees, if they had enough space and water – but those were still too young to use. Others collected the wood and twigs at paths and small forests. Very few were able to buy the firewood at the next market in Kambenje, where they had to pay 15 MK for a small package.

The clay source was in walking distance of about an hour. This source was huge and used since generations. The potters knew about it and the quality of this clay was generally good.

5.4.3 Stove Promotion & Production

After the IFSP project introduced the energy saving stoves to the village and chief as well as VDC appreciated this innovation – especially for its potential to save firewood – the promoters were elected by the villagers. The stove promoters are Dorothy Namalila and Messy Biliwat, the household management promoters are Mary Giza and Effeo Malunda and one forest promoter. They were working together and cooperated within the stove committee, but also in general and with interested villagers.

Despite these apparently good working conditions, stove promotion in Matanya was not successful in the last years. The chief invited everyone to her house – men and women – to collect clay together, to build stoves and to use them. Many people joined (app. 30 at the last meeting) and even the men came to observe. Together they tried to make portable stoves, but usually failed for different reasons. The clay was not well prepared and decomposed, the stove production was interrupted by other events and the raw stoves were not covered or kept in a shelter. Other stoves got broken, as they were not or just simply fired in a pit. They could not sustain rain or rough handling. After the assessment visits the villagers planned to jointly use the kiln in Kambenje. Initially they wanted to have their own kiln, but until they did not produce commercially, it would be too expensive for them.

The promoters of Matanya did not join the latest training workshops and thus the latest information and know-how about the right shape and measurements was not spread to Matanya. One promoter, Dorothy Namalila, was a potter and comparatively skilled, but she also had difficulties with preparation, construction and firing. Both stove promoters had the impression that they lack specific promotion training, but they also did not share information with the neighbouring stove producer in Kambenje.

Dorothy Namalila was the only one, who produced some stoves for others, of which she sold 3 to visitors, 2 to hospitals, 1 to a teacher and 2 to some Germans. According to the stove committee the villagers in Matanya would not buy stoves, because they think, they know how to build them themselves. They only saw purchasing power with visitors or neighbours.

5.4.4 Stove Adoption

40 households out of 110 were using stoves in 2001⁹¹, which is 38%. In 2004 there were much less stove-users (15 households or about 17%), as many stoves got old, broken or damaged during the years. The women explained to prefer the fixed rather than the portable stove.

Many villagers joined in the beginning, as it was exciting and they could build stoves on their own, free of charge. The Mbaulas lasted for 1 to 2 years, if they were well treated. The fixed stoves had to be smeared over and over again to maintain them. But when they broke – mostly due to rain – nobody was able to replace them. Moreover, those who tried did not succeed. E.g. the previous stove and cooking demonstration did not bring about more stoves as the work was not finished, the stoves broke and the promoters were not able to teach the latest improvements concerning stove production.

The chief used to have a stove before, but since she moved, she first wanted to finish the new house and the kitchen, before getting a new stove. At the second visit, her kitchen was nearly finished. Many other villagers also expressed their interest to build new stoves – the fixed as well as the portable.

⁹¹ Compare the IFSP database of 2001.

5.4.5 Impacts

The villagers experienced to use **less firewood** with the stove. The collected fuel remained for a longer period of time, so that they had to go less often these far distances for collection. They were still using the mountain forest as source, but only once a week.

Women were often **sharing stoves**. It seemed to be quite common that several women living within one family or on one compound shared the stove (fixed or portable), so that not every woman had to build her own stove.

Some **men were involved** in stove implementation and cooking as well. They did not refuse to take over the household activities from the women, when those were not at home. Men were very open-minded in Matanya and did not separate themselves from women; instead they supported the stove promoters and users.

Some women **improved their kitchen** with shelves to keep the food and pots clean. They built a chair in front of the stove to sit while cooking.

5.4.6 Lessons Learnt in Matanya Village

The problem of quality in terms of cracks and short lifespan of stoves was the major challenge in Matanya. This referred to the lack of clay decomposing and storage, unskilled stove construction and lacking proper firing (right temperature and speed). The aspect of preparing, sorting, stamping and decomposing clay was discussed during the joint stove demonstration, where the women were given information from the latest IFSP training. They went through the process of sorting and stamping, while they already experienced that the quality of clay improved and moulding became easier.

The villagers expected to improve the stove's quality mainly through firing in a kiln, but instead of sharing the kiln with Mrs. Sompho from Kambenje, they wanted their own kiln. They did not feel comfortable depending on her and putting organisational efforts into the cooperation. However during a joint visit to Mrs. Sompho, she suggested to cooperate and share the kiln. An improvement in terms of agreement and appointment between the two villages and their promoters, to support each other, was achieved. The women from Matanya agreed to get the measurements from Mrs Sompho and to share the kiln for a first joint firing, for which they are supposed to bring firewood.

Besides those technical challenges, there was no willingness among the villagers to buy stoves, because everybody assumed to know, how to build a stove and regarded stove production as something everybody could do. The value of a well-constructed and fired stove was not considered. Therefore it requires awareness rising about the quality of stoves.

Even though the stove adoption was low at that time, there seemed to be a potential in Matanya. The village is small, and villagers were well cooperating with the promoters. There was a good spirit and an interest among the women and moreover the young chief was very open-minded for stove implementation. Men seemed to support the women in their activities. There was one man joining the stove committee once, but as he got married he moved to another village. But the other men, who joined the demonstrations and cooked on the improved stoves, were encouraging their wives.

This potential was also expressed in the number and quality of stoves, built between the assessment and the follow-up visit. After sharing the latest information about clay preparation and stove construction, seven women, foremost the promoters built about 10 new stoves in only two weeks time. The clay was prepared more carefully. The quality of these stoves was much better and none of them got cracks. Moreover they already made an appointment with Mrs. Sompho to share innovations and to fire the kiln together.