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Green Earth Concepts: Starting Up a Social Enterprise in Cambodia

Joel Eng Shen Ong
Singapore Management University

Student Case Study Collection

GREEN EARTH CONCEPTS
STARTING UP A SOCIAL ENTERPRISE IN CAMBODIA

In December 2010, Mr Yvan Perrin, co-founder of non-profit organisation (NPO) Green Earth Concepts (GEC) in rural Cambodia was troubled and discouraged. His proposal to the Cambodian government for project funding was rejected. He had presented a plan to develop local and profitable social enterprises which would use GEC's water filtration technology. He also sought collaborations with large non-government organisations (NGOs) in the region, but many of them were not keen on supporting his projects. Furthermore, his pilot project, the steam irrigation pump, was unable to take off because the inventor Mr Walt Barrett was unwilling to cooperate with him. Facing numerous challenges on different levels, Yvan was very frustrated. He reconsidered some of his initial ideas.

Agriculture and the Cambodian Eco-system

Poverty rates in Cambodia hovered at around 30.1%, according to 2007 data from World Bank. 77% of Cambodian people lived in rural areas, out of which 34.5% lived under the poverty line. [1] The reasons for rural poverty are numerous – illiteracy, seasonal food shortages caused by floods and droughts, landlessness and damage caused by decades of war and internal strife, were just a few of the problems that plague rural Cambodians.

More than 80% of Cambodians are active in agriculture, in particular, rice farming. However, environmental issues such as droughts and floods are perennial problems that Cambodian farmers face, which leads to low crop yields and is especially devastating to those already living in poverty. Seasonal floods were common, and could potentially wipe out entire crop harvests. Furthermore, over 73% of farmers did not use any form of irrigation[2], and grew their crops in dependence with climate and seasons. Irrigation therefore was critical for rural farmers. With irrigation, a hectare of farm land yielded on average 3 tons, and could produce two harvests a year. Without irrigation, a hectare of farm land yielded only about 0.9 to 2 tons, and only one harvest a year.

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All statistics, data and information, unless otherwise stated, is sourced from Mr Yvan Perrin and Green Earth Concepts.
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Most farmers then irrigated their crops either by purchasing fossil-fuel operated pumps, or by human power. However, those two options posed several problems. Human power is clearly inefficient and farmers often do not have the time and manpower to do so. On the other hand, fossil-fuel operated pumps were expensive to purchase, and fossil fuel prices were very volatile. When fuel prices increased, it reduced the profit margins of farmers.

A second issue was that of clean water. Many rural villages have little or no access to safe drinking water. Only 4.4% of rural areas had access to piped water, and merely 56% of the rural population had some sort of access to a water source. Thus, many people depend on alternative sources such as groundwater and rainwater, which is prone to contamination due to poor sanitation practices [3]. Furthermore, much of the rural population was ill-informed about water-related diseases, and regularly drank from contaminated sources. [4] Tuberculosis, dengue fever and other water contamination diseases were rampant in the countryside. Kantha Bopha hospitals in Phnom Penh and Siem Reap, admit about 300 seriously ill children each day, 40% of whom suffer from tuberculosis. Local awareness on water contamination diseases was considered to be non-existent.

NGO Landscape in Cambodia

The non-profit landscape in Cambodia was a puzzling one. Over 200 international NPOs resided in Cambodia, mostly in the city areas like Phnom Penh and Siem Reap[5]. These organisations worked closely with the Khmer government on issues such as development, clean water and education. Cambodia leans on foreign aid for nearly 80% of its GDP. However, in the rural regions this picture becomes cloudier. Although there are over 400 local NPOs and 600 associations registered with the Khmer government, NPO presence in rural regions was still severely insufficient. Yvan also believes that government development projects are "urban biased," and rural development projects by large international organisations (IOs)s and NPOs are often ineffective, as they do not understand local needs. According to Yvan's observation, corruption was prolific in the Khmer government, and had somewhat tainted the non-profit sector as well. Yvan felt that there was an urgent need for the creation and empowerment of local social enterprises and NPOs in rural Cambodia, and is an advocate of a "bottom-up" approach to rural development.

The task of creating and sustaining a non-profit organisation in Cambodia was definitely not an easy one.

The Founder

Yvan has been involved in developmental projects in Vietnam since 1989, and has extensive experience in green technologies. He is a partner of Green Concepts Manufacturing & Construction, which manufactures environmentally friendly construction materials called "Insulpanel." He also owns Mekong Green Power and the Water-Agriculture-Energy Institute[6],

which are both dedicated to providing sustainable solutions in safe water, biomass energy and local food production. Yvan has lived in Indochina for 22 years now with his family. He also spends a considerable amount of time at the project sites, in the rural areas around the Mekong River, Cambodia.

Yvan harbours long-term plans for GEC and has a strong belief in a bottom-up approach to rural poverty. Having worked in prior developmental and environmental projects, Yvan possesses valuable technical knowledge on irrigation pumps and water filtration technologies. Because he lives among the Khmer people, he also has a good understanding of Cambodian business practices and culture practices.

Founding of Green Earth Concepts

In 2009, Yvan was on a private project to secure paddy rice straw waste material from Cambodian farmers. On behalf of his company Mekong Green Power, he was looking for famers to consider joining his company in an organisation where they would provide him with paddy rice straw waste. Paddy straw waste would then be made into construction material or what is termed as "insulpanel." However, he was largely unable to do so as farmers were already organised in co-operatives, under private authorities. Some farmers' organisations were under private rice mill management that was not keen to share their organisational structure to develop GEC projects. One of the cooperatives that Yvan approached was run by a Khmer and which was leaning on micro finance loan sharks to get paddy rice supply to their mill. This, he believed was a very unconstructive way of cooperating with farmers. Cooperating with the farmers was proving to be an uphill battle.

When Yvan went to the rural countryside, he was appalled at the state of their agriculture industry, and shocked at the numerous challenges that rural farmers face. On a yearly basis, Cambodian farmers are faced with potentially devastating floods and droughts. He was shocked to learn that only a small percentage of farmers have access to irrigation, while the rest simply cultivate their crops in anticipation of the seasons and climate.

Seeing the struggles of rural farmers, and being unable to secure sufficient straw waste material, Yvan founded Green Earth Concepts (GEC) in early 2009. Their initial focus was on providing irrigation to farmers at a lower cost, and introducing bio-fertilizers to increase crop yields. The strategy was thus to support farmers to produce more, so that GEC could collect and obtain more straw waste supply material.

In summary, GEC seeks to alleviate the perennial problems of farming in Cambodia by providing affordable and sustainable water access to farmers. Their pilot project, the Barrett Steam Pump System, sought to enable farmers to control irrigation and water supply at a low cost via the solar generation of hot water. This is done in a cooperative setting that will encourage farmers to pay for services and products by supplying harvested crops instead of financial payment.

Secondly, Green Earth Concepts also seeks to implement technology to provide potable mineral water to villages at more affordable prices. Currently, GEC mineral water is sold at retail stores, and is priced below the average market price.

Organisation Structure

Currently, the GEC team is made out of 3 individuals. Namely, Chau Sok, who oversees construction and testing of irrigation pumps; Sin-Phong Chu, who is in charge of overall management and administration; and Yvan, who is the team leader and oversees operations and sets the direction for GEC.

Yvan describes GEC as a "community-based organisation" that works on the principles of a social enterprise. It seeks to empower local communities to adopt and take responsibility for GEC developmental projects, and encourages the growth of local social enterprises which would use GEC technology and infrastructure. For example, GEC not only conducted training for locals to operate the biomass irrigation pumps, but also encouraged these trained individuals to become "agents" that would offer irrigation pumping services and sales. Through this framework, GEC hopes to generate community-based development and thus, sustained development.

Location

GEC projects were situated in rural villages along the Mekong River and in Kompong Speu and Kirrium provincial areas. These locations were chosen mainly because they lacked access to water sources, and had no irrigation infrastructure whatsoever. GEC also focused on farming areas with at least 75% paddy rice farmers. Rural income depends almost entirely on crop yields, with no insurance or government welfare assistance. Thus, these areas are extremely vulnerable to floods, which would push them into severe poverty.

Yvan lives in Indochina and while in Cambodia, spends most of his time in the Mekong River region. He firmly believes that NPOs and social enterprises should be centered in the rural areas, and not in the cities. The bottom-up approach, spearheaded by the locals themselves, is one that is needed for rural development. NPOs need to be on the ground and actively looking out for the actual needs of the people, instead of trying to enforce their own projects and policies.

Current Projects

GEC is currently implementing two main projects:

1) Building village community irrigation pumps that run on renewable fuels
2) Providing clean water through water filtration equipment at a more affordable price than market rate

Village Community Irrigation Pumps- Irrigation is a huge cost for farmers. GEC estimates that when using a normal irrigation gasoline pump, irrigating one hectare of paddy rice field costs US$80 to US$110. This puts pressure on already low rural incomes, which are highly dependent on crop yields. Furthermore, if the previous season's yields were no good, farmers could in no way afford irrigation for the present year, thus reducing their crop yields further.

GEC's pilot project, the Barrett Steam Pump, ran aground because of commitment issues from the inventor Mr Walt Barrett. Thus, GEC decided to switch from a steam pump model to one that uses direct gas fuel. Their current pumps operate on 70% gas and 30% gasoline. Since gas is much cheaper than gasoline, GEC's irrigation pumps provide considerable cost-savings to farmers. Under this system, farming costs will be reduced by 10% and up to 60% of water used for farming will be saved, as compared to current usage.

GEC is also looking into an alternative model, a biomass irrigation pump. Testing is currently being carried out on this model, but conservative estimates put the total irrigation costs savings at 45%. GEC is currently sourcing for funds for their biomass irrigation pump.

Clean Water- While the model for irrigation pumps has yet to be finalised, Yvan is very proud of GEC's high-tech system of water filtration, which provides drinkable water for rural villages. Their clean water costs considerably less than the price of bottled water, and this will help villagers with significant cost savings.

GEC finds that purchasing normal bottled water takes up a significant portion of farmers' income. Having access to clean water is one of the top priorities for rural farmers. GEC thus seeks to provide mineral water to rural villages at a cheaper price than what normal bottled water costs. According to GEC data, 20-liters of bottled water costs US$1.25. In comparison, producing 20 liters of GEC mineral water only costs US$0.18. GEC has plans to retail its mineral water at US$0.50 to US$0.75, significantly lower than the market rate of US$1.25.

To construct GEC water treatment equipment, system investment cost is estimated at under US$20,000, and can supply water for villages as large as 4,000 households. With such a huge profit margin, Yvan believes that there is immense potential to further develop this project, and wants to encourage the creation of local social enterprises which would use GEC water technology and operate in this industry.

Challenges that GEC face

GEC has encountered numerous obstacles in implementing its projects. It faces challenges on different levels – from local communities, domestic government, NGOs, funders and a broader geo-political climate.

Community response is one. The renewable energy pump and clean water system offers significant benefits and cost-savings to farmers. Prior to project implementation, GEC meets villagers to inform them about the proposed project, cost of operation and how to

operate the equipment. Based on their ground surveys, GEC finds that farmers are largely amenable to the projects.

However, there has been some resistance to GEC's project plans. Farmers were initially skeptical about the quality of GEC water. Yvan met one particular lady who, although was in need of water, refused to try GEC mineral water. It was only later that they found out that she was afraid that GEC would force her to buy the water, thus explaining her initial refusal.
Also, cultural issues can be a stumbling block for GEC projects. Alcoholism is a serious problem in Cambodia, especially among men. A large portion of household income goes to feeding this habit, which puts unnecessary financial strains on households already living under or close to the poverty line. Yvan has had personal encounters with this issue. Two GEC employees were forced to leave because they were often drunk and refused to co-operate with him.

Additionally, Cambodian men are generally less receptive to the GEC proposed projects. They often have a false sense of bravado and refuse to listen to Yvan's proposals, believing that the traditional way is still best. Under the influence of alcohol, these men can even become violent and dangerous. He finds that women are generally more responsible and receptive to the projects, and they care more about finding a way out of poverty. Thus, he believes that the empowerment of women is a key step in community development, and is currently training women to operate the mineral water treatment system.

However, Yvan feels that farmers are largely receptive of his ideas, and willing to adopt GEC irrigation and water pumps into their communities. This can probably be attributed to his strong ties with the Khmer people, as he has been in close contact with local communities since 2009. Looking forward, it is crucial to maintain a strong and positive community response, to ensure sustainability and success of GEC projects.

Government and NGO response is another. Yvan is largely critical and cynical of the Cambodian government, and believes that the Khmer government is plagued by deep-rooted issues such as corruption, internal conflict and inefficient bureaucracy. Attempts to contact high ranking government officials have proved to be expensive and non-constructive. GEC presented its proposal to develop social enterprises in the rural regions, requesting for investment funds to start up these local enterprises. GEC's goal was to obtain government support, and in return, would promise votes from rural villages that stand to gain from these projects. However, the government turned down the proposal and further proposed collaborations with government officials were mostly disappointing in nature.

Yvan recounted a similar story where a certain government department was tasked to develop safe water systems in rural villages. The allocated budget was US$17,000 per village, yet only US$7,000 to $9,000 was disbursed, and the rest of the allocated funds clearly went to the pockets of government officials. Clearly frustrated with the state of

the government, Yvan has decided to operate GEC independently, away from the Khmer government.

He also shares similar concerns regarding large NPOs in Cambodia. These NPOs are mostly centered in Phnom Penh and Siem Reap. Thus, these NPOs focus more on urban poverty, and less on rural poverty. Attempts to partner large NPOs and IOs in projects targeted at rural development have also been largely unsuccessful, due to disagreements on goals and project implementation. Yvan thus decided to operate independently away from these NPOs.

Co-operation with smaller scale NPOs have been much more successful. GEC is currently working out a partnership with Kantha Bopha hospitals to provide them with safe drinking water for their patients. Yvan is an advocate of a "bottom-up" approach to rural development. In particular, he believes that having numerous small groups in rural villages (NPOs, Community-Based-Organisations, Social Enterprises, etc.), is the key to rural development.

Funding and Financial Sustainability

Foreign aid contributes to a significant portion of Cambodia's GDP. In 2009, Cambodia received a total of US$989 million in grants or concessional loans, most of which came from major donors such as the Asian Developmental Bank (ADB), World Bank and the IMF. The recipients are mostly large NPOs and UN agencies, who are in close relations with the Khmer government. However, smaller NGOs and other social groups find it hard to receive any kind of funding, especially if they are not situated in the city. In a 2009 Corruptions Perception Index study by Transparency International, Cambodia was ranked 158th out of 180 countries.[7] Yvan has encountered corruption first-hand while dealing with the Khmer Government and even with larger NPOs, and thus chooses not to work with either of them.

Funding, or the lack of it, is therefore a serious issue for GEC. Currently GEC has no major donors, and runs on the principle of a social enterprise, seeking to combine social and business objectives. So far, GEC has not generated any revenue by itself, and its main source of revenue has been from winning a grant from the Lien i3 Challenge. (Appendix 2) GEC is currently sourcing for funds for the biomass irrigation pump, and until they receive the required funding for system investment cost, are unable to proceed with the irrigation project.

Geo-political factors

Yvan describes the overall geopolitical situation as very complex and difficult, and is a major obstacle to rural development. Frequent border clashes between Thailand and Cambodia exacerbate rural poverty, with the worst rates of poverty being found in regions close to the Thai border. Relations with US and China are also complicated, due to the constant influx of foreign

aid. The country is still ravaged by decades of war and internal strife, and landmines strewn all over the countryside has led to huge losses of life and limb. The Khmer government has also yet to fully utilize Cambodia's natural resources for agriculture, and in recent years has paid more attention to urban development. Only 30 percent of all area suitable for irrigation has been developed into agriculture land, and clearly there is a huge potential for Cambodia to develop its agricultural sector.[8]

Next Steps

After some deliberation, Yvan was ready to propose some next steps with his Cambodian partner.

Exhibit 1
GEC
Financial Data to August 2010

Financial Report									
Date:	30-Apr-10								12-Aug-10
Items	**December**	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**
Pump construction and testing						270	526	472.25	584.4
Barrett Pump construction, tech support				2025					
Domestic travel, Lodging & Invitation	300				50	255.76	242.2	511.46	178
Gasoline & Car maintenance	240	335	305	305	831	349	377.38	421.5	90
International Travels	752								
Office rental contribution	170	170	170	170	170	125	125	125	125
Office Equipment & Expenses	29	39		360	2027	73.57	40.5	220.25	
Communication	225	225	225	225	225	265	285	225	
GEC members				3000	900	1000	1000	1000	500
Consultancy						160	240	70	
Water Treatment Equipment and Test								3238.6	
Total Expenses	**1,716.00**	**769.00**	**700.00**	**6,085.00**	**4,203.00**	**2,498.33**	**2,836.08**	**6,284.06**	**1,477.40**
					13,473.00				13,095.87
Net Grant (first tranche)					25,487.35				
Refund from Barrett (26 $ bank fee)						1,999.00			
Balance					**12,014.35**				917.48

Exhibit 2
GEC
Costs/Revenue Sources for Green Earth Concepts

1) Mineral water filtration system

Costs:

a) Energy to pump water out of the well

b) Energy to deliver water at a minimum of 4 bars and recirculating to water sterilizing equipment

c) Packaging material

d) Labor to operate system

e) Cleaning material (tanks and pipes)

f) Motor oil (every 100 hours engine) and occasionally pipe connectors and engine parts.

System Investment Cost: <US$20000

2) Biomass Irrigation Pump

Costs:

a) Biomass collection
b) Gasoline fuel
c) Biomass Irrigation Pump Testing

System Investment Cost: US$230,000 (Total)*

Revenue:

Grant from i3 Lien Challenge Competition – US$25,000 a year (3 years)

*Note: Investment cost has to include two steps a) biomass collection and process and b) system as gasifier, filter, piping, fan, battery car (to operate fan for 5 to 10 min on start) and gasoline fuel (to start engine). System cost including a 16hp gasoline engine and a 3,300L/min water pump cost under $600 all together. If we remove the pump and attach a alternator to produce electricity, the cost is $900 for a 10kWe system.

Endnotes:

[1] World Bank Data 2007, http://data.worldbank.org/.

[2] "Commodity Intelligence Report," United States Department of Agriculture, 2010; retrieved from http://www.pecad.fas.usda.gov/highlights/2010/01/cambodia/.

[3] "Study on water sources in Cambodia," World Health Organization, Western Pacific Region; retrieved from http://www.wpro.who.int/NR/rdonlyres/1AB59A47-F2EC-47EC-9911-7EABC501DEEF/0/Cambodia.pdf.

[4] "Estimates for the use of improved drinking water sources," World Health Organization, 2010; Retrieved from http://www.childinfo.org/files/KHM_wat.pdf.

[5] "Cambodian Rehabilitation and Development Board – General NGO Information," CDRB, 2011; retrieved from http://www.cdc-crdb.gov.kh/cdc/ngo_statement/general_ngo_information.htm.

[6] Water-Agriculture-Energy Institute, http://www.waeinstitute.org/.

[7] "Corruptions Perception Index," Transparency International, 2009; retrieved from http://www.transparency.org/policy_research/surveys_indices/cpi/2009/cpi_2009_table.

[8] Bingxin Yu & Xinshen Diao**,** "Cambodia's Agricultural Strategy: Future Development Options for the Rice Sector," A Policy Discussion Paper**,** International Food Policy Research Institute Washington, D.C., Prepared for *Cambodia Food Security and Agricultural Policy Stocktaking Roundtable*, 4 November 2010 (CDRI in partnership with Council for Agricultural and Rural Development and International Food Policy Research Institute, 2011).