# DOUTDERS OF ACTIVITY IN CAMBODIA

PEOPLE Brand New Khmer

## **BRAINWORK**

Carbon Finance : the development lever

OPINION Biomass: energy that grows

INSIGHT Strenghtening 300 getors

# **REACHING 3 MILLIO**

How GERES managed the up-scale of the Improved Cookstove Program





## EDITORIAL

#### A different story

It is not uncommon for promising programs to struggle to get past the microproject stage owing to many different factors, including lack of funds, resources or support, or simply that the circumstances are not right.

Today, our story is different. We are taking you to Cambodia to tell you about a *true success story.* 

In 1996, the *Groupe Energies Renouvelables Environnement et Solidarités or Renewable Energy, Environment and Solidarity Group* (GERES) started designing a program to disseminate improved cookstoves. Our goals were: to create added value for the Cambodian household; to help organize the market with consideration to local customs; to invest in local players through transfer of our technical expertise; and to monitor the impact of the system that we had put in place.

### As of today, we have distributed more than 3 million improved cookstoves in Cambodia.

We want to share our story – both strategies and challenges – with you through this magazine. As an organization whose research and innovation are geared to serving people, we believe that development is first and foremost a human venture.

In the succeeding pages, you will discover how we developed the **technical strategy of the project**, how we collaborated with various players – producers, distributors, users – in the region where we operate. You will learn about our approach to **logistical strategy**, and how spreading our technology by relying on an existing structure of autonomous producers and distributors allowed us to build a solid foundation for a long-term enterprise.

To reach scale, we had to source funds. You will see how **Carbon Finance** allowed us to boost the production of improved cookstoves and made this project even more ambitious, impactful and global. It is rare for a non-government organization (NGO) to be given access to Carbon Finance; GERES has been the first NGO to enter the carbon market with a cookstove project. The incurred costs had been heavy and the process had required solid expertise in the areas of economics, engineering and development strategies. But after making some necessary adjustments, we were able to reach this milestone which changed the course of our project in the process, and ultimately accelerated its expansion.

Finally, I would like to stress that the success of this project is the result of a collective, intelligent effort of all the actors involved: government support, cooperation of both producers and distributors, and the determination of the entire GERES team, have all been essential to make this achievement possible.

Through this magazine we hope for you to immerse in the extraordinary stories of our teams, who day-by-day welcome new participants, collaborators and partners.

Yes, promising programs rarely go beyond the status of a micro-project. But today, we have a different story to tell. And through this unique story, we hope to bring inspiration, guidance and lessons for any other development organization that may wish to embark on a similar venture.

Alain Guinebault General Manager of GERES

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Printed with support from the Blue moon fund September 2014

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#### **IMPROVED COOKSTOVES**

The 2.5 billion people globally who rely on solid biomass for cooking mostly use inefficient and polluting devices. Burning biomass on inefficient cookstoves leads to a series of negative impacts on environment and health. A technological solution to help mitigate the negative impacts associated with biomass cooking is the use of Improved Cookstove – a cleaner and more efficient cooking device. Members of the international community are working together to increase access to clean cooking energy solutions and aim to provide 100 million households with cleaner cookstoves and fuels by 2020.

#### LANDMARK

## **CAMBODIA** The starting point

Overview and foreword

Cambodia boasts a long past. At once glorious and dark, Cambodian history stretches all the way back from the magnificent Angkor era in the ninth century up to the drawn-out civil war years of the 1970's. The capital of the Kingdom of Cambodia and home to 1.5 million people, Phnom Penh is located in the southern part of the country, at the junction of the Tonlé Sap Lake and the Mekong River. The country lies completely within the tropics, lending itself to a monsoonal climate with marked wet and dry seasons.

#### OVERVIEW

Cambodia is located in the Indochina Peninsula in Southeast Asia. It is bordered by Thailand to the west, Laos to the north and Vietnam to the east. To the south, the 443 kilometers (275 miles) of coastline overlook the Gulf of Thailand. Cambodia's landscape is mostly characterized by plains, surrounded by uplands and low mountains. About 75% of the country is located on the Tonlé Sap, the combined lake and river system situated in the heart of Cambodia and supplied by the massive Mekong River, the main watercourse of the country.

#### SOCIO-ECONOMIC CONTEXT

In 1993, Cambodia ended its 20-year civil war. The country began its reconstruction and the population reorganized in the cities evacuated during the war. Twenty years later, the nation has succeeded in significantly reducing the percentage of people living below the poverty line, from 50% in 1992 to 20% today. 65% of the Cambodian population is under 30 years of age, representing a strength for the future.

#### LANDMARKS

#### **STATISTICS**

Geographic area: 181,035 km<sup>2</sup> (69,898 mi<sup>2</sup>)
Population: 15 million
Language: Khmer
Capital: Phnom Penh
Gross Domestic Product:
14 billion USD (2012)
Human Development
Index: 0,543 (2011)

#### **ENERGY SITUATION**

Today, over 71% of Cambodia's energy mix comes from biomass, mainly made out of wood, charcoal and agricultural waste. In addition, 80% of Cambodian families live in rural areas and use wood fuel (wood and charcoal) for daily cooking, being easily accessible and cheaper.

#### GERES

Created in 1976, Groupe Énergies Renouvelables Environnement et Solidarités (Renewable Energy, Environment and Solidarity Group) is an NGO specializing in reducing energy poverty – while preserving the environment and limiting the consequences of climate change – in order to improve the living conditions of populations.

72 projects in 14 different countries
238 professionals throughout the word
589,647 beneficiaries (families or micro-entrepreneurs)
9 million EUR of annual budget



# **BIOMASS: ENERGY THAT GROWS**



By Mathieu Ruillet. South East Asia Director of GERES

Biomass – all organic matter on earth, including, wood, charcoal, agricultural waste, and even dung – has been powering humanity for ages.

But in the late 19th century, technological advances allowed us to drill and tap into new, huge energy reserves. Access to petroleum, coal, and then natural gas and uranium triggered exponential industrial development for a small portion of humanity. We entered the exciting and highly addictive 'fossil age,' which has delivered – to really just a few of us, when one considers the portion of the total global population that has gained access to it – impressive progress riding on a depleting stock of fossil and nuclear fuels.

#### And while concern arises about the finiteness of this stock, biomass remains.

Biomass is the next global energy source after fossil and nuclear fuels. It accounts for around 10 percent of primary energy in the world – more than half of global renewable energy currently exploited. Today, one out of three people in the world uses biomass for their daily household needs: one out of two in Asia; two out of three in Africa. That's 2.5 billion of us. And the figure keeps rising.

#### The good news is - biomass does grow on trees. Literally.

Biomass is a local resource. Its exploitation can contribute to inclusive green growth by benefiting rural micro-entrepreneurs, as GERES has demonstrated here in Cambodia. Biomass remains accessible and can easily be renewable. Biomass is and can remain affordable for all, and as it is not vulnerable to fluctuating and rising global energy prices, it can be a source of a secure source of a national energy supply.

#### All of this makes biomass nature's 'stroke of genius.'

It is a reliable, poor-friendly, climate-smart asset to our global energy mix which should remain diverse. But ensuring stability of this natural energy source rests on one condition: that we burn it slower than it grows. That means – on the demand side – to consume it efficiently, and – on the supply side – to preserve the capital (forests) and to smartly develop and utilize the interests (forest products) including by looking for alternative sources, notably, from waste.

## That is what GERES strives to achieve here in Cambodia through its biomass value chain program.

The biomass value chain program aims to achieve a balance between the local supply of biomass on the one hand, and the demand from consumers on the other. This is to be accomplished through efforts to minimize adverse effects on the environment, including by reducing demand through energy-saving innovations, in order to safeguard long-term access – along with the socio-economic benefits that that access guarantees – for all. This is what we at GERES attest to be a life-changing solution for the people of the Royal Kingdom of Cambodia: modern energy access.

Enjoy reading.

Sources: Global REN Report 2012 / WHO / IEA / world energy outlook

#### **OPINION**



#### **OPINION**

## **OUTCOMES**

Support to national policy making by participating in the Wood Energy Working Group, in charge of designing a national strategy



OURCING OF BIOMASS FUELS

TER



#### His Excellency Tun Lean. Under secretary of State. Ministry of Mines and Energy Cambodia

In what way does GERES' intervention contribute to the Cambodian government's strategy for access to energy?

The government of Cambodia sees the importance of ensuring sustainability of the biomass resources in Cambodia; we have implemented a national strategy for promoting renewable energies. From the beginning, we had considered GERES' methodology to be appropriate to our local context and had given them our support to help disseminate their solutions. We have been taking their head since 1998 in developing and producing improved cookstoves. Because they care about the people, their action has transformed many social and health challenges into impactful successes - better health for women and children, time-savings that allow children to go to school, etc. Moreover, GERES' Biomass Program addresses the Cambodian population's need for access to efficient and affordable charcoal and fuel-wood, and it integrates itself with the Cambodian government's strategy for rural development.

In addition, the Sustainable Forest Management project is implemented by the Forestry (SFM) Administration of the Royal Government of Cambodia and financed by UNDP-GEF (United Nations Development Program - Global Environment Facility). For this project, GERES was chosen by the Forestry Administration to provide technical inputs on the whole biomass energy value chain.

#### What is your feeling/opinion on the success of GERES' New Lao Stove (NLS) project? What challenges do you foresee for the Improved Cookstove sector?

Because the NLS project suits the traditional cooking habits of the users, the product easily found its place in Cambodian homes. Working with a network of existing producers, distributors and retailers contributed to the efficient dissemination of the NLS around the country.

The next step is what the Cambodian government expects - the handing over of the ICS sector to the private sector. GERES' project is not finished yet; there are still many challenges to come in terms of strengthening ICoProDAC, the ICS business association. Finding funds and persuading members to stay active are also an ongoing battle.

Considering the success of the NLS, our government decided to support GERES in the development of other improved cookstoves and biomass solutions.



By Iwan Baskoro Senior Fechnical Adviror

Behind thick glasses are deep eyes that seem to see through to the depths of you. This man can handle any topic. From the casual anecdote about pottery salesmen to the most advanced concept about combustion. Meet Iwan Baskoro, the ultimate brain behind the improved cookstove (ICS) technology in Southeast Asia and find out how it all began.

Three million. That's the number of improved cookstoves distributed to date. Several prototypes had already been created and still others are being perfected. Then came Carbon Finance, which allowed the project to really spread its wings. Our technique is now recognized everywhere in the world and when I am asked for the key to success, I say «Fate. Just Fate.»

#### THE ROOTS OF SUCCESS

Have you ever shared a beer with someone at the end of the day, when everything seems remotely impossible? You're in the moment, chatting away, imagining, daydreaming... When something sparks a great new idea. I think that going for that beer was the best idea I had that day.

It was 1996. The Indonesian government had assigned the NGO I was working with for a Technical Assistance work in the Kingdom of Cambodia. I was selected and asked to manage the project in Kampong Chhnang with the mission to introduce simple technologies for livelihood improvement, including

#### MEANWHILE, IN KAMPONG CHNANG...

It first began with a promising GERES project in Kampong Chhnang that was aimed at finding solutions for energy efficiency in fish cultivation. The operations were set in the central region of Cambodia where the Tonlé Sap [a combined lake and river that can expand up to 6 times its original size during the rainy season] is the main resource for the major economic activity of the area: fish-farming.

Around that time, the European Union published a study about fish depletion in the Tonlé Sap, caused by the massive deforestation going on upstream. After analyzing the situation, GERES' engineers understood that the stakes were a lot higher than it seemed. For the majority of Cambodians, food is cooked using wood, the most available and affordable resource.

That's when and how GERES started building ideas on improved cookstove dissemination in Kampong Chhnang. simple crop techniques that would yield high performance levels with an added value. That was when fate first intervened. That famous beer I mentioned. I shared it with Jean-Francois Rozis, one of GERES' engineers. It was that random meeting that actually changed everything. We were talking about joint projects, fuel wood, the forest, and about improving the cooking devices to make them less fuel consuming. And since my mission with the Indonesian government was ending, I thought working on the improved cookstove project with GERES was a great opportunity. I didn't hesitate.

#### «RELYING ON AN EXISTING SECTOR»

We spent three years analyzing the populations' needs, the technological level of production and the existing equipment to offer a flexible solution to the local stakeholders [i.e. the independent producers Aligning with traditions GERES made the decision to not develop a new, more cost-time-efficient distribution method and structure for the NLS and NKS. Instead, it integrated operations with the existing supply chain, and had people buying their cookstoves along the road, from mobile vendors crisscrossing the countryon their motorbike or buffalo. And 3 million ICS units were sold this way.



and distributors]. In 1999, GERES introduced the «first domestic, firewood-burning improved cookstove» with the collaboration of local producers of traditional cookstove. It was named the Twin Stove.

We were making good progress and the project was developing well, when the distributors – instrumental link in any supply chain – rejected the Twin Stove, deeming it bulky, space consuming and too fragile to resist the tough road conditions of the Cambodian countryside. They were unequivocal: we have to double the cookstove sales price to make up for the constraints. Our original goal had been to provide an improved cookstove – admittedly slightly more expensive than the traditional stove but less costly in terms of wood or charcoal consumption.

Ultimately, it was that goal that united the producers, distributors and users alike. It was impossible for us to agree with the distributors and double the price; our whole reasoning would have been compromised. The solution lay elsewhere.

#### **3 ANSWERS TO SUCCESS**

#### 1997: The adventure begins

The European Union accepts GERES' first proposal and grants the organization its first EU fund in Cambodia.

#### 2002: Confirmation

Second proposal, also accepted by the European Union. This second stage allows GERES to scale-up the New Lao Stove – and to transfer the project to Phnom Penh, the Cambodian capital. 2007: Carbon Finance

Third stage: GERES' project becomes eligible for Carbon Finance, allowing the program to develop over the course of a decade. More than 3 million cookstoves were produced, the market began to stabilize and GERES started deploying its biomass program via satellite projects.

#### SUDDENLY, THE NEW LAO STOVE

In 1999, we were still in the microproject stage. The design and effectiveness of the improved cookstove was enhanced for better energy consumption. But time provided a challenge : we were half way into our EU financing and so we had to find a solution.

Then, fate intervened once again. Around that same time, an improved cookstove for charcoal burning named the «Thai Bucket Stove» has been enjoying success in Thailand and Laos. Impressive and compact, this bucket-shaped stove trapped the heat in its single combustion chamber, was stackable and allowed for optimal transport. That's how we got the idea for our second project.

#### «COPIES OF THE NLS: A SIGN OF SUCCESS!»

Inspired by the design of the Thai Bucket Stove, we adapted the model to the Cambodian context. And that's how the New Lao Stove (NLS) was

born. Then, fate happened again: The European Union granted us a second 4-year financing to sustain and scale-up our development from 2002 to 2006.

Enthusiastic about the results, an external evaluator suggested we focus our distribution on urban areas where charcoal and wood are a commodity and purchased for a price - as opposed to rural areas where wood is collected and therefore not a money expense. GERES took stock and moved to Phnom Penh, the largest urban center in the country.

#### CARBON FINANCE YIELDS RESULTS

With the urban demand, our project entered a new dimension. During the four years of our second contract with the EU, the producers had been swamped with demands for NLS. It became obvious that our improved cookstove had penetrated the market too quickly and our production facility, still in Kampong Chhnang, was inadequate to respond to this success.

We decided to train new producers and recruit new distributors, which resulted in us leaving the microproject phase and finding the right balance between output and quality. Around that same time we also set a minimum sales price among producers and distributors to foster market stability.

After making considerable efforts to regulate the market, improve processes and target a specific sector, we received our most significant reward, the clear sign of our success: in every corner of the country, our ICS was being copied, and counterfeit New Lao Stoves had made their appearance. Fine by us! In 2006, our second grant was about

#### KAMPONG CHHNANG, THE POTTERY VALLEY

Newly settled in Phnom Penh, GERES is faced with the urban centers' strong demand for improved cookstoves. To stay consistent with its goals, the NGO should choose to decentralize the production, not only in Kampong Chhnang but in all the provinces, to make sure that every part of the country is easily supplied.

Yet, the production centers kept on appearing in Kampong Chhnang. Why, you ask? Well, first, because the clay that comes from the nearby mountains of that province is ideal for the manufacturing of pottery, stoves and other clay items. But GERES also realized that the labor force and skills specifically required for this craft have been concentrated in this region for generations.



## THE NEW LAO STOVE (NLS)

This compact bucket stove combines energetic performance, transportability and ease of use. Clearly our bestseller, it was quickly adopted by all the stakeholders of our network and the end-users. (cf. details on page 20)

to end. The question arose - «What should we do?» Request more public financing? Definitely not. We had gone too far to 'lose our bet'. We were now grounded, operational in several areas and well aware of our project scope. We had to look further ahead.

The emergence of the Carbon Emissions Trading initiated by the Kyoto Protocol in 1997 gave us the opportunity to present our project with the idea of generating carbon credits. That would allow us to keep developing a long-term project without hindrance. Once again, fate intervened: in 2006, our ICS program was the first to become eligible for

#### **OUTCOMES**

98% of improved cookstove users are women the efficiency of these stoves allow them to spend less time in the kitchen and tend to other activities.

#### THE PERFECT GROWTH

NLS output growth throughout the project years. (Bar chart)





Carbon Finance for 10 years (2003-2013), allowing the organization to grow, exert influence on the sector, and begin work on a bigger biomass management program. After all, that was exactly what GERES had been here for, long before sharing that beer.

#### THE FUTURE LIES IN ICOPRODAC

And so the market was stabilized - the producers were producing, the distributors were distributing and the end users were satisfied. Our last step was to make all involved players self-sustainable. Consistent with our objectives, an association of producers and distributors of improved cookstoves was created and named ICoProDAC. This supervisory and management authority is now led by Mr. Khim Polo, Mrs. Van Tola (cf. Portrait on page 34) and other partners. We then had managed to empower Khmers to become masters of their fate.

#### «RELYING ON WHAT'S REAL»

Meanwhile, GERES continued its action with satellite projects revolving around an integrated biomass management program (cf. In Biomass We Trust, by Mathieu Ruillet page 8) and continued to strengthen that (still) fragile sector. Being experts on technical areas combustion techniques, economics, innovative training - was important, but just as important was the ability to adapt to cultural and local customs and integrate to the already existing market. What gives our project its unique character is that it is suited to the behavior patterns, and responds to the simple daily needs, of the stakeholders. We rely on what's really happening to the people. Specializing on the improved cookstove sector also means listening to and respecting people - their culture, ways of life, expectations, etc.

At least, that's what I'd be telling you if you and I were sharing a nice cold beer.

An independent producer shaping the iron bucket to fit the New Lao Stove.





A local RED team for improved solutions

Local innovations adapted to local demand. Such is the rationale behind GERES R&D team. No large-scale industrial production, no imported raw materials. Cambodian know-how and in-depth knowledge of the local environment are what it takes to come up with these home-grown nnovations. Welcome to our workshop!

It all started when developing the New Lao Stove (NLS). At that time, GERES was a small team and R&D was the center of all activities. Thanks to carbon finance, the R&D expertise grew as the GERES team and needs were growing. With a local technical team, a lab in Phnom Penh and a workshop in Kampong Chhnang, GERES has all the elements be able to propose technologies Based on available local resources and which respond to local needs. Here is a brief insight into GERES' 100% local innovations.

#### NEW KONGREY STOVE

#### Improved Cookstoves : NLS & NKS

- Grate and pot rests designed to allow sufficient airflow
- Refractory liner to reflect heat
- The NLS, a charcoal fuel urban stove. The NKS, multi-fuel stove replacing 3 stone cooking.

NEW

LAO STOVE

#### Improved Palm Sugar Stove

- Multi-fuel stove with strong post-combustion technology
- Installation of a chimney to increase draft
- Insulating plastering to minimize heat loss



#### Charbriquettes made out of recycled waste

- Biomass waste turned into charcoal residue thanks to the improved T-LUD combustion technology
- Residue transformed into char-briquettes using a mechanical extruder
- The resulting product is compact, burns longer and hotter than traditional charcoal



#### Production of sustainable charcoal: Yoshimura kiln



- A high-yield kiln, thanks to an efficient thermal insulation (1kg of charcoal obtained with 4,5kg of wood, compared to 6,5 kg with traditional kilns)
- Homogeneous and uniform charcoal thanks to optimal spreading of combustion gases through an internal central chimney

Wide opening of the kiln, allowing the operator to limit the exposures to toxics smokes and particles.

#### THE SMALL LAB GREW BIG !

The testing laboratory of Phnom Penh, better known as G-BEL (GERES Biomass Energy Lab) is now recognized outside Cambodian borders. The international network 'Global Alliance for Clean Cookstoves" has placed G-BEL among the nine worldwide references for biomass/improved cookstoves testing. While it started as a small lab dedicated to GERES innovations, it's today the reference in all southeast Asia.

#### Ensuring the quality of the product in the long run

The challenge when working with a network of independent producers is maintaining the quality of the products. GERES has developed a strong methodology with a strict control system so that users will be able to buy their ICS with full guarantee that their stove will make them save fuel.

# GH2ES OUTCOMES

## **ENVIRONMENTAL**



## ECONOMIC



joined the ICS supply chain

1.3 million of additional added value in 10 years

\$2 million of value added to the economy each year

## SOCIAL

\$38 of financial savings on fuel for each NLS (national medium income in 2012: \$39.25)

> 40% of families equipped with an ICS

# STRENGHTENING 300 ACTORS

A story by Chen Cheth. Manager of the Improved Cookstoves Project

The Improved Cookstoves (ICS) Project spans 6 Cambodian provinces. From the training of competent microentrepreneurs to monitoring of sales, the teams of GERES and ICoProDAC (Association for Producers and Distributors of ICS in Cambodia, page 22) play a unifying role and guarantee the entire sector's stability. At the top of the pyramid is Chen Cheth, ICS project manager and one of the best in his field.

#### THE SUPPLY CHAIN

Today, the existing supply chain is strongly established with essential key players: producers, distributors and users. It also includes wholesalers and retailers.

The role of GERES is linking, following, supporting, listening to all these individuals to keep them on board the project and allow the final products to be made available to endusers nationwide. But beyond building the expertise, the ICS team share a relationship of trust with every individual along the supply chain. These instrumental relationships that were slowly built over time allow the supply chain to hold together today. By thinking of an exit strategy of the project, Chen Cheth has to consider many challenges. Breaking the sentimental bond between GERES staff and all of these beneficiaries is yet the hardest one to tackle.

#### GERES INTERVENTION ON THE EXISTING SUPPLY CHAIN





**OUTCOMES** 

19% - 31% - 50%

the shares of the selling price going to the purcha<u>se of</u>

**BEING CHEN CHETH** Esteemed by his colleagues, calm and tactful, the ICS project manager personifies Khmer serenity. He joined the NGO 10 years ago, and not only is now at the head of 21 GERES employees, he also oversees the 300 key players of the improved cookstove supply chain: producers, distributors and retailers. In Kampong Chnang, his hometown, Chen Cheth reveals the complexities of the Improved Cookstoves Project.

#### SECURING THE SECTOR WITH QUALITY PRODUCTS

In a country where counterfeiting and copying is often too easy, it is truly challenging to maintain product quality. In this regard, the Quality Control Label is a guarantee of a set of uniform processes and is a visual representation of the manufacturing standards followed by all producers.

#### MONITORING AND COUNTING

Since the beginning of the project, GERES has implemented a precise system to monitor the manufacturing and sale of NLS and NKS cookstoves. This process is what had allowed the NGO to meet the criteria for Carbon Finance eligibility. Today, producers who faithfully apply this system receive financial compensation to guarantee healthy work routine.

Such is their success that Cambodia has become a textbook example for the improved cookstove implementation in developing countries. The goal is for monitoring to continue, and for ICoProDAC to become an able representative of the sector that will help secure the sustainability of the supply chain. Currently, only the stove distributors have knowledge of the improved cookstove buying and sales trends; the goal is for ICoProDAC to eventually pick up the torch in terms of market monitoring.

#### GERES STIMULATES THE MARKET

When the NLS and NKS were launched, a large promotional effort had been necessary to encourage sales. Today, while word of mouth allows the ICS market share to keep expanding, it is still crucial to stimulate the market through communication campaigns. This last stage will be challenging to handover to ICoProDAC, considering the association's resources.







## INSIGHT SHE SAID IT



SOPHAL PAET, 27 User of NLS and NKS

What makes the NLS better to use for you? It is easier to cook because

there is a lot less fumes. Before, I had to wear a mask because of the fumes, and yet it was still difficult and time consuming to cook. The most important is that I use much less fuel.

## Why do you use both types of improved cookstoves?

I use each stove for different purposes. I like to cook on the NLS – it's bigger and more convenient. I can also cook longer since the NLS requires very little charcoal. However, charcoal is more expensive than wood, that's why I would rather use the NKS to boil water, for example.

## Have you calculated your savings so far?

I buy charcoal to cook with the NLS. I use about 2 kg [or 4.5 lbs] of charcoal per day, which costs \$0.5/day. I also use 2 packs of wood per day, which amounts to close to \$0.25/day. Before that, I would only use wood – 20 packs or \$3/ day. I have cut down my fuel expenditures to 25 percent of what I used to spend.



#### By the Editorial Staff

Today, GERES is focusing its efforts on a new phase of the ICS project:Handover of all activities and systems that have made the sector the thriving sector that it is today to the local actors. The goal is to complete the handover by 2017.



While training and supporting independent producers and distributors, GERES initiated a plan to structure the ICS sector.

The creation of ICoProDAC (Improved Cookstove Producer and Distributor Association of Cambodia) was envisioned by the ICS project team in 2004 with the purpose of gathering all the sector's microentrepreneurs to ensure the industry's growth, while maintaining quality as well as market prices stability.

#### 49%

The proportion of women among all stakeholders in the improved cookstove value chain. GERES sees gender equity as a success factor of its projects. Women's resolve to be part of the ICS program is marked by key actors like Vann Tola, head of the biggest production center in the country. (Portrait page 34)

## NOW COUNTING 287 MEMBERS

Khim Polo, the new president of the association and himself an ICS distributor speaks of continuity, *«Our products are high quality and must remain so, and we must take over GERES lead by monitoring the entire sector so it may be profitable to all.» While in the past they had been village potters and distributors without a network, the 287 independent entrepreneurs of the New Lao Stoves (NLS) and the Neang* 

Kongrey Stoves (NKS) now benefit from a nationally recognized brand and have increased their income accordingly. For its mission, the ICoProDAC, led by its President "seek to ensure product quality and the market value, by enforcing the labeling system" and shall decide on the necessary strategic directions to boost sales and increase the products' penetration rate in the market. The Economic Pillar cooperative, funded by the members, allows access to favorable interest rates. As of today, 37 entrepreneurs have benefited from a loan to invest in and further develop their business.

#### THRIVING FREELY

With the objective of reaching full autonomy by 2017, the young association needs today to find its own path: to have a strong governance with the ability to maintain relationships with public institutions and a sustainable financial model and well trained members or employees to take over GERES daily support.

ICoProDAC still has a long way to go to reach this complete autonomy.

The Training and Expertise Development Action Plan that would help facilitate a smooth transfer has already been thought out and is currently in the fund-raising phase.

#### ICOPRODAC'S AGENDA

1. The 15 members of the Executive **Committee** meet with GERES every auarter to decide on pricing, quality and value chain related issues and news items concerning the association.

2. The General Assembly meets every fourth month to discuss relevant matters to the sector The latest production figures, some code of conduct/quality standard reminders and the decisions taken by the Executive Committee, are also presented to members during this assembly.

3. An Exceptional General Assembly meets every other year to elect new committee members.





KHIM POLO, 47 DIstributor, President of ICoProDAC

## Do you work with several producers?

After I started working as an improved cookstove distributor and joined ICoProDAC, my wife decided to follow GERES' training to learn to become an NLS producer herself. From there, of course she became my favorite NLS supplier! However, I do work with other producers who supply me with NKS.

#### How do you organize your sales?

Each month, I go on a 10-day tour, from Kampong Chhnang to Battambang. I mostly sell the cookstoves on the road, in rural areas. Once I arrive in the city, I often don't have that much products left to sell.

#### What has your income been so far?

I've been making more money since I started selling improved cookstoves; my monthly profit is about \$100. But I work together with my wife. On her end, she produces enough cookstoves to supply many distributors and she makes a monthly profit of about \$125.

## You are now the president of ICoProDAC. What are your responsibilities?

We need to collect feedback from our colleagues and the end-users to improve the ICS sector. We maintain quality control and if needed, we give refresher trainings to the producers.



#### BRAINWORK

# CARBON FINANCE

The Editorial Staff

Carbon Finance was developed in the early 2000s as direct result of the Kyoto Protocol which was born out of an increasing alarm global over environmental concerns. Carbon Finance offered what most development projects lack: a long-term financial support, Over a 10-year period. Carbon Finance was the trigger that set off the NLS project's expansion, and the development by GERES of an integrated biomass program in Cambodia.

#### THE KYOTO PROTOCOL

In December 1997, the Kvoto protocol - the international agreement on climate change - was adopted. This treaty sums up the goals and actions to be implemented to reduce the greenhouse gas emissions of 198 countries.

The direct consequence of the treaty was the creation of a new international value, the tonne of carbon dioxide (tCO<sub>2</sub>eq) and the opening of carbon markets - regulated or voluntary - trading tCO<sub>2</sub>eq around the world. Deriving from the market mechanisms of the Kyoto Protocol, Carbon Finance aims at fostering investment in greenhouse gas-saving enterprises or products. Saving 1 tonne of carbon dioxide actually pays off!

The NLS project in Cambodia was the first of its kind - as an improved cookstove dissemination project - to be able to access the carbon market and sell its carbon savings (credits). When economic and environmental considerations meet on a global scale, development projects get a boost.

#### ACCESS TO **CARBON FINANCE**

After flawlessly organizing the project in its early stage, GERES implemented a thorough monitoring and evaluation system to calculate the emission reduction impact of the NLS project: about 1 tCO2eq saved per stove. In 2007, the project was verified under VCS (Verified Carbon Standard) and the NGO saw the door of Carbon Finance open: a 10-year funding, retroactive from 2003 to 2013, for a 10-year action plan on the field. This awesome experience, which nevertheless had its obstacles, allowed GERES to scale up the ICS project: training new producers and distributors, flooding the Cambodian market with the NLS. designing the NKS. These funds also allowed the emergence of a more general biomass program: ensuring the population is long-term access to biomass by maintaining a sustainable offer in fuel wood and by

helping the families reduce their energy needs. Although GERES originally started with a microproject, Carbon Finance allowed the NGO to start acting on several levers of development.

Today, the carbon crediting period is over. But the ICS adventure is far from reaching an end. After being funded through global markets, it is now time to fully include the project in a local business model. By transferring the supply chain management to ICoProDAC, GERES' goal is to rely on self-generated funds and to make the value chain 100% local, independent and sustainable.





#### BRAINWORK



## **GERES' FEEDBACK**

After 10 years of experience in carbon finance, GERES looks back on the experience to give few tips to future project holders.

# TOPS

#### Undedicated funds

#### Planning activities ahead

This funding was carried out over a 10-year period, and funded long-term programs. It encouraged investment, management and innovation, unlike ODA short-term fundings. While we couldn't control market fluctuations and market price over the 10 years we could still

## **FLOPS HEAVY INVESTMENTS**

#### A costly technical expertise

The entire process is first and foremost a specific and highly technical process. Costly expertise was constantly needed for the projects to be validated, and the certifying organizations. In our case, from 2007 to 2013, the DOE bureau carried out 8 full verifications to track credits. Therefore, it's recommended to evaluate the project's long-term viability before embarking on it.

#### Vulnerable to market fluctuations

on sales price uncertainty and fluctuations. Hence there is difficulty to make budget forecasts based on a young market that still seeks stability.

#### BRAINWORK

## VOLUNTARY OFFSETTING A BRAVE NEW WORLD

#### With Renaud Bettin and Auria Poirier

Kyoto happened. Economically speaking, the idea was to translate the "polluter pays" principle in a global market regulating CO<sub>2</sub> emissions. This market settled quotas and a "Greenhouse Gas Emission (GHG) trade" for countries unable to reduce their emissions. Today, we are living the "after Kyoto" era where alternative actors decide to compensate their own emissions by financing carbon free projects. Welcome to this brave new world.

The idea worked its way through. Around the world, economic players, mostly companies, realize that carbon offsetting is more than just a requirement. Reducing and compensating your GHG emissions while integrating it into your business model can be quite advantageous. Today companies and customers are looking for a serious engagement of all actors in this cause, in something more than just "greenwashing".

## WHY THE NEED FOR OFFSETTING?

The voluntary market, where carbon credits are freely and easily traded, was created alongside the compliance market. This voluntary market represents the businesses, organizations, institutions and even individuals who are willing to voluntarily compensate for their GHG emissions. Because southern populations are more affected by climate



Figure 2 - Climate solidarity by CO2Solidaire

change, carbon offsetting by the northern nations generates funds to invest in low-carbon development projects and help population already suffering from the effects of climate change. Carbon offsetting has a global positive impact only if northern countries first take action to reduce their own GHG emissions. Offsetting should remain the second step.

#### **CO<sub>2</sub>SOLIDAIRE, THE TOOL**

The CO<sub>2</sub>Solidaire program is the first voluntary carbon offsetting platform launched in France in 2004. It is a way for businesses, communities and individuals to offset their emissions co-funding bv climate solidarity projects (Figure 2). GERES, a forerunner in this field, established the program when the ICS project's institutional funding was coming to an end and was seeking innovate financing solutions. The voluntary offsetting platform CO<sub>2</sub>Solidaire offers services such as the calculation of CO2 emissions (for individuals or organizations), advice on how to reduce one's environmental impact and the opportunity to support a carbon-related project, such as the NLS project in Cambodia.

#### COMPLIANCE vs. VOLUNTARY MARKET

The compliance carbon market is the GHE emissions trade zone for businesses, the target being to reach the goals set by the Kyoto protocol. This is the cap & trade principle: an entity exceeds/saves its GHG emissions quota, and they can then buy/sell allowances. (Figure 1).

In contrast, the voluntary market is the exchange of carbon credits without the demanding frameworks, allowing for smoother administrative processes. International standards are given to each type of credit. The best known are the Gold Standard, the VCS and the Social Carbon.

#### Looking beyond...

While carbon funds were used to develop the ICS sector, they also allowed the GERES team to grow and new experts to enter the team. While structuring the ICS sector, these specialists realised that there was a strong need to look beyond stove efficiency and into the sourcing in fuelwood and charcoal. Today, GERES has developed programs to promote sustainable sourcing and the production of efficient charcoal.

#### BRAINWORK

## NEXUS THE RESOURCE

With Raphaele Deau former manager in charge of partnerships. Nexus

Originally envisioned by GERES, Nexus was born in 2008 from the alliance of eight NGOs specializing in carbon issues with the purpose of helping its members' projects expand or be replicated. In short, Nexus assists the 21 NGOs affiliated with the carbon market.

#### KYOTO PROTOCOL AND ACCESS TO CARBON FINANCE

Following a flawless organization and a subsidy from the World Bank who seek to support environmental projects, GERES implemented an emission reduction tracking system for the NLS project. Over the first 2 years, the numbers spoke for themselves: <182,402 tonnes of CO2 equivalent were accounted for. This amazing funding opportunity and experience inspired GERES to create a dedicated structure to facilitate access to the carbon market and allow development projects to expand. Nexus, today independent, supports and assists all NGO with carbon-funded projects on the commercial and financial aspects.

#### SELLING CARBON CREDITS

The market relies on true sales expertise: fair sales price for fair offsetting. Raphaele Deau, describes the process: «First, you open a carbon ledger, like a bank account that keeps track of the carbon asset transactions of each buyer and seller. Obviously, Nexus must keep up with the market and the carbon credit sales prices. On the voluntary market, the prices can range from \$1 to



**Did you say Carbon Credits?** One carbon credit equals one tonne of CO<sup>2</sup> saved (meaning avoided) for an environmental project.



social responsability, individuals seeking voluntary offsetting \$120 per tCO<sub>2</sub>, depending on the type of project. After that, both parties negotiate and agree on the quantity and sales price. A contract is signed, representing the official transfer of the seller's carbon credits in exchange for the buyer's payment, who will then be able to keep those credits or resell them.»

#### THE ENVIRONMENTAL IMPACT IS NO LONGER ENOUGH

The certification and validation of carbon credits requires many expensive administrative procedures. Nexus offers its expertise to members who are on the way to certification. As the market today can no longer offer the same guarantees on the carbon credit sales prices, the projects need to respond to even more stringent criteria to sell their credits at the best possible price.

If environmental impacts are a given for these projects, social, economic and even institutional impacts are also taken into account by quality labels. These quality labels (Gold Standard, VCS, etc.) require tougher specifications in order to increase the credit value. An additional guarantee that comes at a cost, as the verifications can get very expensive. But the better the standard, the higher the sales price !

#### FORWARD

## GREEN GROWTE BUSINESS SERVING THE ENVIRONMENT

#### By the Editorial Staff

*Green Growth. Recently, the Green Movement started combining environmental focus with The generation of economics value economic value. Let's dive into this Green model.* 

#### **ENVIRONMENTAL PROJECT**

- GERES Improved Cookstove Project Large-scale dissemination of domestic cookstoves requiring less wood and coal, contributing to a slow down of deforestation.

#### **ADDITIONAL IMPACTS**

#### - Social impacts

Employment, better quality of life, time savings - Institutional impacts National environmental policy, new

interprofessional organizations

#### CREATION OF ECONOMIC VALUE

- Economic impacts New businesses, small businesses increasing their activities

**Development is no longer a matter for a handful of eccentric engineers** exploring a microproject under a mosquito-infested tent in remote Africa, equipped with only a water bottle, a pocket knife and a few dollars.

HOW

/ORK ?

Coined 15 years ago, Green Growth expresses a new development strategy that aims at serving people and the environment, and fostering better livelihood while generating economic and social growth. Development requires taking into consideration many different aspects – environmental, economic, social, funding sources, long-term impact, and the transfer of solutions to local populations and stakeholders. Times have changed and we can now reconcile economic growth, profit and employment with an environmental approach. Why not introduce the idea of a sustainable environmental project that can generate a strong socioeconomic value? Or even the idea of furthering development through one's own company?

GERES decided to follow this model by upgrading, managing and structuring an existing private value-chain, creating jobs and building the capacity of new entrepreneurs. In 2013, the NGO helped over 1,300 entrepreneurs worldwide grow, using green solutions that met the population's needs. Through its action, GERES seeks to develop a still vulnerable economic fabric by fostering incomegenerating activities for the poorest and improved products to the bottom of the pyramid (improved charcoal; improved cooking devices etc...). Through its biomass management program, GERES is promoting a sustainable green and economic growth.

# MADE IN GERES

By the Editorial Staff

**«We are the innovating pioneers for the local private sector**». Alain Guinebault, General Manager of GERES, thus sums up the NGO's trademark which has local economic development as the focus of its interventions. GERES' impact solutions resonate in the private and/or public sector. These words also express the NGO's resolve to capitalize its carbon funds by investing in the research and development of new pilots, in line with the biomass program. GERES designs and tests innovative solutions that support a sustainable business model, which private companies, partners or even public organizations can repeat and develop. Let's meet the stakeholders riding GERES' wave!



#### SGFE (Sustainable Green Fuel Enterprise)

Resulting from a unique partnership between GERES (environmental NGO) and Pour un Sourire d'Enfant (PSE, social NGO for child protection), SGFE is a factory manufacturing briquettes made only with recycled materials. Producing biomass fuel with no impact on forests, this business has been running independently since 2012. Beyond producing an environment friendly product, SGFE is a model of social success. SGFE's employees, selected among the most vulnerable families by PSE, earn a salary 25% higher than the average national salary and send their children to school thanks to study programs implemented by the social NGO. On May 22, 2014, Carlo Figà Talamanca - current manager of SGFE – was awarded the prestigious International Ashden Award for his strong economic, environmental and social impact-generating project.



## SFM PROGRAM

The flagship project in Cambodia since 2012, Sustainable Forest Management (SFM) program represents what the NGO seeks to achieve: local authorities taking ownership of GERES' solutions. This UNPD-GEF funded project belongs to the Forestry Administration of Cambodia and aims at deploying biomass conservation activities in four provinces. The Forestry Administration turned to GERES to implement the solutions that the latter had developed over the past 20 years: improved cookstoves manufacturing, woodlot management and sustainable charcoal production. However, GERES' concern goes beyond on-site implementation. They must secure the sustainability of the project and transfer the projects methodology. To do so. GERES is training the Forestry Administration's local teams to duplicate its models with complete autonomy, expecting a larger replication in the future.

## SOVANNAK ENTERPRISE

Originally, the idea was to produce efficient and improved cookstoves to enhance farm-scale production of palm sugar. In 2010, GERES developed a new in-house commercial brand, Sovannak Palm Sugar, and began distributing this high quality, environment friendly palm sugar. The business had been running for a couple of years when GERES decided that it was time to transfer it to the private sector. After a six-month incubation and intensive training, Narein Sourn – former GERES employee - took over the small business and progressively became an independent CEO. The business is now showing very positive results and continues on its healthy growth.

(Narein Sourn Interview, p.35)



#### FORWARD

## **OUTCOMES**

6,457 has

of forest land under a management plan to augrantee its regeneration

improved cookstove

sustainable charcoal

## OUTCOMES

52,500 kg of sugar produced

\$78,680 in sales

2.4 tCO2eq

#### PEOPLE

## VANN TOLA, THE FACE OF CHANGE

Portrait of Vann Fola. Producer & Vice-President of ICoProDAC

We are leaving Kampong Chhnang city behind and heading deep into the countryside. Surrounded by palm trees, thick vegetation and newly made groomed trails, we arrive in a vibrant site buzzing with street vendors, fried dough sellers and a few tourists. A famous producer in her country, Vann Tola symbolizes the economic and social success of improved cookstove (ICS) production in the province. A change has been triggered in Kampong Chhnang province... That's also what local development is all about.

#### THE COUNTERFEITER'S DAUGHTER

Everyone around knows Vann Tola. Barely 24 years old, this smiling little woman is head of the largest ICS production center in Cambodia. How did she do it? « *I simply seized the opportunity presented to me*».

Her story is uncommon and directly related to that of GERES' project. Iwan Baskoro, the former project director, remembers: «Vann Tola's story is not typical. Her father was a pot and traditional stove producer in the region. When we discovered he was making copies of the New Lao Stove (NLS), we decided to train him. Tola, his 16-year old daughter, decided to join the training.» Despite her young age, Tola proved to be a quick and resourceful student. She opened her own center after the training, which has since been growing, « I started producing NLS stoves in 2006. Then in 2008, I received financial support from ICoProDAC's economic pillar which encouraged me to expand. Right away I decided to invest in this bigger production center, to double my capacity and staff. Today, we produce about 6,000 improved cookstoves a month and work with 16 different distributors throughout the region, all the way to Phnom Penh.»

#### SOCIAL SUCCESS

Among Tola's 37 employees are 28 women. "Because in Cambodia, women handle the manual and meticulous tasks – whereas men represent physical strength and are assigned the heavy work. Still, women are incredibly efficient!" she explains, with a shy (mischievous?) smile.

While the average salary in Cambodia is \$150 per month, Vann Tola makes more than \$800. And she's not stingy with her employees: «I pay them \$8 a day, which is way above the average daily wage. They work skillfully and are well-qualified...

#### OUTCOMES

71% of ICoProDAC stove producers are women.



After all, it has to be a win-win situation for everyone.» Undoubtedly, Tola is among those who are ahead of their time! In 2010, at only 20 years of age, she was elected president of ICoProDAC (the Improved Cookstove Producers and Distributor Association of Cambodia, launched by GERES).

#### **MISS VICE-PRESIDENT**

After 4 years as president, she took a step back and now holds the position of vice-president. But she is still just as involved. «I'm in charge of supervising the processes, making sure the manufacturing requirements are maintained. I also participate in various meetings during which we make decisions for the ICS sector.» She makes it all sound so easy, yet behind her apparent humility is a fierce businesswoman. «Thanks to GERES, I quickly found my place as the head of ICOPRoDAC... I know the trade well. It's all been pretty simple and I never felt a hint of sexism against me.»

With these words and one last smile, she concludes the interview. We look around: people are busily walking up and down the production center. The employees of the assembly line look at us amused... Two distributors are loading up their cart while two more are in line. On our way out, Vann Tola suggests we get a souvenir – a gift shop that she opened for visitors curious about Kampong Chhnang pottery, this Cambodian «know-how». Truly, the winds of change are blowing over the plains of Kampong Chhnang.

#### PEOPLE

## **A SWEET BUSINESS**

Interview of Sourn Narein. Chairman of Sovannak Palm Sugar Enterprise & Guillaume Favre. business specialist at GERES



Sourn Narein with Guillaume Favre, his entrepreneurship instructor

Narein, 31, started working with GERES as a salesman for the improved palm sugar brand, Sovannak Palm Sugar (see page 33). After following an intense business training with Guillaume, he is now proud to be taking over the business. For GERES, this reflects how NGOs have a role to play in stimulating the private sector. Carbon funds allowed this smooth transfer, thanks to the 6 month incubation.

## Narein, how does one become a young chairman so quickly?

Narein (amused): For me, everything was clear; I always wanted to be head of a company. But I didn't know anything about being a business owner and had no money. GERES saw my motivation and decided to hand over the brand of Palm Sugar they had created to sell sustainable granulated palm sugar. They trained me, helped me build my business model and find investors.

## It must have been challenging to start training such a novice ?

Guillaume: I wrote a plan to follow and to push him to learn all the finance basics.

#### NAREIN S TIMELINE

2009 : Enters GERES as staff member

2010 : Becomes responsible for developing sales of Sovannak Palm Sugar for GERES

2013 : Agrees with GERES to take over the activity and begins the Incubation period

2013 : Becomes chairman of Sovannak

2014 : Sovannak is registered as an independent company

In the end, it was about providing moral support as much as training. I decided to start from the 'end' and make my way back to the 'beginning', with concrete topics to help him see how theory applies to real life. I prepared exercises and concrete situations to make him act like a real entrepreneur, because he is truly meant to be an entrepreneur and needed more "practice" than "theory".

## What specific challenges did you encounter?

Narein: There were many... The first one was to learn everything about managing a company. And at the same time, I had to find money to start the business. GERES and some personal contacts took some shares to help me.

#### Are you still working for GERES?

Narein (proudly): Not anymore! Sovannak is now registered as an independent company.

Guillaume:. Narein and I make the financial decisions and meet the new clients together. However, he takes care of all operational matters. I am just a backup.

#### You are now running the business on your own. Does it match your previous expectations?

Narein : Totally! But I knew the job before becoming the boss. I like working with communities. I hire workers when I am in a rush and my family helps a lot too. I go to the countryside 2 or 3 times a week to meet the producers. I don't want to do cheap business; I am convinced that people who work with me must have advantages, otherwise there is no point in launching a social business. I have to spread trust to get it back.

#### Who are your customers?

Narein: Today we sell only in Cambodia. Our product has a high quality image and our customers are faithful. We are not the cheapest but we are the only one with a real social and environmental impact. Our next step is to develop our product offer and try exporting. All of this is in the pipeline!

## What is your income? Are you able to pay yourself?

Narein: I have  $a \notin 500$  monthly salary. I can't complain, but I try to save money to invest in the company. I bought a van to transport the products and make the deliveries, and I rent an office and storage space. And this year, we plan to buy 22 tons of sugar, which is more than double the usual quantity.

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This publication is printed with funding assistance from the Blue moon fund.

