

Concept Note Title:
Empowering Women with Smart Irrigation, Information and Enterprise Support

Note: Given below is a slightly expanded version of the concept note that was submitted to Global Affairs Canada on July 10, 2019, which was restricted to no more than 5 pages. This version includes useful information that could not be included in the 5-page concept note.

[Global Affairs Canada 2019 Call for Concept Notes - Development Impact Window](#)

Organization legal name: Think Renewables Group, Inc.

Country of headquarters: Canada

Organization contact name (person responsible for the project) *: Paul Stevers

Contact position title: President & CO

Project Duration: 48 months

Sectors: Agriculture and education, especially for girls and women. Country: Ghana (100%)

Total Global Affairs Canada funding requested (CAD\$): \$1,900,000.

Estimated total organization contribution to cost-share (CAD\$): \$100,000.

List key non-signatory organizations and/or entities, particularly women's organizations working to advance the rights of women and girls and promote gender equality and civil society organizations, that will participate in the implementation of the project (including local partners), if known:

Songtaba (serving basic rights for women and girls); Grassroots Sisterhood Foundation; International Center for Tropical Agriculture (CIAT); International Food Policy Research Institute (IFPRI); International Water Management Institute; University for Development Studies (UDS) in Ghana; NewEnergy; University of Ghana Business School (USBS); University of Ghana's Centre for Climate Change and Sustainability Studies; Pan African Centre for Climate (PACC) Policy; Entire Village Community Organization (EVCO); and Wuni Zaligu Development Association (WUZDA).

1.1 PROJECT SUMMARY

Studies have shown that small-scale projects focused on income-generating goods can have positive outcomes for a community (World Economic Forum Agenda 2019), through the reduction of political and economic inequality. Specifically, small-scale projects improve overall livelihood, including income, asset accumulation, health and nutrition. The objective of our project is to provide solar-powered Social Business (SBiz) centers, which combine low cost solar irrigation technologies, free educational resources and entrepreneurship support to female and male farmers in six communities in Northern Ghana. Our project will rely on three pillars: (1) the solar panels will help introduce a cost-effective energy-collection source for the community; (2) the irrigation system will provide the necessary water to grow agriculture crops while reducing drudgery for women who mostly fetch water for irrigation; and (3) a computer system that we developed called a Conferencing eStation (CeS), containing a large educational eLibrary, will support free education and entrepreneurship. The eLibrary

support will be tailored to meet identified educational needs / priorities of different social groups within the communities after the initial stakeholder engagement.

We would assemble a master educational eLibrary that would be installed in the CeS units for each planned community. The master eLibrary will include several available existing free eLibraries including the free RACHEL eLibrary assembled by World Possible, entrepreneurship information by the Climate Innovation Centre Ghana and the agricultural eLibrary assembled by the Entire Village Community Organization (EVCO). EVCO has invested considerable time and expense over the last several years to enhance its eLibrary to make it useful for farmers in Ghana. This eLibrary will complement information available through Ghana's E-Agriculture Programme. We plan to work with extension officers from the Ministry of Agriculture and Food to help farmers make effective use of these resources. Through these resources, we will also have a marketing information system, which will allow farmers to price their produce in according to regional standards. Global Affairs Canada (GAC) currently finances a substantial agricultural support program in Ghana called Modernizing Agriculture in Ghana (MAG). We plan to collaborate with the implementers of this program to further help farmers, especially women.

Also, we plan to engage women's organizations in northern Ghana, including Songtaba & Grassroots Sisterhood Foundation, to complete important tasks such as the following:

- a) Community-based assessments to empower beneficiary groups, especially women and girls
- b) Climate change adaptation training for women.
- c) Stakeholder meeting with relevant actors to assess community agricultural and educational needs of especially women and girls
- d) Integrated training on agronomic, climate, markets and nutrition throughout the cropping season for men and women farmers
- e) Women and youth leadership courses
- f) Provide participatory evaluation data on the effect or impact of solar irrigation system and education on the farm and household gender dynamics after the trainings and practices

Moreover, entrepreneurs in the communities, who have been identified by these women's groups, will be invited to apply to the entrepreneur incubation support programs at the Climate Innovation Centre Ghana and the University of Development Studies Business Incubation Centre.

Through this project, we plan to scale-up implementation of proven solar-powered irrigation systems and build on the experience already gained in Ghana with irrigation related initiatives implemented by NewEnergy in Ghana (for more details, see "PROJECT EXAMPLE" section below). The new irrigation systems will be designed to meet requirement of its users. The irrigation technologies installed in each selected community will depend on water availability and land configuration. For example, if water supply is limited, a drip irrigation system will be used. If there is plenty of water available and the land area is relatively flat, then a centre-pole spray irrigation system would likely be installed. Spillover and downstream effects would be to increase availability of nutritious foods like fruits, vegetables and legumes, providing a niche market especially when combined with cold storage and/or processing activities.

Since access to water is a growing concern for many households in rural Ghana, women often continue to rely on labour-intensive manual irrigation methods, like hauling water with buckets; therefore, with the new irrigation systems we expect that women will have more time to invest in trading activities and have greater capacity to manage their business activities. The education support would increase women's ability to manage income from the sale of irrigated crops, buy assets and meaningfully participate in production, spending, and other household decisions and potentially increase their role in

community leadership. Likewise, the educational materials will allow women to gain entrepreneurship skills to access credit or support to be able to expand their business beyond petty trading. There will also be an educational component that will enable illiterate women, men and youth to learn basic literacy/numeracy training, through video lessons, practice exercises and games.

There are many communities in northern Ghana that would benefit significantly from our project. If this project is funded by Global Affairs Canada, we plan to implement an evaluation process to narrow down our selection to 6 communities out of the ones that have been recommended to us by organizations we know that are located in Northern Ghana. For example, one of the women's organizations we are working with recommended we consider including the following communities in our project:

- a) Tamalgu - Karaga district
- b) Yapei - Central gonja
- c) Dipali/Adayili- Savelugu district
- d) Kukpehi- Sagnarigu Municipal
- e) Malzeri- Yendi Municipal
- f) Bunglung- Savelugu district
- g) Golinga- Savelugu district

1.2 PROBLEM STATEMENT

In Ghana, approximately 70 percent of the population depends directly or indirectly on agriculture and 50 percent of the national labour force relies on agricultural production for their livelihood (World Bank 2017, p.7). Despite the richness in natural resources, the Northern part of the country faces a vast number of challenges in agricultural production, including only one rainfall season, limited access to agricultural inputs and technologies, lack of access to financial and information services, all of which contribute to problems of food and nutrition insecurity (Adu et al., 2018).

1. Low agricultural productivity and rising levels of food insecurity due to:

- a. Northern Ghana experiences a unimodal pattern of rainfall, with only 4 to 5 months of rainfall and a long dry period. Climate change only exacerbates the production challenges of the region by increasing uncertainty and risk. Seasonal food insecurity is widespread, mainly due to excessive dependence on rain-fed agriculture and lack of agricultural diversification.
- b. The government of Ghana through eminent domain, built dams and reservoirs where most landowners (mainly men) have been re-allocated lands in the irrigation schemes leaving most women landless. In 1977, Ghana Irrigation Development Authority (GIDA) provided water for free to farmers alongside highly subsidized inputs. However, with an increase in irrigation schemes in the North, the government could not keep up the subsidies. From 1986, management practices changed, men and women were expected equally to take over management and operational roles in irrigation schemes. This did not happen, as can be seen in low women participation in irrigation sites, low representation in management positions and decision-making due to cultural barriers. The irrigation scheme by GIDA has not been very successful due to poor infrastructural support for the irrigation system.

2. High rate of illiteracy among women and girls in the Northern part of Ghana:

- a. The concept of literacy spans beyond the basic ability to read and write but also the skill to view, design, listen, speak, discern and interpret confidently and independently in effective communication. Many women and girls in Ghana lack basic education, which limits their ability to participate in important decisions in the household and communities, including those related to irrigation management.
- b. Girls are faced with the unequal burden of household chores and food provisioning, which may

prevent them from remaining in school. Due to a lack of education, women often do not take up leadership roles in the community or expand their business activities. In fact, most of women are engaged in the marketing and selling of the farm produce, and not in the decision-making and management of the farm itself. The few female agripreneurs, according to a recent study by FAO are less skilled in farm and financial management compared to the male agripreneurs. They are also mostly cash constrained and less knowledgeable on the use of farming inputs, technologies and fertiliser application for increased food production.

3. Lack of access to and control over productive resources, such as land, and limited input in agricultural decisions:

a. Although women are heavily engaged in agricultural activities in Northern Ghana, they have limited access to and control over productive resources, especially land and agricultural equipment. Unequal access to land and assets is due to the patrilineal inheritance patterns that automatically transfer land and other properties to male descendants instead of the females. It is estimated that if women had equal access to farmland like men, food production in Ghana could increase by approximately 4 percent and subsequently reduce hunger by 17 percent (Women and Smallholder Agriculture in Ghana Policy Brief, 2014).

b. Women's involvement in agriculture and in decision-making is growing. However, women still have more limited opportunities to lead decisions related to farm and financial management over the years. To facilitate agripreneurship among women, there is the need to develop agricultural projects, programs and policies that consider the needs, preferences, and priorities of women in the design, implementation, and monitoring and evaluation stages. Gender-sensitive interventions will facilitate women's empowerment and contribution to agricultural growth in Ghana.

Conclusion: The Irrigation Policy Goal of Ghana aims to achieve sustainable growth and enhanced performance of irrigation, contributing fully to the goals of the Ghanaian agriculture with the following specific targets: to ensure national food security; intensified and diversified production of agricultural commodities; increased livelihood options; optimum natural resource use; reduced negative environmental impacts and expanded investment space for irrigated production. The existing challenges in the agriculture sector have been greatly intensified in recent years by the emergence of a new paradigm suggested by the Sustainable Development Goals (SDGs) of which numbers 1, 2.3, 2.4, 4, 5, part of 6.4, and part of strategy 6.b , 7, 8, 12 and 13. Improving the food and nutrition security of the people of Ghana, especially women and children, is essential for achieving Sustainable Development Goal 2 (End hunger, achieve food security and improved nutrition and improve sustainable agriculture), and a critical element for the healthy human capital essential for Ghana's economic growth and development.

1.3 EXPECTED OUTCOME AND THEORY OF CHANGE

The project has clearly defined pathways on how immediate and intermediate outcomes are expected to lead the ultimate outcome. Ultimately the SBiz centres, in a gender equitable and environmentally sustainable manner, seeks to contribute to: (1) improved women economic empowerment in rural areas (2) Enhanced food security particularly for women and children (3) Improved educational delivery systems for all and (4) Increased job opportunities for women farmers in the rural regions of North Ghana. To achieve this goal, the project will build on existing irrigation projects, by strengthening the extension delivery systems to reach especially women farmers with technical knowledge on how to manage their crops and market it. This will spur production volume and quality, which in turn, will increase trade in niche markets and utilization of marketable products for food and nutrition security. Farmers, especially women will be able to generate more income as they diversify their crops to meet the changing diets of rural and urban population and reinvest in their future production systems and for other needs. Involving women and youths in the solar powered irrigation technology system will reduce

drudgery and labour while addressing other gender inequalities that result in accessing and controlling technology. Value addition in legumes and vegetables will be supported through incubation systems to promote agripreneurship.

At the intermediate level (1) we intend to improve women economic empowerment through designing and tailoring farm and management information through videos and community trainings, carried out close to households where women and youths can attend. This will increase women participation in trainings and subsequently increase their voice in irrigation management exercises and household bargaining power. Through the skills and knowledge they gain from these trainings, we expect to see increase access and use of improved irrigation technologies and education, freeing women's time burden in agriculture and greater investments in other income-generating activities like trading or other value chain activities like processing and marketing. We expect that women will likely spend their extra savings on education and health, improving the livelihood of their family. We likewise expect that women will act as a good example to others in the community and inspire the next generations to gradually reduce/break the male-dependent socio-cultural pattern. From a policy perspective this project will contribute to the Review of Ghana Irrigation Policy for inclusion and participation of women and girls in small-scale irrigation. Secondly (2), to enhance food security particularly for women and children, women and men would receive an integrated training (agronomic, gender, nutrition, marketing) on the need for crops diversification and subsequent improvements in dietary quality. To address the question of malnutrition in Northern Ghana, one high-calorie product diversification will include the production of high Iron beans as grain or green beans in addition to other vegetables and cereals they already grow. Once picked, these high Iron beans can be processed into different bean based products like composite flour, bean drinks with baobab, scones, precooked beans, which will generate income for women, address health and nutrition as well as post harvest losses. Thirdly (3), in Improving the educational delivery systems for all, mixed delivery system techniques will provide different information that target women and male farmers, youths interested in agriculture, children and adult education. All farmers who are part of the irrigation system will undergo a choice experiment on whether they want a saving option attached to their irrigation activities that will serve them and the community. Other options could be extra money from water contributions etc. If agreed the money generated from the irrigation system will encourage community members to explore profitable business opportunities such as: solar-powered convenience stores, solar-powered cold storage, and Biodigester to generate energy from waste. Children and the elderly will be exposed to free digital learning resources to boost their general and technical knowledge. Lastly (4), increasing job opportunities for women farmers in the rural regions of North Ghana will entail enhancing agricultural production through access to information, improved seeds, integrated trainings which if well harnessed can create opportunities along the value chain to attract other actors (such as processors, aggregators) to build their agribusinesses and encourage youth to remain in rural areas. With increased availability of crops, we expect improvements in food security in the Northern region and other parts of Ghana contributing to the larger economy of Ghana through rural-urban linkages.

We will address the environmental risk related to the selection of the six communities by considering the potential for irrigation. We will retain IWMI to use their developed methodology for identifying irrigation potential based on a set of sustainability criteria including topography, distance to surface water sources, groundwater availability, and market access. Only areas identified with a high potential for irrigation will be selected for the project to minimize problems related to water depletion. As well, we will work closely with IWMI to perform community-specific solar irrigation sustainability mapping.

CURRENT OR PAST PROJECT EXAMPLE

Project title: Combining Solar-Powered Irrigation Schemes with free digital educational resources and entrepreneurship support

Name of recipient organization: Water User Association based in the communities of Tamalgu, Nakpanduri, Datoyili and Fooshegu in Northern Ghana

Approximate project value (CAD\$): \$350,000. (Phase 1: \$327,000 + Phase 2: \$23,000)

Approximate amount managed by your organization (CAD\$): 23,000.

Country/ies (and location/s within that country): Tamalgu, Nakpanduri, Datoyili and Fooshegu in

Name of project contact and telephone number: Mr. Amadu Mahama, Chairman, NewEnergy, Tamale, Ghana, +233 20 079 9601

Project start date (YYYY-MM-DD): 2014-10-01

Project end date (YYYY-MM-DD): 2019-09-30

Canadian and/or non-Canadian partner organizations (if any): a) NewEnergy, Tamale, Ghana b) Entire Village Community Organization (EVCO), Accra Ghana

Description of the project:

In 2015, four solar-powered irrigation schemes were contracted in the communities of Tamalgu, Nakpanduri, Datoyili and Fooshegu in Northern Ghana. This project is now in the process of being expanded to include large free digital educational eLibrary and entrepreneurship support for these communities.

The large free digital educational eLibrary have been assembled by World Possible from California, USA and the [Entire Village Community Organization \(EVCO\)](#) which has offices in Ghana. EVCO has invested considerable time and expense to include considerable information for farmers in this eLibrary. This eLibrary will complement information available through Ghana's E-Agriculture Programme. We plan to work with extension officers from the Ministry of Agriculture and Food to help farmers make effective use of these resources. In addition, entrepreneurship information for sustainable businesses from the [Climate Innovation Centre Ghana](#) and the [University of Ghana's Centre for Climate Change and Sustainability Studies](#) will be included in the eLibrary.

To support entrepreneurs in communities involved in this project will be invited to apply to entrepreneur incubation support programs at the [Climate Innovation Centre Ghana](#) and the [University of Development Studies Business Incubation Centre](#).

The free education eLibrary will be included in the [Conferencing eStation](#) developed by Think Renewables Group. This system enables simultaneous access to internet communications and the education eLibrary level. To increase reliability of communications, it combines multiple sources of Internet into one and provides priority bandwidth to computer designated for video conferencing.

Given below are some more details about the irrigation systems that have been installed as part of this project:

- Solar-powered irrigation pumps were installed in four communities with a capacity to water up to 15 hectares of land.
- Drip irrigation demonstration kits were also installed.
- 78 farmers have benefitted from the project, which reduces energy costs and allows for multiple harvests each year.

Funding agency (the organization that provided funding for the project): Phase 1: United Nations Development Programme in partnership with Ghana Energy Commission. Phase 2: [Think Renewables Group](#), [NewEnergy](#) and [Entire Village Community Organization \(EVCO\)](#).

News articles about this project:

- a) UNDP: [Tapping the sun to increase rural incomes in Ghana](#)
- b) UNDP: [Solar-Powered Irrigation: A Boost for Farming Productivity](#), November 19, 2018