

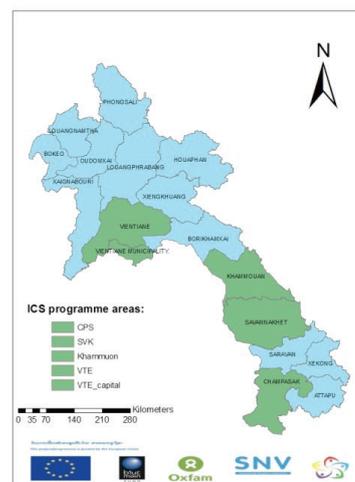
A RECIPE FOR SUCCESS IN THE DISSEMINATION OF IMPROVED COOKSTOVES - A CASE STUDY FROM LAO PDR

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Country: Lao PDR
Sector: Renewable Energy

Introduction

This case study outlines insights gained in Lao PDR by a programme initiated in 2010 by SNV that works in close collaboration with Oxfam and the local NGO ARMI. Switch Asia of the European Union and the Blue Moon Fund finance the programme. The example of Lao PDR is to support discussions around success factors of implementation strategies to increase the uptake of improved stoves in developing countries and bring solutions to scale. The case of Laos shows that the stove market can flourish and that by a well-balanced intervention strategy a win-win situation can be established.

Programme Areas:
Improved Cook Stove Programme in Lao PDR



The global picture

As a pivotal activity in all societies across the globe, cooking remains an area in need of significant improvement in view of social and economic development, natural resource conservation and climate change mitigation. Today, 2.5 billion people still rely on solid fuels and traditional stoves for cooking, causing negative and harmful impacts at multiple levels.

Stimulated by the oil shock in the 1980's and a growing concern around the depletion of natural resources, countless improved cookstoves (ICS) initiatives have been launched ever since. However, many have failed due to inappropriate technologies, unbalanced subsidies and insufficient attention to users' cooking habits and preferences. The widespread lack of success shows a notable 'cookstove fatigue', among donors.

After these experiences, and because cooking is considered a private affair, hidden away from the public arena, and because of the cross-cutting across sectors, it often fails to get a firm place in national and international policies.

Fortunately, new developments are giving a boost to the cookstove sector. For instance, the Global Alliance for Clean Cookstoves was created in 2010 to revitalise the discourse around stoves and health, and the United Nations declared 2014-2024 as the Decade of Sustainable Energy for All, including energy for cooking.

CONTEXT

CLIENT

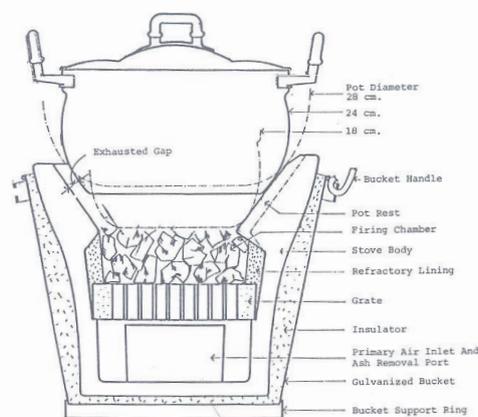
Lao PDR

Lao PDR is a vast country with a population of just 7 million, leaving 1 km² for 26 people (against 262 in neighbouring Vietnam). Its economy is reliant on the exploitation of its natural resources through mining, logging and hydroelectricity. The latter enabled the expansion of an electricity grid that goes far in the rural areas. With a 7% growth rate, the country is on the way to level up from its 'Least Development Country' status.

The rural and urban population in Lao depends primarily on wood and charcoal for their cooking needs. Biomass accounts for almost 70% of the nation's overall energy consumption¹, resulting in high external costs, environmental degradation, and 2,600 annual deaths from air pollution.

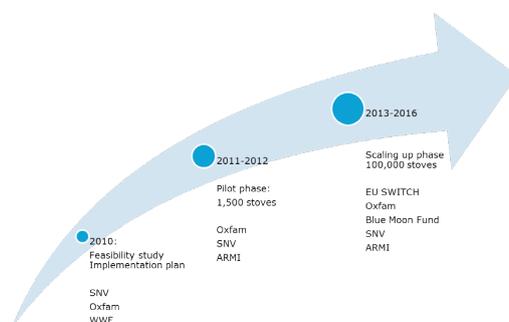
In 2011, the Ministry of Energy and Mines issued a Renewable Energy Strategy intending to make 30% of the country's energy sources renewable by 2025. Chief priorities however include biofuels, small hydroelectricity and biomass.² The Ministry of Environment mentions the development of stoves in its Strategy on Climate Change.

The improved cookstove type available in Lao PDR is closely based on the design that was first developed in Thailand over 25 years ago with the assistance of USAID. The improved cookstove was termed the Improved Charcoal Bucket Stove (ICBS). In 1997, the FAO funded a programme to introduce the ICBS from Thailand. This was implemented jointly by the Thai Department for Alternative Energy Development (DEDE) and Participatory Development Training Center (PADETC) - a Lao NGO. They trained 10 people in Laos to produce the ICBS. In 2003 PADETC conducted some further training and promotion activities in one southern province. Ever since the stoves are still in the market and considered better than most, however they do suffer from severe design drift which is driven by unhealthy price competition, lack of regulations and means to elevate the quality of the stoves from the average.



The Improved Cookstove Programme

A feasibility study conducted by SNV, Oxfam and WWF back in 2010 made clear that overall people were not satisfied with their cookstove. It broke down too easily, consumed too much fuel and was not convenient. At the same time the supply side was hampered by price competition and lack of standards and testing capabilities. With this as the fundamental problem in mind, a strategy was formulated to develop a value chain for long lasting, fuel efficient and convenient cookstoves for wood and charcoal.



¹ Renewable Energy Development Strategy in Lao PDR, 2011
² Ibid 4.

During the two first pilot years (2011-2012) the programme focused on capacity development of project staff and established linkages with stakeholders, one priority being the abilities of stove testing. It tapped into different national and international expertise, and adopted a 'learning by doing' approach. Through R&D and trial and error, a truly improved stove design was developed and also a series of assumptions were validated around adoption, actual usage, fuel savings, and marketability and profitability. The current upscaling period (2013-2017) aims to upscale the market for ICS. As of now the programme offers two models of charcoal stoves, the one for wood is still in its prototype phase.

The overall objective of the Improved Cook Stoves (ICS) project phase 2013-2017, financed by EU Switch Asia, is to contribute towards poverty alleviation in Lao PDR through the development of a sustainable consumption and production chain of fuel efficient ICS which will reduce the use of wood and charcoal and lower greenhouse gas emission.

The key specific objectives 2013-2017 include:

1. 15 producers sustainably produce 100,000 ICS
2. 150 SME retailers successfully promote the ICS
3. Lao Women's Union assumes its role as promotional partner
4. Five testing agencies are operational
5. National standard of stoves is endorsed
6. Multi-stakeholder partnership establishment

Achievements as per December 2014 are as follows:

1. 16 producers are actively producing ICS
2. 375 retailers are selling ICS in their small shops
3. The Lao Women Union conducted 26 demonstration workshops
4. The Ministry of Science and technology operates three test labs
5. National standards are under preparation
6. Multi stakeholder meeting conducted twice a year

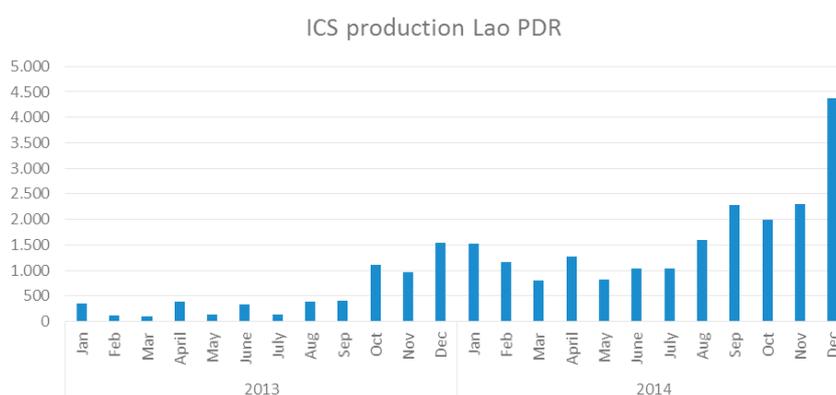
This programme is one of the few initiatives in the Mekong subregion that aims at mass dissemination and uptake of improved cookstoves. It adheres to a solid monitoring system that follows internationally recognised quality standards. This permits verifiable claims on both the side social impact and on greenhouse gas reductions. In partnership with Nexus for Development, Gold Standard voluntary carbon is being developed to open up revenues after this phase will end.



The ICS programme is executed by the Lao Non Profit Association ARMI with advisory support from SNV, and financial support from Switch Asia of the European Union Oxfam and Blue Moon Fund.

The market development of stove dissemination is demonstrated in the bar diagramme below, and shows a steady increase over time. Over the last two years 26,169 stoves were produced by 16 producers in four provinces and sold by over 375 retailers.

The label of the stove is recognizable by the superman character with the happy face. A market bureau made the design.



The value chain approach

The programme follows **an integrated market based approach building upon existing competence** and taking into account each potential added function in the value chain. The public sector oversees social promotion and consumer outreach as well as the implementation of national quality standards. Civil society organisations provide technical and managerial support while participating in awareness creation on cooking and fuel use; private sector partners (producers and retailers) serve as key drivers of the production and supply chains. By involving all stakeholders in the value chain, the programme will ensure complementary and mutually reinforcing activities that lead to: i) enhanced production in both quality and quantity, ensuring cost efficiency and availability; ii) improved marketing that continually produces demand; and iii) increased consumer awareness of the ICS' advantages.

Besides the creation of a multi-stakeholder PPP that will enable a large geographical scale-up and strive to improve the ICS value chain on multiple levels, the ICS programme **promotes replication** by building upon previous initiatives in Lao and similar programmes in the region and worldwide. It uses an ICS design close to the one successfully disseminated in Thailand, and builds upon the experience of GERES, which has disseminated 2 million similar stoves in Cambodia. Links are also being developed with a financial institution in order to provide credit to producers as may be required once production increases.

A strong emphasis is placed on **engaging with policy makers**, including the Lao Women's Union, a nation-wide and government-supported organisation that is engaged in promoting gender equality issues and is willing to support awareness creation for ICS. The Ministry of Science and Technology is also willing to help develop and enforce quality assurance. The programme further links up with the Clean Stoves Initiative run by the World Bank and has established an Inter-ministerial Task Force for Clean Cookstoves. Producers will be guided to set up an association with a mandate to agree internally on price and quality standards, to lobby for favourable stove policies and launch mass media campaigns under one brand name.

As far as **financial sustainability** is concerned, the feasibility study showed that the programme is intervening in an existing market. In order to prevent any disturbances, it refrains from any form of direct subsidies on the introduced stoves, or from imposing prices that may hamper uptake of ICS and sound profit margins. However, to mitigate the risk of unhealthy price competition, producers and retailers adhere to a minimum price. To finance the hidden costs that are presently not being charged, e.g. promotion, training, monitoring, etc., the programme is pursuing a combination of options, including public finance, carbon finance and a surcharge imposed on ICS under a franchise model where producers/retailers can use a logo that will guarantee certain quality standards.

The Lao kitchen

As in many countries, the fuel mix used in Lao kitchens consists of a variety of sources primarily comprised of biomass, wood and charcoal; agricultural residues, and LPG, electricity and biogas are used to a lesser extent. Charcoal prevails in 88% of kitchens in the intervention area, with an average monthly consumption of 40kg, against some 10 USD/month. Wood is used in 48% of households and with a large variation this is in the range of 150 kg/month. Wood is normally collected rather than purchased, a task that requires 13.5 to 16 hours per month.³ Availability and affordability of wood and charcoal are highly variable. Charcoal is the preferred fuel for several speciality meals, and is therefore used regardless of the availability of clean cooking options, even in higher end households.

Stove testing

In line with its focus on institutionalisation and capacity building, the programme invested heavily in training for stove testing, provided with the support of international experts like GERES and Aprovecho, and offered to project staff and officers from the Ministry of Science and Technology. They are now successfully operating three test labs across the country. The tests performed evaluate the fuel savings realised by the introduced ICS compared to various stoves commonly seen on the market:



Name	Improved Cookstove	Tao Payat	Tao Dam	Tao Cement
Efficiency	39%	32%	28%	24%
Estimated savings	N/A	18%	28%	39%

Figure 3. Comparison of the fuel efficiency of several stoves on the Lao market

As outlined in the table above, an improved version of the Tao Payat stove has the potential to save 18-39% fuel, depending on what stove was used before.

Experience thus far shows that even when distributed at a higher price (USD 5 versus USD 3.5), higher quality stoves with reduced fuel consumption and a longer lifetime are still in high demand. Combining those two pieces of information, an intervention in the cook stove value chain was clearly justified.

Users' satisfaction

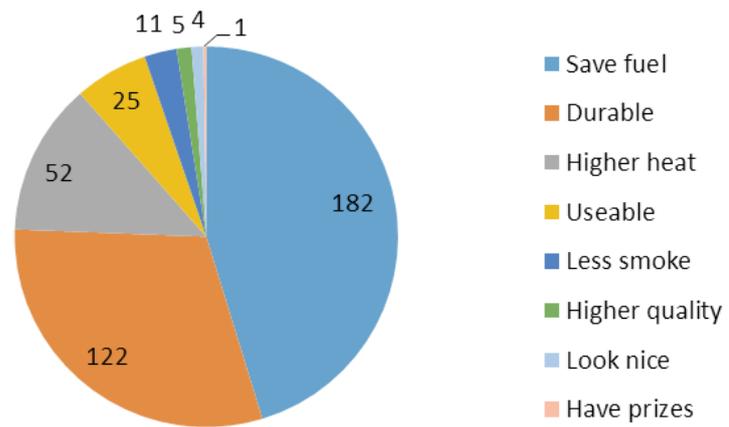
Besides the test results on efficiency and emissions, user perception is the key driver to ensure sales. In 2012 a survey was conducted among 293 baseline-stove users. The survey showed that only 36% of the respondents were satisfied with their baseline Tao Payat stove, people expressed concerns especially about quality and fuel consumption. Most stoves according to the respondents last for a month only before it cracks, which is often the grate.

On the other hand a telephone survey in 2013 among 270 ICS users showed 95% satisfaction (after one year of use) and a similar survey took place in 2014 with equal levels of satisfaction.

Reasons of satisfaction are described in the pie diagramme below:

OUTCOMES

³ Project Implementation Plan (J. Steel and Inthavong, S, 2010), Baseline Survey: Improved Cook Stove Programme Lao PDR, (University Amsterdam Institute for Environmental Studies, 2012).



Supply side interventions

Before initiating any capacity building intervention, the programme also invested important resources in understanding the operation and management capacity of existing producers. The producers selected through a public call for interest received extensive training and coaching support from the ICS staff. As indicated below, recipients could perceive substantial benefits arising from their training:

Item	Before	After
Training period	Start on yourself	Producers received expert and peer training
Coaching	No external support	Ongoing visits & support from programme staff
Moulds	No standard mould	Use of standardized moulds
Grate	Different shapes, grate easiest part to break	One standardized, thick design.
Quality control	Absent	Quality control and assurance
Business plan	Absent/fragmented	Plans help access to finance
Monitoring	Absent/fragmented	Stoves recorded by serial number
Labelling	Absent	Bleu label with unique serial number give customer confidence, brand product
Certification	Absent	Certification of producers 'earning' blue label
Access to finance	Moderate	Access to take loans (5 loans provided thus far)

Most importantly, producers appeared better aware of quality standards and potential profit margins to be made as a result of their training.

No subsidies are offered for producing ICS, but the programme encourages producers to invest in equipment and workshop improvements by taking up to a maximum of 50% of the costs. In most cases, an investment of USD 3,000-10,000 is required, demanding a contribution of USD 1,500 from both parties. Producers can take a loan from the national bank like ACLEDA with the support of the project staff that guides the decision making process.

In the near future, the programme will support the creation of an **association of ICS producers** that will be able to self-impose quality standards and lobby for a more favourable environment, including minimum prizes, greater access to finance, and strong linkages between producers and retailers.

The programme also focused on investigating available **retailer networks**; stove sales and prices. 375 retail shops were identified in three provinces, which are owned by women, selling an average of 20 units per month for a price around USD 5 per stove, including a margin of USD 1. A similar but smaller stove retails for USD 4 and with a similar margin.

The label is recognised as an important asset as far as sales were concerned, with customers being unable to differentiate between stoves.

Having examined the efforts pursued in Laos, it is possible to highlight some important lessons regarding the factors determining the level of success and of failure of ICS programmes worldwide.

Recipe for success

A cookstove is a seemingly simple technology embedded in a complex physical and social environment; its performance and impact depend on many different factors. Of primary concern in any ICS initiative is to ensure that focus is effectively placed on improved cookstoves, meaning that there is a significant difference between the baseline and the project line cooking conditions. This difference has to be measured and verified in order to prove impact that relates to the objectives of the programme, whether it is health impact, time or fuel savings or Greenhouse Gas emission (GHGe) reduction. International testing protocols, thus far absent for ICS, recently started being solidified by the International Standardization Organisation (ISO). Despite this commendable development, protocols may not be applicable in all cooking situations, the variety of which defies the basic idea of 'standards'. The enforcement of international standards appears even more difficult given the limited local capacity found in developing countries and the scientific robustness needed. GHGe and health impact appear especially challenging to measure and need a specialist.

Recent studies⁴ have also shown that the benefits of so-called improved stoves, far from being automatic, require careful planning. Accounting for household behaviour when assessing the stove appears key, and laboratory tests, whilst needed, are not sufficient to select 'optimal' technologies. Ultimately, it is the users themselves who will reveal their valuation of the stove through their usage and purchase decisions. In all cases, substantial time and resources should thus be invested in gauging real-life stove performance, cooking habits and user preferences.

What then is a recipe for success? Although by no means complete, a number of valuable insights arise from the Lao ICS programme, further linked here to the growing experience of cookstove developers⁵ and the literature.

1. Cementing multi-stakeholder cooperation through flexible arrangements: alongside technical expertise, the formal and informal management structure and organisation culture chosen for a given programme appear elemental in creating a striving learning environment for all ICS stakeholders. In order to build local capacities, the Lao ICS programme has chosen to rely as much as possible on existing knowledge and to strengthen competences around testing, while SNV has brought in a long track record of successful domestic biogas programmes and multi-stakeholder developments. On the local operational level, flexibility should initially be targeted, for example through short time output-based contracts, which help formulating realistic expectations and allow to fall back on alternative providers in case of default.

⁴ See for example Hanna et al., 2012. *Up in Smoke. Influence of Household Behaviour on the Long-Run Impact of Improved Cooking Stoves.*

⁵ Including GERES, GIZ and SNV. See for example: SNV, 2009. *Building Viable Domestic Biogas Programmes: Success Factors in Sector Development.*

LESSONS LEARNED

As a result of this open approach, the Lao programme is now able to further build upon its fruitful partnership with the Lao Women's Union in awareness raising activities whereas the Ministry of Science and Technology renders testing services.

2. Time, long-term finance and harmonised donors: the deployment of a successful ICS programme firstly requires sufficient time to prepare, validate and implement the intervention properly. A solid feasibility study that clearly lays out risks and assumptions is a first necessary step. In Laos, it took one preparational year to assess the feasibility of the scheme and select viable partners; a two-year pilot phase was then implemented for all stakeholders to practice and learn. In 2013, the programme finally reached a stage where it could be upscaled nationally through peer-training and interprovincial cross linkages. Unlike earlier years, where the programme largely relied on external expertise, it can now lean on national champions of change among producers, retailers, testers and policy makers that are able to disseminate skills, knowledge and give inspiration.

Aside from time, an ICS programme should also be able to count on long-term secured finance. Although, funding should ideally be secured for the entire layout of the project, budgets for ICS programmes are often substantial, and thus require a relay of different donors whose policies and objectives must be aligned under the broader project vision. The Lao programme was funded by SNV and Oxfam for 2011-2012 and is funded by the EU, Oxfam and the Blue Moon Fund for 2013-2016. In order to prevent uncertainties and stress on executive bodies because of conflicting donor demands and constraints, the programme focused on building consensus, continuity and trust among its various donors. Donor harmonization should be a key focus of all ICS projects to prevent market disruption, a clouded investment horizon and counterproductive incentive schemes for stakeholders.

3. Building proof – Monitoring and evaluation: monitoring systems for ICS keep track of dissemination stoves by recording serial numbers of stoves, with information on producers, retailers and users. In Lao, despite the difficulties first met in making retailers write down customer data, a solution was found in leveraging the national excitement around lotteries. Stove buyers are invited to fill in a voucher at the time of purchase, then placed into a box and kept with the retailer. Project staff, to add to the database, regularly collects the vouchers, and lottery winners are drawn biannually. Thus far, 25% of the stoves can be traced back to the user, a number significantly higher than the anticipated 5%. The telephone numbers make it possible to conduct telephone surveys, through which the programme has also been able to gain valuable market intelligence and adapt and improve its operations.



Figures 5 and 6 – Testing and production of the introduced ICS

STANDARD DATA

4. People: Last but not least, the people involved (producers, retailers, testers and users) are essential for a successful cookstove programme development. Because the targeted retailers and producers are independent and have the freedom to decide whether to cooperate or not, interpersonal skills and convincing arguments are key in determining dissemination levels. The Lao programme engaged the various actors of the value chain in a rational, enthusiastic, and at the same time 'take it or leave it' fashion. It identified supporters for innovation and left aside those who were strongly and permanently opposing. Cooperation agreements were made to be flexible and have been extended strengthened or have expired depending on the quality and speed of delivery. Through this strategy, the programme has kept maximum control over the process and has avoided undesirable lock-ins.

The Lao ICS programme, alongside the experience gained in other countries thus provides some valuable lessons on promising and less promising routes to take to further the uptake of ICS worldwide. SNV, along with its various partners, seeks to constantly build upon the new lessons learned, and thereby propose strategic, holistic, and adaptable frameworks for ICS adoption.

Duration: Phase 1, 2010-2013, Phase 2, 2013-2017

Partners: Blue Moon Fund, Oxfam, ARMI, SWITCH Asia

More information:

<https://www.facebook.com/improvedcookstoves>

<http://icslao.info/>

<http://www.snvworld.org/>