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Global Alliance for Clean Cookstoves

Peru Market Assessment

Intervention Options

Accenture Development Partnerships

Introduction

- This Market Assessment was conducted by Accenture Development Partnerships (ADP), the not-for-profit arm of the global management consultancy, Accenture, on behalf of the Global Alliance for Clean Cookstoves (the Alliance). The information in this assessment is accurate as of 2012 when this study was conducted.

- It is intended to provide a high level snapshot of the sector that can then be used in conjunction with a number of research papers, consumer surveys and other sources (most published on the Alliance's website) to enhance sector market understanding and help the Alliance decide which countries and regions to prioritize.

- It is one of eighteen such assessments (as of December 2013) completed by the Alliance to:

    - Enhance sector market intelligence and knowledge.; and
    - Contribute to a process leading to the Alliance deciding which regions/countries it will prioritize.

- Full slate of market assessments include studies in: Bangladesh, Brazil, Colombia, East Timor, Ethiopia, Ghana, Guatemala, India, Indonesia, Kenya, Mexico, Nigeria, Peru, Rwanda, South Africa, Tanzania, Uganda and Vietnam.

- Each assessment has two parts:

    - Sector Mapping – an objective mapping of the sector.
    - Intervention Options – suggestions for removing the many barriers that currently prevent the creation of a thriving market for clean cooking solutions.

- In each Alliance study a combination of ADP and local consultants spent 4-6 weeks in country conducting a combination of primary (in-depth interviews) and secondary research. They used the same Market Assessment 'Toolkit' for each country so that comparisons can be made. The Toolkit is available free of charge to all organizations wishing to use it in other countries.

- **The Alliance wishes to acknowledge the generous support of the following donors for the market assessments: *Barr Foundation, Dow Corning Corporation, Shell Corporation, Shell Foundation,* and the governments of *Canada, Finland,* and *Spain*.**

This market assessment was produced by Accenture Development Partnerships (ADP) on behalf of the Alliance. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of the Global Alliance for Clean Cookstoves or its partners. The Alliance does not guarantee the accuracy of the data.

Content

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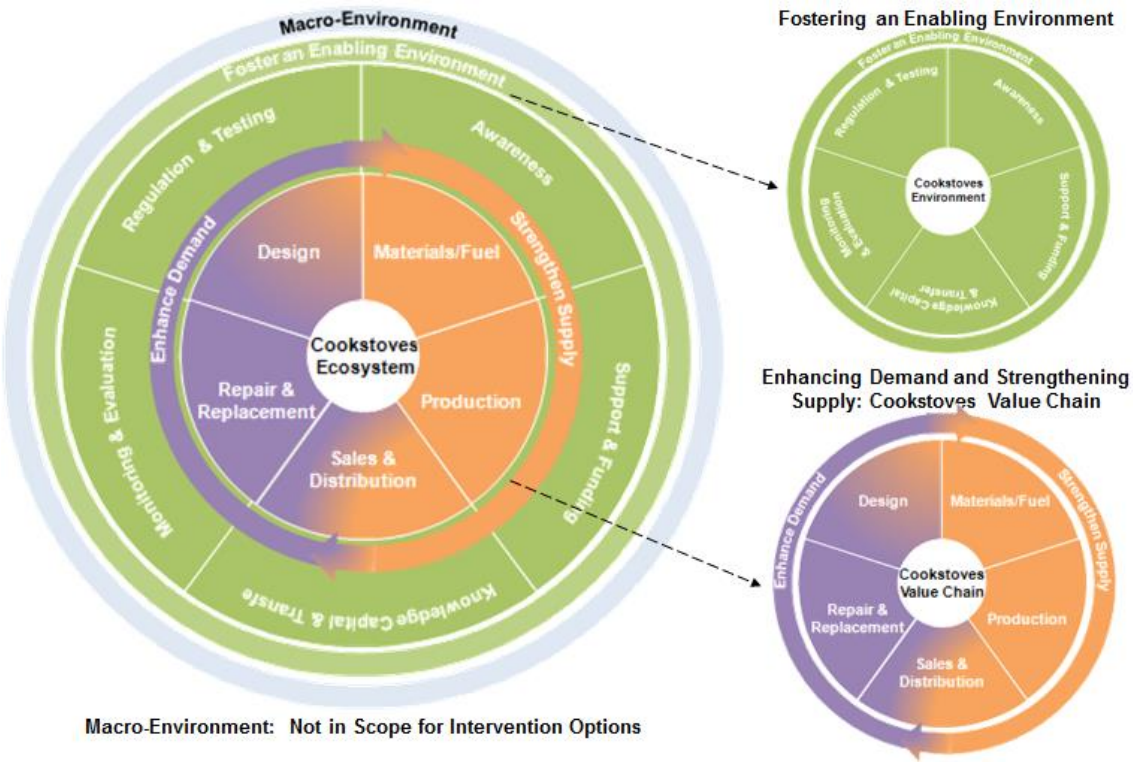
Executive Summary

As a result of the Peru cookstove market assessment, five intervention options have been identified to foster an enabling environment and nine intervention options have been identified to enhance demand and strengthen supply.



Fostering an Enabling Environment Intervention Options

1. *Awareness*
2. *Monitor & Evaluate*

Enhancing Demand and Strengthening Supply Intervention Options

1. *Materials/Fuels*
2. *Repair & Replacement*
3. *Production*

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Peru Sector Mapping (1 of 2)

34%[1] of Peruvian households currently cook with kerosene or solid fuels without a chimney, and suffer from indoor air pollution (IAP). The World Health Organization estimates that 1,500[2] deaths are a result of this.

While the focus is now on the health benefits of improved cookstoves (ICS), the original driver was deforestation. 60% of Peru is covered by rainforest – roughly 20% of the Amazon. Although slash and burn farming remains the major threat in the region, ICS is seen as an additional method of addressing deforestation. Peru aims to completely halt deforestation, which globally accounts for 18% of carbon emissions, by 2018 with international funding.

The government and a handful of NGOs began implementing ICS initiatives in the 80s, although the realities with regard to stove efficiency are unclear. *CentroECO* was one of the first NGOs to undertake a systematic approach to the issue of household cooking practices, and implemented the '*Healthy Kitchens*' and '*Healthy Homes*' projects in 1996 and 1999 respectively in partnership with *Winrock* and *USAID*. They took a holistic approach to the sector using a comprehensive pilot to understand which stoves were likely to be successful and offered sufficient efficiency improvements. They also addressed the issues of 'stove ownership' and micro financing through innovative bartering schemes.

Several initiatives built on this, but momentum was slow until 2007 when the First Lady Pilar Nores de García helped establish the "*Instituto Trabajo Y Familia*" *(ITYF*), which launched the "*Sembrando*" project. This project has distributed over 90,000 stoves to date, and in 2011 it received carbon credits under the "*Qori Q'oncha"* PoA. *Microsol* began developing this PoA in 2008, enabling rural communities to benefit from carbon financing by reducing the barriers for implementers.

In 2009, *GIZ* and *ITYF* launched the "*Medio millón de cocinas mejoradas por un Perú sin humo*" campaign with the aim of raising awareness of the benefits of ICS within the central government. The campaign carried out research regarding the health implications of IAP and successfully raised the profile of the numerous NGO projects in progress in 2009. The campaign also established the need for an independent stove testing facility which could ensure improved cookstoves were of a suitable standard. As a result, *GIZ* worked with the government to fund the *SENCICO* testing facility.

The Ministry of Energy and Mining (*MINEM*) launched "*Project Nina"* (Oct. 2009 – Dec. 2011) and successfully distributed 40,000+ Liquefied Petroleum Gas (LPG) stoves and 64,000+ improved wood burning stoves to rural communities. While the long term strategy is focused on LPG, the government remains very supportive of improved wood burning stoves for the immediate future.

The market remains dominated by NGO and government initiatives, which are reaching a large number of households (currently over 225,000), but the private sector is less well established.

Source: [1]Censo Nacional 2007 (INEI), [2]WHO Indoor Air National Burden 2004

Sector Mapping (2/2)

	Findings
Social and Environmental Impact	Income inequality is a key concern within Peru; the government is focusing on addressing the issue, but indoor air pollution still disproportionately affects the poorest in rural communities. ICS could have a profound impact on rural communities, both in terms of health and household economics. Some households have started to use the time saved through ICS use to produce artisanal products that can be sold as a source of secondary income. Due to Peru's vulnerability to climate change, deforestation is also a key driver and as such, the government is strongly pursuing increased LPG use.
Consumers	Most initiatives are focused on the 0.4 million rural and 0.1 million urban households currently living in extreme poverty (less than 1.7 USD/day). The poorest regions are often the most inaccessible, with the Andean region being the most impacted due to poor infrastructure and wood scarcity combined with the low pressure and temperature due to the high altitude. These households lack access to capital and are often isolated.
Cookstove Industry	The sector is very well developed with large NGO and government projects dominating the market. There is a government testing facility which manages stove certification and several academic institutes are providing support across the sector. The *Cocina Mejoradas* campaign successfully completed key research, tracked progress and raised awareness of IAP, as well as fostering a collaborative environment.
Carbon Financing	The *Qori Q'oncha* PoA works with 90% of cookstove implementers and has greatly increased accessibility to carbon credits. The first credits were awarded to Sembrando in 2011, and although progress is being made the PoA is still in it's infancy.

Implications for Intervention Options

The central government is acutely aware of the health and environmental impacts associated with communities using open fires. While this has not been communicated to all local governments, many are working with NGOs/central government to implement ICS projects and there is momentum within the sector.

The sector mapping has shown that cookstove interventions should take into account the following:

- The success of the in situ stove. While cleaner fuels should be pursued, the Inkawasi style ICS has been widely received without issue and offers acceptable efficiency gains. Since LPG is an achievable goal in the next 5 years, efforts should be focused elsewhere than on investing in additional research/marketing of improved wood burning stoves e.g. LPG awareness/accessibility, solar
- The benefits of the testing and standards authority can only be realized if the technicians in the field are building the stoves to a high standard using quality materials
- In December 2011, the "*Medio millón de cocinas mejoradas por un país sin humo*" campaign ended. It is critical the information obtained by the campaign e.g. implementation data, best practice is captured by a similar initiative going forward. However, the initiative should aim to reach the national ICS sector since awareness within central government is no longer an issue.

The key opportunities within the Peruvian cookstove sector are increasing awareness within the wider population, encouraging local government to take ownership and increasing the focus on project sustainability e.g. monitoring and evaluation, maintenance, supporting post implementation.

Cookstove programs should build on the strength of the sector to encourage private companies to address demand in households not eligible for 'free stove' initiatives, as well as improving repair and replacement procedures. The government drive for clean fuels should be supported in a manner that limits negative consequences to the sector/society overall.

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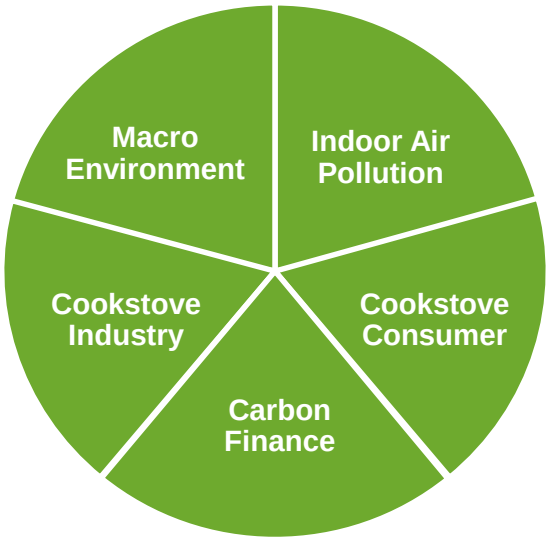
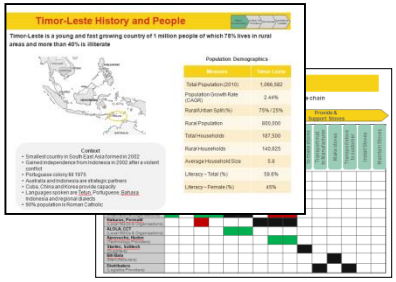
Project Approach

A structured approach first assessed the market for a cookstove industry and then used the sector mapping output to develop the intervention options and Relative Roadmap.

Sector Mapping



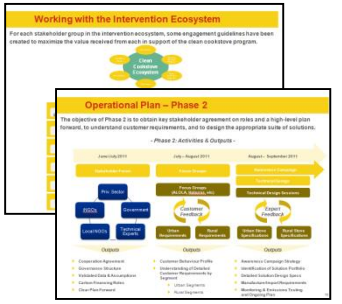


Sector Map

Focus of This Deliverable

Strategy Development

Identify Intervention Themes → **Develop Recommendations** → **Develop Relative Roadmap**



Interventional Options And Relative Roadmap

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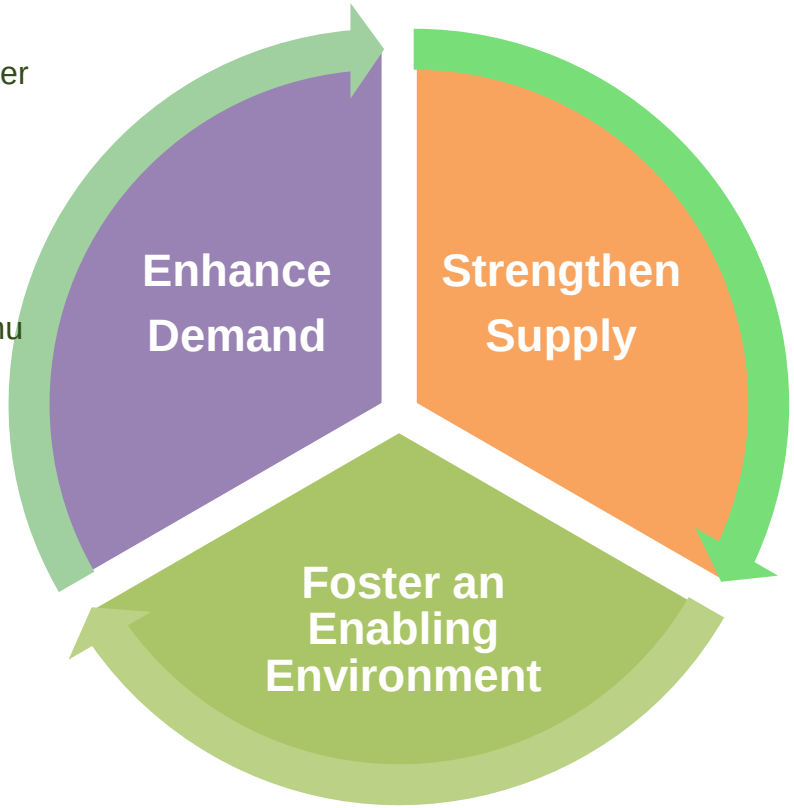
Project Approach

A three-pronged strategy has been developed to spur the clean cookstoves market.

- Understand and motivate the user as a customer
- Reach the last mile
- Finance the purchase of clean cookstoves and fuels
- Develop better cookstove technologies and a broader menu of options



- Finance clean cookstoves and fuels at scale
- Access carbon finance
- Build an inclusive value chain for clean cookstoves and fuels
- Gather better market intelligence
- Ensure access for vulnerable populations (humanitarian)

- Promote international standards and rigorous testing protocols, locally and globally
- Champion the sector to build awareness
- Further document the evidence base (health, climate, and gender)
- Engage national and local stakeholders
- Develop credible monitoring and evaluation systems

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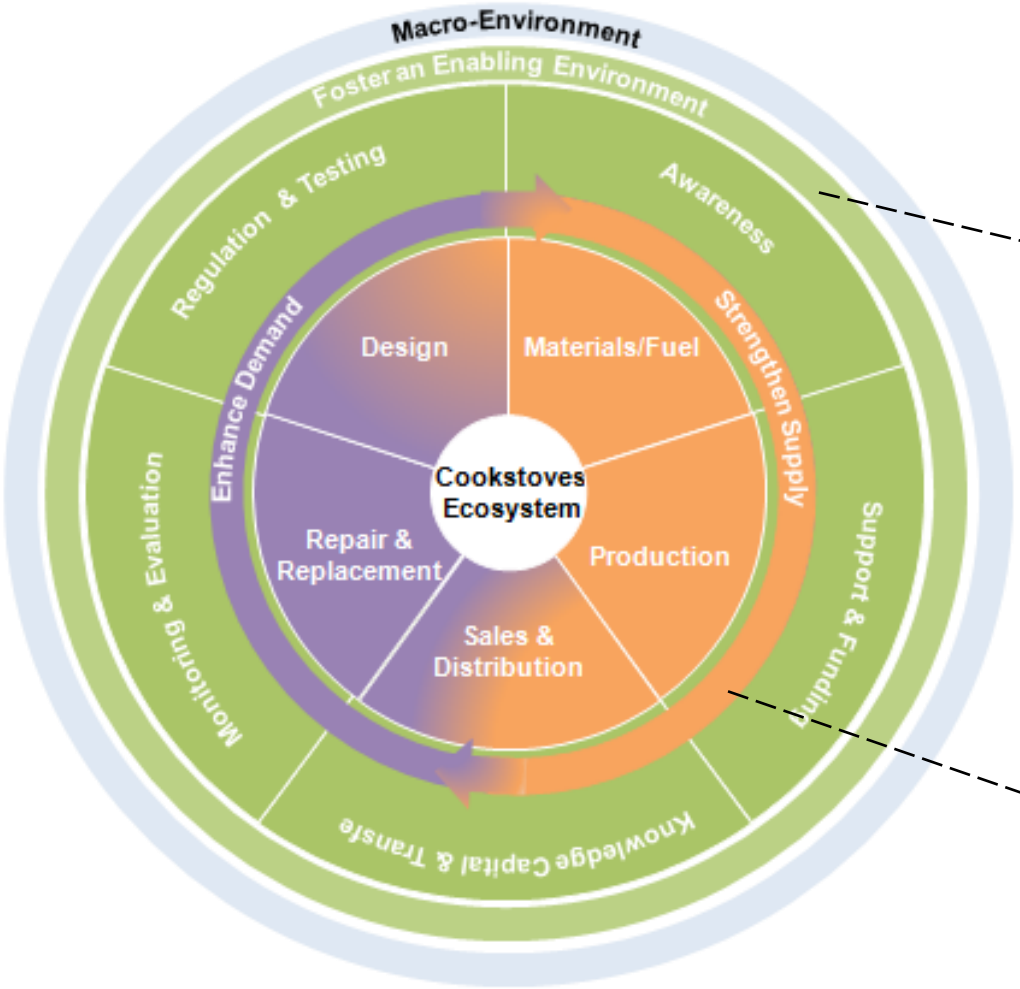
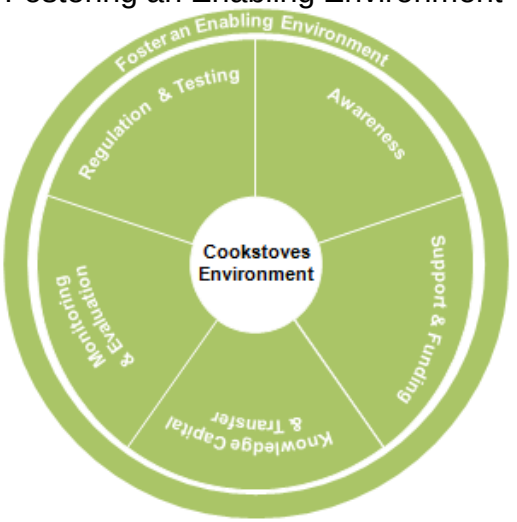
Project Approach

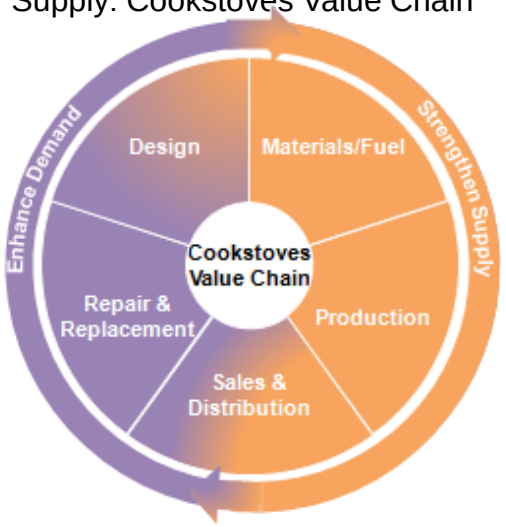
The Interventions are analyzed according to their impact on the three-pronged strategy.



Fostering an Enabling Environment



Enhancing Demand and Strengthening Supply: Cookstoves Value Chain



Macro-Environment: Not in Scope for Intervention Options

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The Case for Action

Originally implemented to address deforestation, there is a growing awareness of the health benefits of ICS and considerable momentum and funding within the sector – especially within NGOs and government.

- The Case for Action -

What's Happening?	*So What?*	*Why Now?*
The main impacts of inefficient cookstoves in Peru are deforestation and the health of the communities 2.6 million households affected by IAP The government (especially MINEM) and NGO sectors are very active Large PoA set up, working with 90% of ICS implementers Official testing and standards centre established	A large percentage of the rural community still cook using wood on open fires. The government plans to dramatically increase the use of LPG by lowering the cost and improving last mile distribution. However, LPG is not possible for all rural areas in the short term (not least due to the misconceptions around cost, safety etc.) As such, there is a need to continue disseminating improved wood burning stoves	The "*Medio millón de cocinas mejoradas*" campaign was very successful in uniting over 20 key implementers in Peru. It carried out essential research, raised awareness and built core capabilities. The campaign ended in Dec. 2011 and it is crucial that momentum is not lost. The government has substantial funding available and support with regard to best practices could have a major impact for a relatively low cost. The Microsol PoA could be used to assist other PoAs currently in their infancy

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Fostering an Enabling Environment

The market today

There is considerable momentum within the market and a vast amount of funding is available. Currently, income tax and right to extraction fees from mining and oil industries (non-renewable resources) are collected and 50% are distributed to the regional and local governments - “canon, sobrecanon & regalía minera”. Through the campaign, a law is now under review to allow up to 10% of these funds (billions of dollars) to be spent on improving livelihoods, for example, through cookstoves, water systems, and latrines.

The Academic sector is also actively involved, with several universities working with government and NGO projects to help develop more efficient/versatile/cost effective stoves and improve current distribution models. PUCP and UNI (both in Lima) are the key academic institutes present.

The Sencico testing facilities have had a marked improvement on the sector, allowing stove quality to be monitored and thus ensuring projects are delivering real value to the communities. While benefitting the sector, there are concerns from implementers that the testing facility is inaccessible for small initiatives who need to transport their materials to Lima to be tested and the limited capability of the center to test stove durability.

SENSICO Testing facility
- courtesy of SENSICO

Fostering an Enabling Environment

There are no fuel standards in place, although most rural households use wood/dung and there is a concerted effort from the government to move towards LPG.

The "*Medio millón de cocinas mejoradas*" campaign was a strong force within Peru, uniting over 20 implementers to ensure a collaborative environment that enabled best practices to be shared across the sector and ensured political focus remained. Focusing on addressing research gaps, raising awareness within central government, and establishing the testing center at Sencico; the campaign ended in 2011 and care must be taken to ensure the momentum is not lost.

While the campaign raised the profile of ICS within central government, it was less successful at encouraging local governments to support ICS projects. This was due in part to the difficulties faced through the decentralization of power, initiated in 2002. Since local governments assign local prioritization to community issues, areas not yet targeted by implementers often have limited access to key information regarding the dangers of IAP and the potential solutions available.

Another key issue in Peru is the lack of sufficient monitoring and evaluation (M&E) programs to ensure the stove projects are effective long term. Most initiatives provide support for the families for 1 year, with a few implementers providing additional support for up to 2 years. While this is not an issue at present (since most large initiatives are in their infancy) it must be addressed to ensure that the stoves remain in suitable condition and are adopted by the user.

Microsol is key to ensuring that M&E is carried out effectively as this is essential to realize the benefits of carbon financing.

Most in situ stoves in Peru are based on the Inkawasi design

Picture taken from: Energypedia

Fostering an Enabling Environment

Building the market for the future

The intervention options presented with regard to fostering an enabling environment focus on two areas: Awareness and monitoring and evaluation.

Awareness must be increased at the local government level to move funding away from high-profile/limited value infrastructure projects (e.g. stadiums) to key initiatives at the household level. A nationwide awareness campaign using local radio, television and promotional fairs would also ensure that awareness increases in communities who are yet to be contacted by ICS implementers. MINEM have had success with local radio, although it remains underutilized by other parties. Radio Tawantinsuyo, has been used to raise awareness of malnutrition in rural areas, since the station broadcasts in Quechua.

In addition, while several large private companies currently support outreach programs in this sector, e.g. Repsol sponsoring educational/promotional material for MINEM, there is space to work more closely with the private sector. Along with funding, the private sector could provide expertise regarding process design and M&E implementation which would greatly benefit local implementers.

Awareness and M&E could both be improved by forming partnerships with other initiatives in-country (working closely with grassroots NGOs e.g. CentroECO) and sharing best practice with implementers in other geographies using in situ stoves, e.g. Mexico. Drawing on the collaborative nature of the "*Medio millón de cocinas mejoradas*" campaign, it is critical to ensure that a central body continues to track progress made within the sector, incorporating M&E if possible.

Sourcing wood in the Andean region can be a time consuming process since most accessible wood is on privately owned land

Foster an Enabling Environment

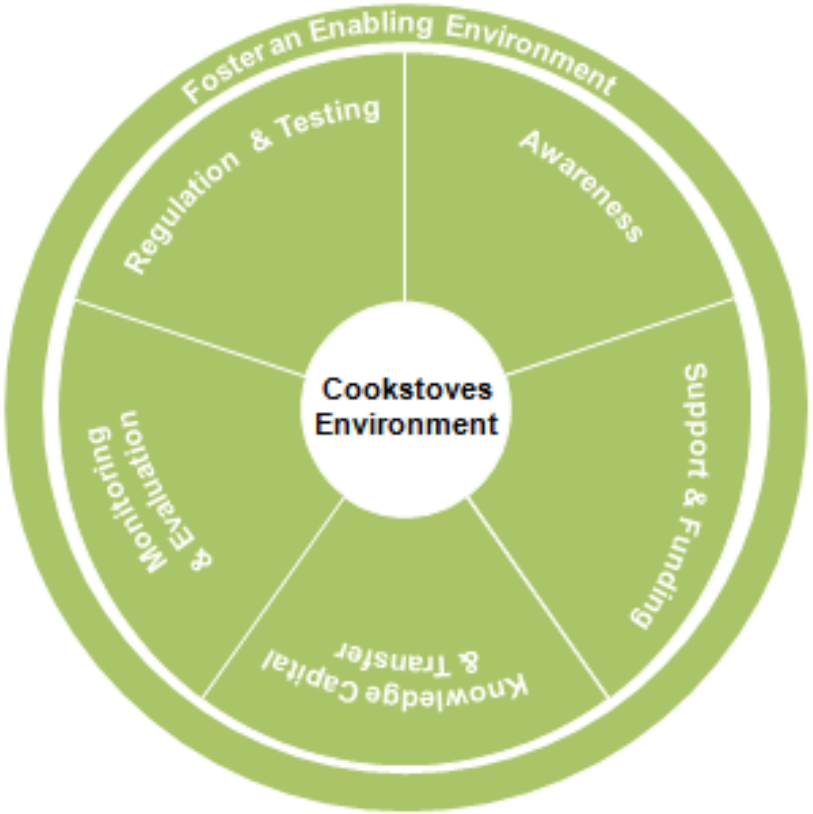
Through the campaign "Por un país sin humo," Peru has made great strides in fostering an enabling environment, but some gaps remain in the areas of awareness and monitoring and evaluation.

Regulation & Testing

- ✓ Indoor Air Quality Standards
- ✓ Cookstove Standards
- ~ Fuel Standards
- ✓ Standard Enforcement

Monitoring & Evaluation

- ~ Monitoring implementations
- ✓ Tracking and Quantifying Success



Awareness

- ~ Consumer Awareness
- ~ Stakeholder Awareness
  - ~ Government
  - ~ Private Sector

Support & Funding

- ✓ Government
- ✓ INGOs and Associations
- ✓ Local NGOs and Associations
- ~ Private Sector
- ~ Academics

Knowledge Capital & Transfer:

- ✓ Health
- ✓ Environment
- ~ Gender
- ✓ Cookstove-Specific

KEY: ✓ Advanced/ Favorable ~ Has Potential/ Neutral ✗ None/ Unfavorable ▭ Focus Area

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Awareness

While the "*Medio millón de cocinas mejoradas*" campaign was very successful at raising awareness at the central government and NGO level, it was less successful at reaching the decentralized local governments.

Situation

There is basic awareness of the health implications of inefficient cookstoves (although long term consequences are less well known). The campaign researched the long term health implications and ICS gained prominence. However, due to decentralization, many local governments are unaware of available funding and support.

Rationale

- Local governments lack awareness of the campaign and hence the long term health impacts, funding & support available
- Awareness is carried out locally by each implementer leaving some communities uninformed
- The private sector is a minor player with regard to ICS. Some companies fund initiatives, but there is room to scale up

Intervention Options

	Involved Parties	Likelihood of Success	Budget	Estimated Time
1. Promote communication and coordination between local authorities	Gov't, Local gov'ts	Medium	Medium	6 months
2. Raise awareness of ICS at the national level	Gov't, NGOs, Academic	High	Medium	1 year
3. Work with private sector companies to encourage more ICS initiatives	Private, NGO, Gov't	Medium	Medium	1 year

Sources: Interviews

Awareness

National campaigns, improved collaboration across the public sector, and greater awareness within private companies could have a major impact on both supply and demand of ICS.

- Intervention Options-	- Actions -	- Outcomes-
1. Promote communication and coordination between local authorities	• Build on the principles developed by the "*Medio millon de cocinas mejoradas*" campaign to include regional and local authorities • Work with provincial mayors, highlighting the benefits and promoting ICS within local targets • Coordinate awareness workshops for each provincial municipality	• The campaign was very successful, but scope was limited. Utilizing lessons learned and best practice will increase engagement • Demonstrating the demand within rural communities and the growing awareness could result in a move towards ICS and away from 'high profile/limited value' spending • Local workshops will encourage collaboration and help to build momentum
2. Raise awareness at the national level	• Run 'local' awareness campaigns nationally. Peri-urban households/ communities typically have access to TV, but local radio is the most accessible and is used for current initiatives e.g. role plays by MINEM (use Radio Tawantinsuyo, Quechua) • Incorporate awareness of health and environmental impacts at institutions e.g. school programs, health centers – work with Programa Integral de Nutrición	• Increased demand from the rural communities. This increased demand could encourage private ICS implementers to enter the market, increasing the rate of dissemination in a more sustainable manner • Increased demand will also ensure government focus is sustained
3. Work with private sector companies to encourage more ICS initiatives	• Expand private enterprise outreach programs e.g. Repsol currently partner with MINEM on LPG awareness campaigns • Encourage private companies within focus locations to support ICS initiatives – sharing key expertise/ experience, providing governance	• Several extractive companies have funded community outreach ICS programs, encouraging this (although not without issue) can draw on private funding and implementation support to increase dissemination • Private sector experience will aid dissemination

Sources: Interviews

Monitor & Evaluate

Most implementers realize the importance of M&E, but are unable to implement long term monitoring due to a lack of resources and experience. CentroECO monitors for four years, but they are in the minority.

Situation

It is difficult to evaluate the success of implementation projects and the durability of the stoves due to a lack of data obtained through monitoring. Most projects perform basic monitoring for 1-2 years but long term sustainability is unclear. Microsol is championing improved M&E processes, since it is critical to enable carbon financing.

Rationale

- Minimal M&E expertise despite the awareness of its value and the training provided by Microsol. Difficult in part since the stoves are built in situ by local technicians
- While the "*Medio millón de cocinas mejoradas*" campaign has been very successful at tracking and quantifying success for most organizations, there is no data for implementers outside the campaign

Intervention Options

	Involved Parties	Likelihood of Success	Budget	Estimated Time
4. Share best practice from other geographies/ initiatives	Alliance, Private sector, Gov't, NGOs	Medium	Small	1 year
5. Extend the reach of the campaign to build a comprehensive tracking tool	Gov't, NGOs	High	Small	6 months

Sources: Interviews

Monitor & Evaluate

Setting up partnerships with local NGOs can result in detailed yet cost-effective monitoring and evaluation.

- Intervention Options-	- Actions -	- Outcomes-
4. Share best practices from different geographies and initiatives from other sectors	• Build a knowledge sharing site for ICS, including best practice and lessons learned at the global level. Sembrando/ GIZ are best placed to lead this due to their success with the campaign • Based on the findings, promote monitoring best practice through the campaign (e.g. create a standardized tracking tool/process). Potentially use carbon financing to fund/incentivize • Work with other sectors to manage M&E e.g. NGOs which are embedded in communities e.g. CentroECO • Share lessons learned with other initiatives in Peru which utilize M&E. Draw on experience from the private sector e.g. distribution models for food/drink (coke)	• Build key relationships; ideally enabling lower M&E costs through partnerships • Private companies in the region may have relevant experience/tools which • Ensure that the projects are realizing maximum benefit for the time and money invested. Currently the lack of awareness as to the long term sustainability e.g. stove use, stove durability create a number of key unknowns • Ensure that carbon financing can be utilized to increase access to ICS
5. Extend the reach of the campaign to build a comprehensive tracking tool	• The campaign ended in 2011, need to ensure that a central body continues to collect implementation data – this could be managed by the government or an impartial party e.g. SENCICO, Microsol • Create incentives for implementers to share data with the governing body e.g. reduced training/certification fees for technicians and ensure the system is simple and accessible for all (preferably online)	• Ensure that the progress made by the campaign is built upon and the data doesn't become obsolete • Increase visibility as to the most prolific implementers and understand the reasons e.g. funding, more demand due to stove design/awareness campaigns, more efficient implementation model • Gather comprehensive data to ensure small implementers are given adequate visibility and support

Sources: Interviews

Cookstoves Value Chain

The market today

There is a clear difference between the rural and urban cookstove sectors. In urban areas 71% use gas while rural areas are dominated by wood use (77%). Wood burning stoves are either open fires or in situ adobe/brick stoves based on the standard Inkawasi design created during the original 'Healthy Kitchens' Project.

The vast majority of ICS implementers use this design as it has been widely accepted by rural communities in all 3 geographies (coastal, highlands, and rainforest).

Typical improved in situ construction stove.
The stove has been decorated by the family post project.

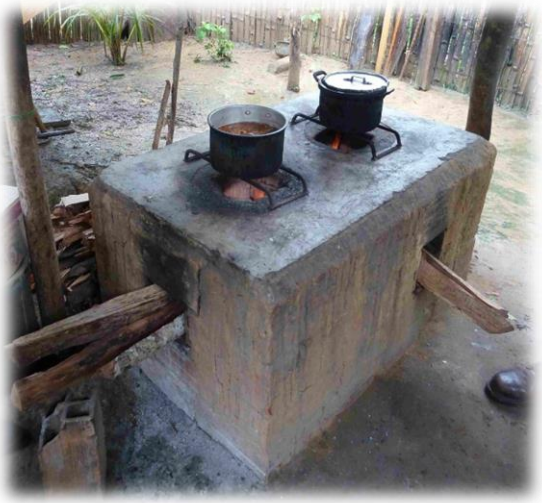
The stoves typically consist of 2-3 burners, enabling the families to cook traditional Peruvian meals (usually a soup and 'segundos' or main course) and are made predominantly of locally sourced materials e.g. brick, adobe.

Most implementers use a similar model – the family builds the stove base and collects the necessary brick/adobe from the surrounding area (to encourage 'buy-in'), local technicians are then trained by the implementer/local municipality and build the stove using the basic materials and additional components, i.e. chimney, stove top, grill, combustion chamber which are not readily available at the required standard. The families are often required to assist or at least be present during the building process to ensure they are familiar with the basic principles and capable of simple stove maintenance.

Some implementers then carry out training for the household with regard to good cooking practices and complete basic follow up and monitoring exercises for the subsequent months. It is worth noting some houses encountered on site visits were undergoing monitoring, but were still in a poor state.

Cookstoves Value Chain

There are 2 variations of this basic design, the standard indoor stove and the ICS without a chimney used to cook outside in the rainforest



ICS without a chimney are popular with households in the rainforest region

There are a handful of portable stove makers, but the design is very similar to the in situ stove. During interviews, it became clear that portable single burner stoves used in other regions were not suitable for Peru.

The rural market is heavily focused on wood burning stoves, although solar and biogas pilot projects are in progress. The cost of biogas installations is currently prohibitive, but solar stoves have potential, especially within isolated communities in the highlands; the conditions are suitable and fuel is very scarce.

Materials & fuel

While the basic materials are readily available and the additional components can be transported as required (albeit at considerable cost), there is a lack of consistency with regard to the quality. Stove implementers reported that since many component manufacturers are unaware of the rationale behind standardized production, they fail to produce high quality products. There is also a concern that while local materials are convenient and cheap, they may lack durability and hence the savings may not be realized.

There are numerous benefits of households moving towards cleaner fuels, namely LPG. However, distribution, cost and consumer misconceptions are key barriers at present. In peri-urban areas, many poorer households who have received ICS and LPG stoves through government and NGO initiatives prefer to use the improved wood burning stove as there is a perception that it takes longer to cook on a gas stove as well as concerns about safety of LPG.

Cookstoves Value Chain

Production

Since most initiatives use trained technicians, implementation can be relatively swift. However, there is currently no accreditation scheme for technicians/masons. As such, once the project is finished, there is no formal recognition to enable those who are trained to differentiate themselves in the market. It also leads to a gap in the stove certification process, since the stove may be efficient from an engineering perspective, but difficult to build to the same specification in the field.

Since technicians are trained as part of implementation projects, there is also a lack of trained technicians in other regions, who could be building high quality stoves through private enterprise.

It is difficult for private ICS companies to become established, since they cannot compete with the 'free' stove model of NGOs/government, suffer from corruption within local authorities, and have limited access to capital.

Repair and replacement

The current initiatives have been very successful at reaching a large number of rural households, but the long-term sustainability remains an open question. The households are often expected to maintain the stoves, with no long-term commitment from the project, i.e. no warranties available beyond 'best-endeavour' monitoring.

Católica Santo Toribio University is carrying out research into long term durability, in partnership with Sembrando. This type of study is critical to understanding the sector, but funding is uncertain and the researcher is unlikely to commit to the project long term.

Microsol is helping implementers access carbon financing with the aim of funding stove maintenance, but this is still in the early stages. To obtain carbon credits, the efficiency of the stoves must be maintained. It seems unlikely that this can be achieved by inexperienced members of the household who may have been trained in basic maintenance 12 months before.

Cookstoves Value Chain

Supply and demand enhancement

While Sencico ensures stoves are designed to a high level, the results in the field are less regulated. Expanding the current standards to include stove components and setting up an associated monitoring process would ensure the benefits of the standards process are realized.

Currently, once a stove is certified at Sencico there is no follow up. With stoves only being retested if there is a legal change in standards, organizations may inadvertently adapt their design over time. Establishing an accreditation scheme for technicians (renewed each 6 months) would also close the gap between Sencico and the implementation realities. Certified technicians would also be able to differentiate themselves in the market, and thus enable informed consumer decisions.

The certification process would also act as a forum to keep technicians abreast of key developments in the sector. Appointing regional SMEs would aid coordination between local and central government. Reporting into MINEM (to limit corruption), they would act as a focal point for all parties as well as performing technician training/certification and overseeing project monitoring e.g. spot checks. As an ICS champion, they can also manage awareness initiatives and build key relationships with other sectors e.g. outreach projects within extractive industries.

This approach would enable training to be rolled out nationally, reducing dependency on local government/NGOs and reaching middle income regions, currently overlooked by many initiatives.

With regard to improved fuels, although MINEM is focussing on addressing LPG concerns (including last mile distribution and cost) support may be required to ensure there are no unexpected outcomes associated. India increased LPG share through similar subsidies and care should be taken to ensure other ICS producers are not unnecessarily priced out of the market.

The private ICS sector is underdeveloped at present, since they struggle to compete with ‘free stove initiatives’. Creating favorable market conditions could address this e.g. reducing corruption through MINEM governance and ensuring that in areas where there is demand, the private sector is allowed to develop. Large initiatives such as GIZ, Sembrando and MINEM could also use a percentage of their budget to help private ICS producers establish themselves, thus increasing ICS dissemination across Peru, at minimal expense to the sponsor.

Enhance Demand and Strengthen Supply: Cookstoves Value Chain

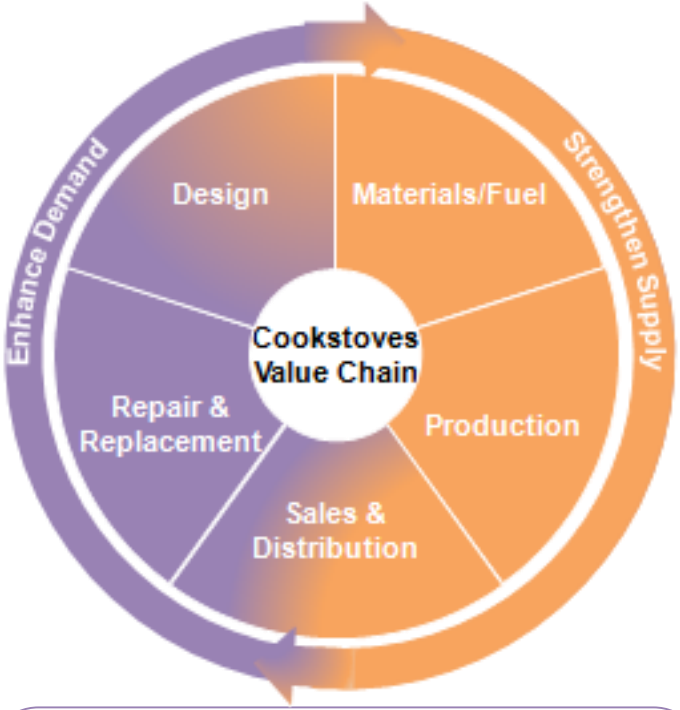
Through gaps identified in the cookstoves value chain, intervention options will focus on materials/fuel, production and repair and replacement.

Design

- ✓ Stove Type
  - ✓ Fixed
  - ~ Portable
  - ~ Biogas Digester
  - ✗ Solar
- ✓ R&D
  - ~ Private
  - ✓ Gov't/Academics

Repair & Replacement

- ~ Supply of Repair Skills and Parts
- ~ After-sales Service



Materials/Fuel

- ✓ Stove Raw Materials Supply
- ✓ Stove Raw Materials Cost
- ~ Fuel Value Chain
  - ✓ Biomass
  - ✗ Clean Coal
  - ~ Solar/Biogas
  - ✗ Petro based
- ~ Cost of Clean Fuels

Production

- ~ Scalability
  - ~ Handmade
  - ✓ Masons
  - ✗ Factory
- ✓ Producer Fragmentation
- ✓ Producer Financing
  - ✓ Access to Capital

Sales & Distribution

- ✗ Financing Purchasing (micro-credit)
- ✓ Carbon Financing
- ~ Customer Segmentation
- ✓ Implementation Pilots
- ~ Last Mile Distribution
- ~ Reach Vulnerable Populations

KEY: ✓ Advanced/ Favorable ~ Has Potential/ Neutral ✗ None/ Unfavorable Focus Area

GLOBAL ALLIANCE FOR CLEAN COOKSTOVES

Materials/Fuel

The vast majority of cookstove initiatives build in situ adobe/brick stoves. However, key components like the chimney and the stove top are required and quality control/distribution concerns remain.

Situation

The components not sourced locally are often expensive to transport to rural areas, and quality concerns remain about local and non local materials (especially long term durability). While wood is readily available in most of the country, deforestation remains an issue and LPG is struggling to gain the foothold the government seeks.

Rationale

- While the basic materials are cheap and readily available, the non-local components e.g. grill, chimney, stove top are expensive to transport
- LPG is a key priority for the government, but price and last mile distribution remain barriers. Access to electricity in rural areas remains poor and solar cookers are currently widely unavailable
- The materials often lack the necessary quality to ensure durability

Intervention Options

	Involved Parties	Likelihood of Success	Budget	Estimated Time
6. Improve access to key components	Gov't, NGOs, Private Sector	Medium	Medium	6 months
7. Improve accessibility for clean fuels	Gov't, Local Gov't.	High	High	2+ years
8. Introduce standards/ regulation for cookstove components	Gov't, NGOs	High	High	1 year

Sources: Interviews

Materials/Fuel

The components used for stoves often lack the necessary durability. The local materials are often selected by price and the transported components lack standards and are often damaged en route.

- Intervention Options-	- Actions -	- Outcomes-
6. Improve access to key components	• Work with local authorities to establish more community 'hubs' to transport & store materials in bulk (currently being funded by a handful of local municipalities) • Include transportation in the government tenders to encourage manufacturers to take ownership or quality packaging/storage	• Transporting the goods in bulk will reduce cost, making it possible to build more stoves for the same cost • Hubs in/near each community will reduce the distance the materials are transported by hand/donkey • Encourages best practice which will benefit the public, NGO and private implementers
7. Improve accessibility for clean fuels	• There is a notable gap with regard to clean fuels, but LPG use is a high priority within the government with a strategy of improved distribution and lower cost. Share experiences from similar subsidies/strategies e.g. the impact of subsidized LPG on ICS producers in India • Work with major implementers (MINEM, GIZ, Sembrando) to improve awareness and accessibility to solar cooking options (especially for the highlands) and support the biogas pilot	• Ensure that the LPG initiatives achieve the intended goal by learning from experiences elsewhere and don't unexpectedly skew the market or build reliance on a subsided fuel which may not be sustainably subsidised • Potentially provide cheap-to-run solutions for the hardest to reach communities in the highlands. These households are often very poor, lack fuel (including wood) and are expensive to reach with LPG
8. Introduce standards/ regulation for cookstove components	• Encourage implementers to educate component manufacturers as to the need for them to produce standardized, high quality products – this has worked in Cajamarca (local government/GIZ) • Ensure large component manufacturers are aware of best practice e.g. chimney in 1 piece by including it in the technician training • Build a decentralized testing and standards process for designated local authorities/NGOs that certified stove implementers must use	• The stove quality is improved, resulting in more durability and thus increased customer support for the initiatives • Extending the life of the ICS will enable carbon financing benefits to be realized • Reduces the reliance on stove maintenance • Increase accessibility to certification bodies – currently only in Lima

Sources: Interviews

Production

Mass produced portable stoves popular in other markets are not viable in Peru, as most meals require two to three burners. Most stoves are built in situ by local technicians trained by the project.

Situation

Most initiatives use in situ adobe/brick stoves (although there are a small number of private portable stove producers), with the majority based on the 'Inkawasi' stove. Projects (led by all sectors) rely on training local technicians to enable large scale implementation at reasonable cost within a given timeframe.

Rationale

- While technicians are trained during implementation, there is limited/no training offered for masons in other regions
- Trained masons lack certification to differentiate them from those less qualified and consumers lack information to choose
- Private companies (and small entrepreneurs in particular) face difficult market conditions

Intervention Options

	Involved Parties	Likelihood of Success	Budget	Estimated Time
9. Train additional technicians in other regions	Gov't, NGOs	High	High	1 year
10. Establish & enforce a formal certification scheme for trained masons	Gov't, NGOs, Academic sector	High	Medium	1 year
11. Create favorable market conditions for private companies	Gov't, Private Sector	Medium	Medium	1.5 years+

Sources: Interviews

Production

Training technicians has been very successful, but the impact is limited to the project implementation area. The lack of certification also makes it difficult for consumers to identify trained masons.

- Intervention Options-	- Actions -	- Outcomes-
9. Train additional technicians in other regions	• Train a team of regional experts (at the province level) who are highly trained in ICS principles and work closely with SENSICO to remain abreast of developments • Hold regular training academies/fairs in the towns/large rural communities to train masons in ICS practices and teach key principles e.g. quality of materials, correct stove use	• The regional experts can ensure that key advances/best practice reach the local level in a timely manner • Expand technical ICS expertise beyond the small number of locations currently implementing programs • The technicians could also be trained with regard to the health/environmental benefits of ICS to increase awareness
10. Establish & enforce a formal certification scheme for trained masons	• Use the local academies/fares to train and certify technicians • Monitor the technicians – potentially renew the licenses every 6 months (this needs to be low cost for the technician), to ensure standards are maintained and as a forum to disseminate and share best practices	• Allows master technicians to be recognised, allowing more informed decisions to be made by beneficiaries • Could enable technicians to start private enterprises and increase dissemination • Enables sustained quality and key sector developments to be communicated
11. Create favorable market conditions for private companies	• MINEM to reduce local corruption by providing governance for local ICS tenders • Improve access to capital – encourage NGO and government investment in private initiatives • In areas with private demand, ensure private companies are not priced out by ‘free stove’ initiatives • Include basic business skills in training for stove technicians as performed by MINEM	• Enable the most capable and competitive companies to succeed • Enable companies to scale up, purchase better/more equipment, afford training etc. • Incentives for the companies to grow, in the knowledge that the demand will not be undermined • Building key business skills helps with private initiatives as well as benefitting the broader, local economy

Sources: Interviews

Repair & Replacement

Often the first parts of the stove to show signs of degradation are those not available locally, such as the metal components. This is a key issue since projects may only follow-up for two years or less.

Situation

Most implementers expect the households to take ownership of maintaining, repairing and replacing stove components. However, although beneficiaries often have basic experience of masonry, they are unfamiliar with basic technical concepts around stove efficiency (e.g. no knowledge of measurements or basic principles of ICS). Also, they don't always follow through with required maintenance tasks like regular chimney cleaning even if they were taught during installation. Chimneys are often the first part that needs replacement.

Rationale

- Few projects include maintenance plans beyond requiring the family to build the stove base and be present during the construction
- Poor maintenance can reduce stove efficiency, especially if carried out by untrained parties
- The focus is on implementation rather than on-going support, but many projects are in their infancy

Intervention Options

	Involved Parties	Likelihood of Success	Budget	Estimated Time
12. Encourage implementers to include maintenance plans/warranties	Gov't, NGOs, Private sector	Medium	Medium	1 year
13. Encourage carbon financing to fund maintenance	Gov't, NGOs, Private sector	High	Medium	6 months
14. Promote follow up support from certified technicians	Gov't, NGOs, Private sector	Medium	High	1 year

Sources: Interviews

Repair & Replacement

Encouraging implementers to incorporate maintenance into the project plan, drawing on carbon financing, and promoting certified technicians could increase the sustainability of ICS projects.

- Intervention Options-	- Actions -	- Outcomes-
12. Encourage implementers to include maintenance plans/warranties	• With the creation of future campaigns, ensure that all implementers include a strategy for stove maintenance – whether in-house or outsourced. • Encourage all stove producers within future campaigns to provide warranties and follow up (monitor using spot checks from the regional SME regarding stove maintenance and correct cooking practices). Incentivize projects to be part of the campaign by offering reduced certification costs for technicians	• Improved long term sustainability for ICS implementations, reducing the need for further large scale projects to replace damaged stoves • Enables implementers to build awareness of the typically issues the households face long term • Incentivizes implementers to build high quality stove
13. Encourage carbon financing to fund maintenance	• Reinforce Microsol's focus on using carbon finance to ensure long term sustainability of initiatives by stressing the value of future credits to implementers	• Demonstrating that the maintenance can be used to increase longevity and hence obtain more credits could encourage more implementers to use carbon finance and hence gain access to additional funds
14. Promote follow up support from certified technicians	• Encourage initiatives to draw on the expertise of certified technicians, rather than relying on members of the household who have often received one-off training 2 years prior to the damage occurring • Create a registration database for people to submit stove maintenance, encourage household use and provide financial recompense for the technician	• Stoves are maintained at a higher quality (during the study, we encountered stoves which had been 'maintained' based on the mechanic's instincts and had greatly reduced the efficiency) • Tracks which stoves are most durable • Technicians have longer term career prospects and keep honing their skills, ensuring standards remain • Creates brand loyalty and identifies replacement opportunities

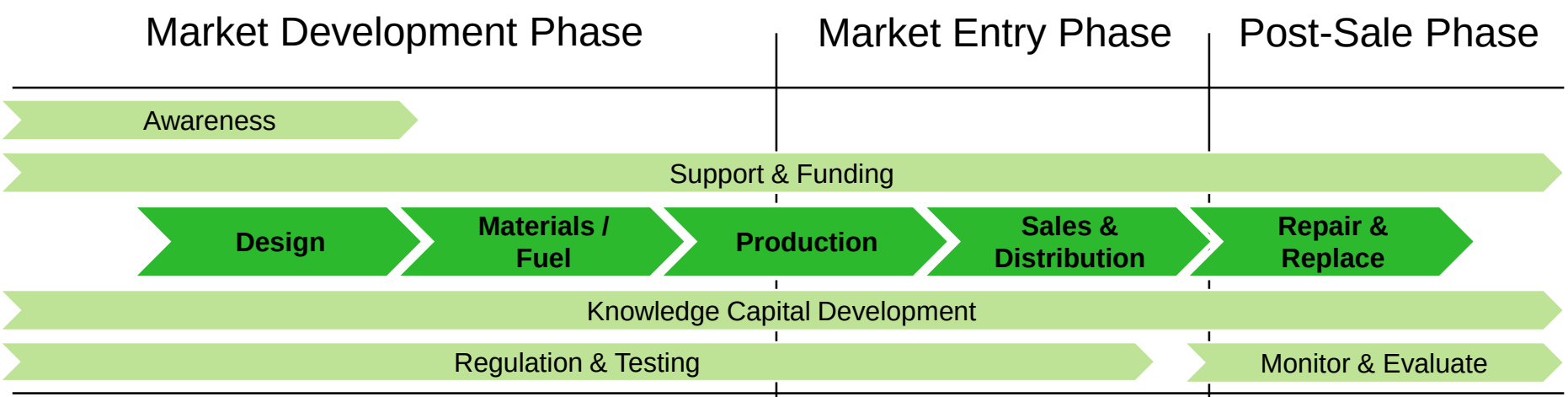
Sources: Interviews

Content

GLOBAL ALLIANCE FOR CLEAN COOKSTOVES

Intervention Options Roadmap Overview

The Cookstove Value Chain is a sequential process, and contains interdependencies. Similarly, the Enabling Environment Framework components should be done in conjunction with the value chain.



1. Share best practice from different geographies and initiatives from other sectors
2. Introduce standards/ regulation for cookstove components
3. Establish & enforce a formal certification scheme for trained masons
4. Raise awareness at the national level
5. Create favorable market conditions for private companies
6. Improve accessibility for clean fuels
7. Extend the reach of the campaign to build a comprehensive tracking tool
8. Promote communication and coordination between local authorities

1. Encourage implementers to include maintenance plans/warranties
2. Improve access to key components
3. Train additional technicians in other regions
4. Work with private sector companies to encourage more ICS initiatives

1. Promote follow up support from certified technicians
2. Encourage carbon financing to fund maintenance

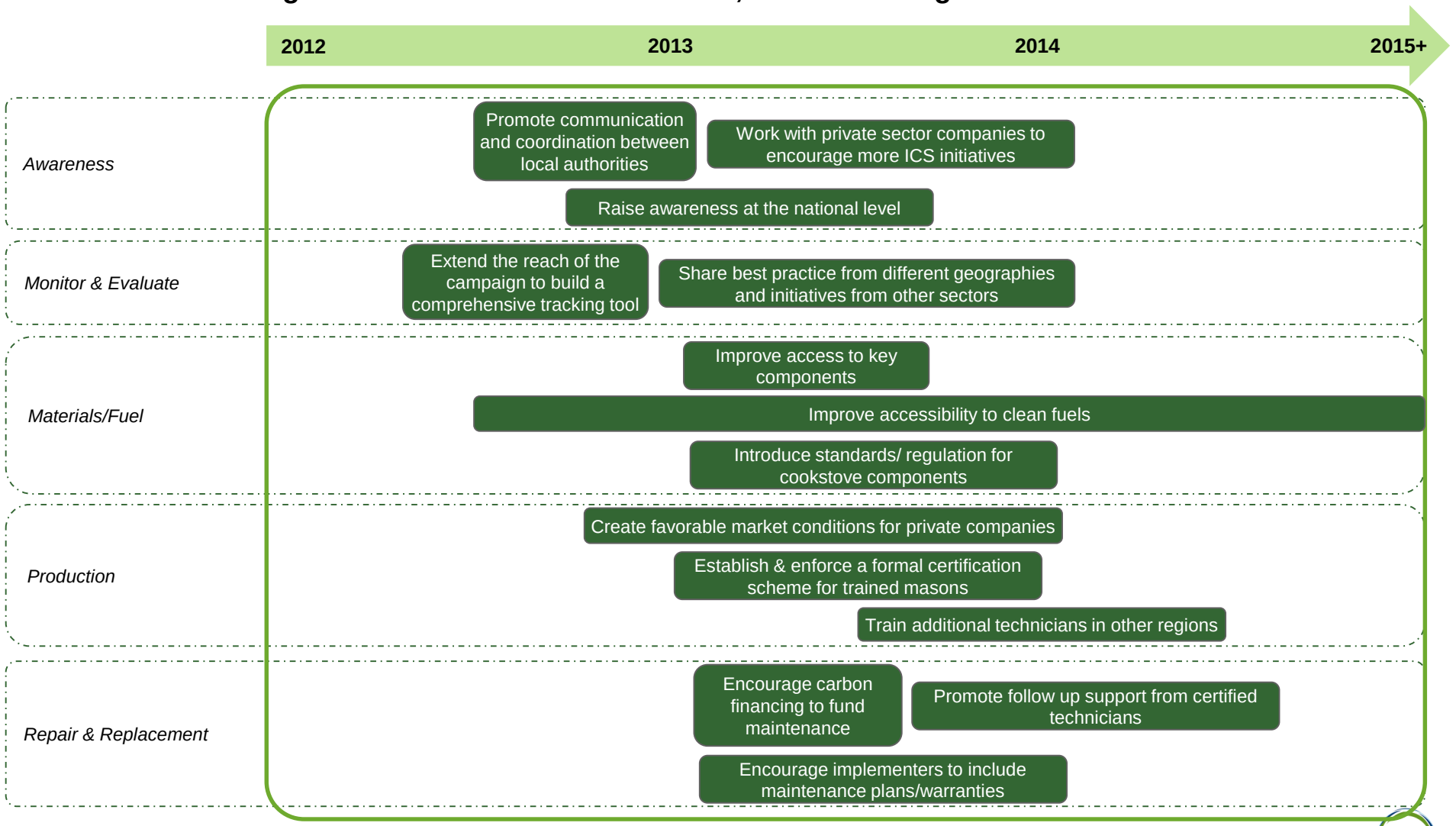
Key

- Cookstove Value Chain Component
- Enabling Environment Framework Component

GLOBAL ALLIANCE FOR CLEAN COOKSTOVES

Intervention Options Roadmap

Intervention options will focus on cultivating a market-based environment for cookstoves, supporting manufacturers to get their cookstoves to end users, and sustaining the market.



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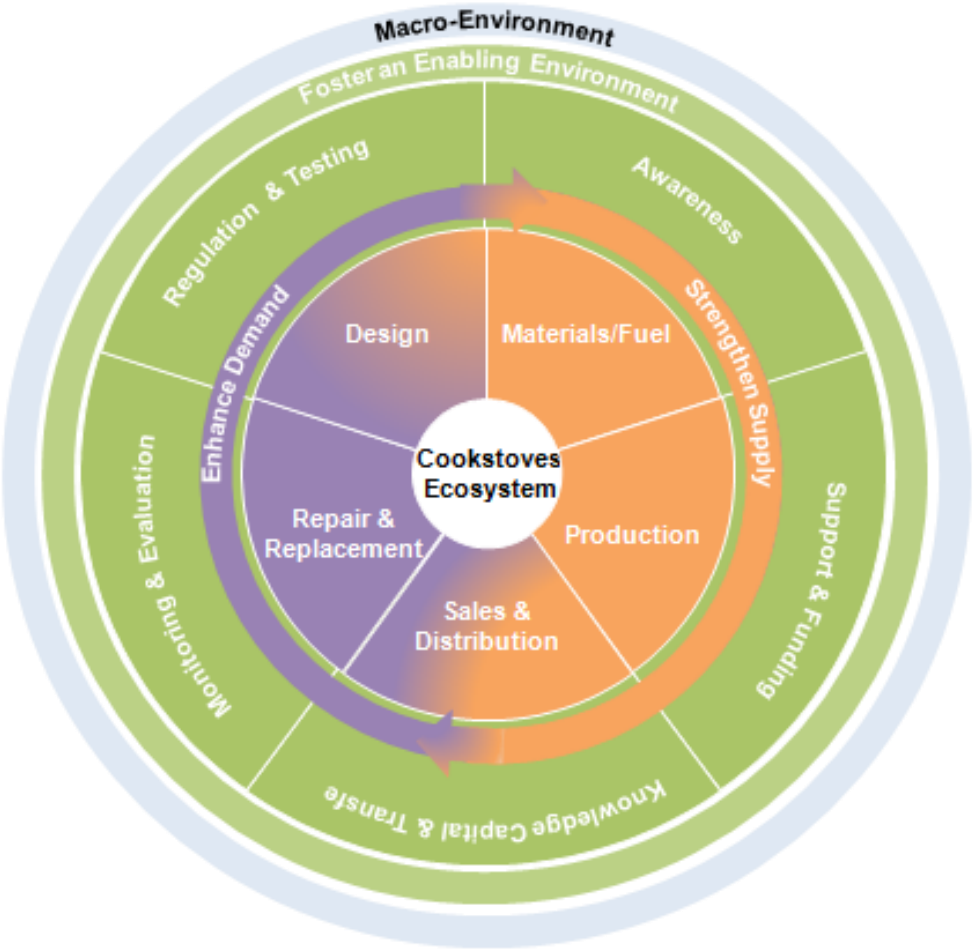
GLOBAL ALLIANCE FOR CLEAN COOKSTOVES

Conclusion

In Peru there are numerous large scale ICS projects within the NGO and public sector, with a notable absence of private companies. The long term viability of current initiatives remains unknown.



Macro Environment

- Peru has 7.6 million households, with approximately 2.6 million of them suffering from IAP
- There is considerable momentum within the NGO and public sector, with the "*Medio millón de cocinas mejoradas*" campaign as driving force
- Considerable funding is potentially available, although 'free stove' projects have hindered the private sector

Enabling Environment

- The central government is aware of the ICS drivers, but the local government less so. Consumer awareness is driven by implementations, resulting in many communities being uninformed at present
- Monitoring and evaluation is a key gap which much be addressed to ensure projects are sustainable

Cookstoves Value Chain

- The materials used for stove production should be subject to standards and more work is needed to improve both supply and demand of clean fuels
- While most initiatives train technicians, the geographic scope of the projects and quality assurance need to be addressed
- Current mechanisms for stove maintenance are not satisfactory, with households often expected to take ownership of unfamiliar technology

GLOBAL ALLIANCE FOR CLEAN COOKSTOVES

Content

GLOBAL ALLIANCE FOR CLEAN COOKSTOVES

Case Study A: National ICS Campaign

- Organization: Multi-organizational (20+). Initiated and led by GIZ/ EnDev
- Region: Nationwide
- Stove/Fuel/Price: Various
- Overview: June 2009 – December 2011: Por un Peru sin humo
  - ✓ 5 leading institutions within the ICS sector formed a central nucleus (Endev-GIZ, ST-CIAS, Juntos, OPS, ITYF)

- Funding:
  - ✓ 2 government institutions sponsored this initiative politically (STCIAS & Programa Juntos)
    - currently being restructured (impact unknown), they don't build stoves, but did help to build the framework
- Stoves Distributed:
  - ✓ 223,575 across all members
- Best Practices:
  - ✓ Created a central location to capture program results/strategies/best practice and track progress
  - ✓ The strategy was to influence actors that have power of influence in the public agenda, now that the issue is institutionalized and in the public consciousness, the strategy is being redefined (due July 2012)
  - ✓ Pre 2008 the country lacked data regarding the health impacts, this was the campaign's top priority
  - ✓ Projects must use certified stoves – proven improvements in emissions, energy efficiency and safety
  - ✓ Use community leaders to reach households. Train women identified by the *Juntos* program
  - ✓ Run small media campaigns through radio (e.g. government of *La Libertad*) to ensure the correct use of the stoves
  - ✓ Value previous knowledge/resources developed by each campaign participants ("*la suma de esfuerzos*")

Case Study B: Carbon Financing

- Organization: Microsol
- Region: Nationwide
- Stove/Fuel/Price: Various
- Overview: Social business established in 2007 (partnered with myClimate in 2009)
- Funding:
  - ✓ May 2011: Qori Q'oncha achieved its first verification under the Gold Standard, generating its first credits in October 2011, delivering >$ 660,000 to local partners
  - ✓ Launched Qori Q'oncha PoA – using carbon markets to lower the price of ICS
  - ✓ PoA is under the VCM Gold Standard, but was accredited by a UN auditor (2010)
  - ✓ 2010: Microsol diversified, supporting developers of ICS, biogas digesters, solar panels/heaters, micro-hydroelectric stations, water filters, etc. using carbon markets
- Stoves Distributed:
  - ✓ Approximately 85,000 across Peru via strategic partners - public and private
- Best Practices:
  - ✓ Greatly increased access to carbon markets for cookstove implementers (75% of the money from the carbon credits goes to the implementer): provide support to projects pre and post implementation; perform 80% of the work needed for organizations to join the POA – complexity and cost are key concerns for implementers
  - ✓ Qori Q'oncha program ensures health and environmental improvements are realized by imposing the following criteria: proven firewood saving, use of local materials, chimney
  - ✓ Keen to fostering the cookstove market: currently lead the Alliance's Carbon Credit Risk group, perform studies to support their activities (e.g. Forestry, Social Impact, Additionality, etc.)
  - ✓ Assisting a large percentage of the market (90% of organizations currently distributing ICS in Peru)

Case Study C: In Situ Stove Implementation

Appendix

- Organization: GIZ/EnDev
- Region: Nationwide
- Stove: Inkwawasi (9 models – with/without chimney, firewood/dung)
- Price: Variable
- Funding:
  - ✓ German, Dutch and Norwegian government fund GIZ
  - ✓ Local municipalities provide financial support
- Stoves Distributed: 100,000 Inkawasi stoves
- Best Practices:
  - ✓ Well designed stove (worked with SENCICO), claim if well-maintained and correctly used, can save up to 62 % of firewood compared to an open fire
  - ✓ Quality assurance process in place: stoves built by trained technicians, follow ups ensure correct stove use and maintenance
  - ✓ The family must contribute time and money (building the adobe base, technician, basic materials) to ensure buy in (means tested)
  - ✓ Project provide key materials: chimney, grill, stove top and special bricks for the combustion chamber (120-180 soles)
  - ✓ Regions/households are selected using the SISFOH report
  - ✓ The project requires that the stove is built in an enclosed area, which is kept clean and meets basic hygiene requirements e.g. no livestock kept in the kitchen






Case Study D: Portable Stove Design

- Organization: Cocinas Mejorades Multiuse JCS
- Region: Cajamarca
- Stove: Portable metal stoves and in situ combined/water heater systems
- Price: Portable stove = 650 soles; fixed stove/water heater = 1,000 soles
- Funding: Self funded, lacks capital to expand. Local Catholic church provides business tuition since he won the RampPeru Entrepreneur Prize in 2007
- Stoves Distributed: 400 portable stoves (200 to individual families, 200 via a mining company); 800 fixed stoves with CARE; *4000 stoves in total*
- Best Practices:
  - ✓ Innovative approach, not many producers of portable stoves (he is only one in the Cajamarca region)
  - ✓ Looking for a holistic solution – offering a built in water heater for households (there is considerable interest in this, but the cost is prohibitive for most)
  - ✓ Shows that a market approach can work (presumably for those outside the bracket being reached by NGOs/Gov.)
  - ✓ Keen to scale up, but lacks confidence due to his poor education – he was acutely aware that this restricted him

Case Study E: Stove Parts Supply

- Organization: Industrias Yopia – started in 1994, started working with stove producers in 2010
- Region: Cajamarca
- Stove: Produce parts for the in situ stove: chimney, grill, stove top
- Funding: Self funded, machinery and capital remain limiting factors.
  - ✓ Municipalities often delay payments by up to 3 months
  - ✓ Can obtain loans – maximum is 50,000 soles; 3-4% interest (Banco Edificar)
  - ✓ When they win a tender, they need to place a deposit in the bank as a guarantee (standard practice nationwide)
- Best Practices:
  - ✓ Have streamlined the business to enable them to scale up once funding is available
  - ✓ Differentiate themselves by ensuring high standards/quality assurance. This has been key to winning support from implementers. The company invested time to learn about the stoves, how they work and why the measurements are critical and hence are conscious of the importance of the specification
  - ✓ They guarantee to distribute the stoves to all areas. This cost is factored into the bid, they may need to subcontract this out when the rural communities are very remote
  - ✓ Employ women (despite prejudices); 15 men/4 women (women typically do the less physically demanding work e.g. chimney tops). The husbands do not support the women working in this type of job, but they remain due to the income (20 soles/day)

Case Study F: Innovation: Livestock Financing ICS

Appendix

- Organization: CentroECO/Winrock/USAID
- Region: Rural district of Inkawasi, Lambayeque
- Stove: Inkawasini Stove
- Price: 377 of the stoves were bought using the livestock micro-financing
- Funding: 413 (by September 2007)
- Stoves Distributed: TBC

- Best Practices (Micro-financing with livestock):
  - ✓ Worked with the poorest in Peru, who had very limited/no access to money
  - ✓ They created a micro-loan influenced system using livestock. They gave the families guinea pigs/chickens and then took the first two litters/batches of eggs as payment for the stove and interest on the loan respectively
  - ✓ At the end of the project the families had an ICS and a source of income from the livestock
  - ✓ Men typically controlled the household finances and this approach not only enabled access to 'finance', but also removed the (sometimes difficult) men from the equation, since the women typically 'owned' the livestock
  - ✓ The project also taught improved animal husbandry techniques to the communities
- Best Practices (Competitions to raise engagement):
  - ✓ The communities they dealt with were typically very house proud and they used this to hold competitions in each community which celebrated stove maintenance/decoration
  - ✓ This strengthened the support from the community and the stoves became a source of elevated social status
  - ✓ Ensured good maintenance of stoves and kitchens were kept in a good condition

Case Study G: Household Biogas Pilot

- Organization: Practical Action
- Region: Cajamarca
- Stove: Biogas
- Price: 10m3 digester = USD500, produces gas for 2-3 hrs of cooking
- Funding:
  - ✓ Subsidised by Practical Action
  - ✓ The household requires 3 cows (20 kg of dung) and access to water
  - ✓ Residents installed 4 polyethylene bio-digesters as a pilot
- Stoves Distributed: 30
- Best Practices:
  - ✓ Innovative solution to the issue of household energy supply
  - ✓ Bio-digesters were changed to a polyethylene geo-membrane, due to the poor quality of polyethylene which is marketed in Peru
  - ✓ Working with the Bolivian and Peruvian government in this pilot study to access the long term scalability
  - ✓ Colaborative study, working with: Ingeniería sin Fronteras, UPC University, GRECDH), Investiga and Green Empowerment
  - ✓ Access to financing is a major barrier
  - ✓ If there is a market, they are proposing that the program may finance 25% of the costs





Pictures kindly provided by: Practical Action