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The "Social enterprise model of Eco-Village Development Concept" was made in the framework of an NGO cooperation Project titled "Strengthening the Eco-Village Development concept: Affordable local climate actions for sustainable development in South Asia" in September 2019 to July 2020.

### The Study Is Based On The Following Three Publications

"Feasibility Study of Eco-Village Development Concept in the Coastal Area of Bangladesh" published by Grameen Shakti, 46 pp., 2020.

The Eco-Village Development Concept described in the publication "Eco-Village Development as Climate Solution, Proposals from South Asia". 60 pp. 2017. INFORSE ISBN 978-87-970130-1-4.

"Socio-Technical Manual for Training of Trainers (ToT) Manual on Participatory Planning, Technology and Knowledge Transfer of Eco-Village Development (EVD) in India, Nepal, Sri Lanka and Bangladesh." 132 pp. 2018, INFORSE ISBN: 978-87-970130-3-8. The last two publications are available in English, Bangla, Hindi, Nepalese, and Sinhala.

### Download publications from

http://www.inforse.org/asia/Publications\_EcoVillageDevelopment\_South Asia.htm

### The Project Partners

International Network for Sustainable Energy (INFORSE), INFORSE-South Asia regional and national coordinators : Grameen Shakti (Bangladesh), INSEDA (India), CRT-N (Nepal), IDEA (Sri Lanka), and CANSA. Project Coordinated by INFORSE and DIB in Denmark.

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### EVD Project's Web Sites

www.ecovillagedevelopment.net and www.inforse.org/asia/EVD.htm Published by Grameen Shakti, Bangladesh.

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### 1. Background

While the world is still facing the adverse effects of climate change and global warming and the current world is continuously trying to mitigate the consequences through reducing carbon footprint, pollution and greenhouse emission through various means, The Eco-Village Development (EVD) concept aims to mitigate the negative impact of climate change through taking the bottom-up approach of introducing low-cost, affordable clean energy solution for the rural communities. EVD is an integrated socio-economic development concept, In which existing villages are taken as the smallest unit for integrated climate action through introducing renewable energy solutions. The EVD concept has been developed and promoted in the framework of a multi-country project, comprising partners from four south asian countries-bangladesh (Grameen Shakti), India (INDSEDA), Nepal (CRT Nepal) and Sri-lanka (IDEA) The Project Has Been Supported By CISU, Denmark Since 2015.

The EVD concept focuses on promoting local and affordable climate friendly technologies and practices, as Means to create sustainable local development and climate mitigation and adaptation actions in existing rural villages and communities. Bangladesh, India, Nepal & Sri-Lankathe aim of EVD is to contribute to tackle the magnitude/threat of climate change through a bottom-up approach, which can be done through the promotion and implementation of many micro-levels, people-centered actions at the grassroots level. EVD involves implementing sustainable inexpensive solutions. Moreover, the solutions have a multiplying effect serving several sustainable development goals (climate, clean energy, water, food, etc.) The concept of EVD can be scaled up via three ways-advocacy, incorporating with other programs and sustainable models.

This study on the social enterprise model was prepared, for the purpose of introducing a sustainable model for local villages. The ultimate goal is to achieve sustainability by enabling the model to support it self financially in innovative ways instead of relying solely on grants and donations. A social enterprise model has a sustainable financial model, where the model will sustain it self by getting the investment back.



(1)

## 2. Introduction of Social Enterprise Model

### 2.1 What Is Social Enterprise Model

Social Enterprise Model is a model with social objectives in parallel with making the product/solution sustainable through maximizing benefits (economic & alternative value) to society/community and the environment.

A social enterprise model is a platform for social entrepreneurs to have a sustainable business, which generates both social value and economic value. this business model includes two key elements. An operating strategy that includes internal organizational structure. And a viable financial that are crucial for creating the organization's intended impact and a resource strategy that will shape and define where and on what terms the organization will acquire the resources for maximum cost saving.

### 2.2 Objective of Social Enterprise Model

- Sustainable operational model for EVD solution
- Replication of viable business model in future

## 3. Methodology

To develop the Social Enterprise Model, following steps have been taken :

### 3.1 Case Study

Through desk research, different information and data have been collected to develop the model. A detailed case study of Solar Home System (SHS) in Bangladesh has been conducted to understand the key success factor of a sustainable and success model. Based on the learning of the SHS roll-out model, the model for one EVD solution (biogas plant) has been prepared.

### 3.2 Literature Review

The following literature review gives an insight of why and how this model can be a feasible choice :

• In contrast to the traditional business, a sustainable business model provides substantial positive and/or significantly reduced negative environmental and social impacts through changes in the way the firm and its value network create, deliver, and capture value, or in the way that they change the value propositions (Bocken et al. 2014). In their paper Johnson & S, 2009 and rohrbecket al. 2013 showed that companies in networks are more successful in producing sustainable value than stand-alone companies.

### 3.3 Gap Analysis

## **SWOT** analysis of EVD solutions



### 3.4 Key Performance Indicator (KPI)



### 1. Revenue

Revenue from the technology/solution must meet the operating and maintenance (O&M) cost of the technology.

### 2. Cost saving/Alternative income

If any technology/solution does not directly contribute to revenue generation (for example ICS), then the cost saving must cover the upfront cost within a considerable amount of time (payback 2-3 years).

### 4. Case Study of Solar Home System

The Solar Home System (SHS) program in Bangladesh is one of the most successful models in the world. Hence, most of the SHSs in the world are in Bangladesh and through understanding the model of the SHS program in Bangladesh and analyzing the key success factor can help to develop a similar sustainable and successful model for other EVD solutions, like biogas plants. Bangladesh and analyzing the key success factor can help to develop a similar sustainable and successful model for other EVD solutions, like biogas plants. Bangladesh and successful model for other EVD solutions, like biogas plants.

### 4.1 Solar Home System in Bangladesh

Even only 2 decades ago, more than 68% of people of bangladesh had no permanent access to electricity. the government of Bangladesh set a target of providing electricity to all its citizens by 2021, under the government's vision "Energy Security and Electricity for all by 2021".

As almost 70% of Bangladesh's population lives in the rural areas, the Government of Bangladesh considered off-grid renewable energy technology to be one of the best options for bringing electricity to rural areas, as expanding the electricity grid distribution line to rural regions and low-income households was not a cost-effective solution.

The Solar Home systems (SHS) initiative began 2003 with an aim to "fulfil basic electricity requirements of the off-grid rural people of Bangladesh". This program was facilitated by the Government-owned Infrastructure Development Company Limited (IDCOL).



### 4.2 Impact of SHS Model

As of 2020, Bangladesh has installed 5.8 million SHSs, making it the largest installer of SHS in the world and benefiting 25 million population. more than 13% of Bangladesh's population enjoy the benefits of electricity because of SHS.

Due to the SHS, more than 3 million students can study after darks. Thousands of shop and business enterprises can run their activities for extended hours.

Before SHS, kerosene lamps were commonly used for domestic lighting in rural Bangladesh. However, these are expensive, provide only poor illumination, and produce emissions that affect health, particularly of the respiratory organs. SHS also reduces the consumption of dirty fossil fuel and contributes to reduce GHG and global warming.



Before



After



5,800,000 Units Solar Home System



1,400,000 Liter kerosene consumption Avoided



 $\begin{array}{c} 397,417\\ \text{CO}^2\\ \text{emission reduced} \end{array}$ 

### 4.3 SHS Roll-out Model

The Government of Bangladesh founded Infrastructure Development Company Limited (IDCOL), which has been promoting and financing in the private sector since its inception in 1997, focusing on infrastructure, renewable energy and energy efficiency projects.

Since 2004, IDCOL has been implementing a large scale Solar Home System (SHS) Program with support from various local NGOs, MFIs and private entities. Consonant with the Bangladeshi Government's vision of providing "access to quality electricity to all people at an affordable price by the year 2021," the program's objective is to fulfill basic electricity needs in the rural areas of the country.

While demand for small-scale renewable energy is virtually infinite, a small microfinance institution or energy enterprise needs capital to meet that demand with supply. IDCOL addresses this barrier to scale in a unique and exciting way. With massive infusion of government capital, management from the private sector and a unique asset finance model using creative partnerships, IDCOL has produced a stunningly successful program.

IDCOL adopted the following operational model to execute a solar home system program.



## Components of the model

### Main Components

### **Developing Partners**

Developing partners such as the World Bank, the United Nations finance various infrastructure development activities. For the Solar Home System (SHS) program Bangladesh government receives grants from such donor agencies.

### IDCOL

Through the government of Bangladesh, the Infrastructure Development Organization Limited (IDCOL) finances renewable infrastructure projects in Bangladesh. For, SHS program it provides the finances in two ways:

- IDCOL offers a certain percentage as a grant to its enlisted Partner Organizations (PO) and NGO's.
- For the remaining portion IDCOL lends the money to the NGO/PO.

### NGO/PO

IDCOL has some preset criteria for the NGO/PO to be eligible for seeking grants and loans. The interested NGO/PO's seek approval from IDCOL's "PO Selection Committee" to operate the SHS program. Upon getting approvals they can apply for the fund. Then the NGO/PO's use the grant to sell the SHS and related services to the households. And for the supply of necessary equipment needed for the installation of SHS, NGO/PO's pay the suppliers with the loan they received from IDCOL.

After getting payment from the customers, they repay the loans to IDCOL.

### Suppliers

To maintain the integrity and quality of the equipment, IDCOL has some enlisted suppliers from whom the NGO/PO's buy their necessary equipment. These suppliers have to get approval from IDCOL's Technical Standards Committee.

### Households

Many households of rural poverty driven Bangladesh are deprived of electricity. The NGO/PO's sell the SHS to them. The households pay the down payment initially and the rest is paid through installments.

### **Supporting Components**

### **PO Selection Committee**

IDCOL has a committee to select the NGO/PO's for the Solar Home System (SHS) program. This committee receives the applications from the PO's select and gives them approval by checking their eligibility to carry on the SHS program.

### Technical Standard Committee (TSC)

The main task of the "Technical Standard Committee" is to maintain the standard and ensure the quality of the equipment used for the SHS program. Suppliers seek approval from the TSC to supply the equipment to the NGO/PO.

## Success

When the project was initiated in 2003, roughly 12,000 SHS had already been installed in Bangladesh and the target was to install 50,000 systems by 2008. This target was achieved three years ahead of schedule in 2005.

8% of electricity access in Bangladesh is provided by off-grid solar, making it one of the top 6 countries with electricity access from off-grid solar solutions Around

# 70%

Solar Home Systems installed worldwide, are in Bangladesh

## 4.4 Key success factors



### **End user Attractiveness**

Pay to own model

Better energy alternative



### Product

- Quality & Durability of product
- Local manufacturing capacity
- Warrant service & Service product



### Quality

- Technical committee for Product standardization & approval
- Quality consciousness by the POs
- Technical field audit



### Service

- Proximity to customer
- Distributed delivery, Installation & Serv.
- Monthly visit for Service and Collection



### Finance

Easy DP & Installment

- Availability of donor fund
- Capital buy down and Refinancing



### **HR Resource**

- Availability of adequate Human Resources
- Micro credit orientation

## 5. Community Biogas Plant:

Biogas plants collect bio waste – such as manure, sewage sludge, food and plant waste – and put it through a process called anaerobic digestion. This is a natural process during which micro-organisms break down organic matter in the absence of oxygen, resulting in:

- a) renewable energy (biogas) and
- b) high-quality biofertilizer (digestate).

The large quantities of cow drug & other organic wastes in rural areas can be used to produce significant amounts of biogas in an organized way. Such biogas plant in rural areas are called community biogas plants.

Rationale for selecting community-based biogas plant for developing Social Enterprise Model

- Biogas plant covers both the components of KPI (revenue generation & cost saving) as mentioned in the section in 3.3.
- South Asian countries have an agro based economy. Most of the population lives in the rural areas, hence biogas plants have greater prospects.

## 6. Social Enterprise Model of Biogas Plant



### **Components of the Model**

### 1. Expenses

- Upfront cost will be provided from financial institute/donor fund for capital buy down, if required
- There can be other financing sources also (CSR, crowdfunding etc)
- Project financer may coordinate with standardization committee to ensure proper quality and service

### 2. Project Implementer

- Village community will coordinate with Project Implementer for installation
- Implementor will seek for finance from different source
- Implementor will coordinate with industry to purchase required product/service
- Implementor will also influence the supporting organization to boost input in the community

### 3. Revenue

- Alternative Earing (from cost saving)
- Direct Earing (community biogas sale, manure sell)

## 4. Operation & Maintenance

- Local community will take care Operation & Maintenance (O&M)
- A cooperative fund can be created to cover O&M cost, when required
- monthly service charge will be taken from the beneficiaries

### 5. Standardization Committee

- Will ensure the quality of the product and service
- Technical assistance to the implementor
- Monitoring

## 6. Local Industry

- Will supply required product
- Industry can also provide product on credit, which is reduce the
- financing gap

## 7. Lessons Learnt from Biogas model



## Finance for Capital Buy Down

Since the upfront cost of an eco-friendly solution or technology is higher than the conventional solution or technology, finance (grant and loan) is crucial to creating a level playing field. Developing partner, National program, crowdfunding, CSR etc. can play a significant role for capital buy down.



### Market Linkage

To earn more revenue from biogas plants, maximum utilization resources needs to be ensured. To achieve the target, bio slurry can be processed to procure organic fertilizer or vermicompost and can be sold to the market. This organic fertilizer can be used for vegetable cultivation and the produced vegetables can be sold at market at higher price



### **Cooperative Fund**

To ensure proper operation and maintenance of the biogas plant, the cooperative fund needs to be maintained. A fixed portion from the revenue earned from the biogas can be kept in each month to maintain this fund.

### CAPEX/OPEX Optimization



Operating Expense (OPEX) of all the biogas plants needs to be covered up, otherwise the model will not sustain. Capital Expenditure cost needs to be optimized. Compared to Individual / family type biogas plant, the investment in community type biogas plant is comparatively less.

## 8. Opportunities

### Government's Village Development Agenda

Bangladesh consists of 68,000 villages and more than 70% of the total population lives in the rural areas. In the most recent Five-Year Plan, the government of Bangladesh has focused on "Strategy for Local Government and Rural Development". To reduce poverty and improve the socio- economic conditions of the poor people living in rural areas the government has formed a Rural Development & Cooperative division and a Comprehensive Village Development Programme (CVDP), which are implemented to promote overall development of all segments of population of a village under a single co-operative organization.

Bangladesh Rural Development Board (BRDB) is engaged in rural development and poverty alleviation programmes. The Rural Development Academy (RDA), a specialized rural development institution for training, research and action research has been implementing some projects to integrate water management projects, poverty alleviation through livestock management and biogas bottling projects and command area development using surface water for rural livelihood improvement.

### Nationally Determined Contributions (NDC)

Bangladesh has adopted a two-fold strategy against climate change in the NDC. The main focus of Bangladesh's activities is on increasing the resilience to the impacts of climate change. With the development and implementation of a Social Enterprise Model (SEM) we can contribute to the Government's target of rural development, low carbon development, and increasing resilience for the climate vulnerable areas.

### Soft Financing for Sustainable/Bankable Project

Financial institutes can play an intermediary role between economic development and environmental protection, for promoting environmentally sustainable and socially responsible investment. 'Green banking' refers to the banking business conducted in such areas and in such a manner that helps the overall reduction of external carbon emission and internal carbon footprint. Considering the importance of green banking, Bangladesh Bank (BB), the central bank of the country, has undertaken a number of initiatives. The Social Enterprise Model ensures the viability of green solutions and hence accessing soft financing can be easier.

### Climate Fund

Bangladesh, as a climate vulnerable country attracts a significant amount of fund flow for climate mitigation and adaptations. Various international climate funds such as Climate Investment Funds (CIFs), Green Climate Fund (GCF), Adaptation Fund (AF), and Global Environment Facility (GEF), UNEP's Environment fund etc can be a good opportunity for Bangladesh in dealing with climate change, greenhouse-gas-emissions mitigation, adaptation, and finance. In the Paris Agreement, the developed countries also committed to contribute in climate vulnerable regions, which can be a great opportunity for Bangladesh.

### 9. Way forward

For further replication and upscaling of the EVD concept with a target of greater impact, the Social Enterprise Model (SEM) can play a vital role. SEM also has the potential to sensitize policy makers, can attract more funds and impact investment.

The Social Enterprise Model (SEM) of the community-based biogas plant has been developed based on desk research, successful model analysis, data analysis and feedback from experts. Lessons learnt have been taken into account. However, for further evaluation of the proposed model, field testing is required. Based on the field trial the financial and operational model of the community-based biogas plant can be further developed. Since major parts of South Asia are still agro based, implementation of community-based biogas plants can be promising. Furthermore, in order to understand the effect of the proposed model for this particular sector, the project can be piloted in some parts of the selected area of the project, such that those areas serve as 'control' areas, by which it will give a clear picture of how the model succeeds/performs in case of biogas, keeping all the factors same or similar to a greater extent.

Moreover, this initiative contributes to a number of Sustainable Development Goals (SDGs). Biogas, as a renewable energy, will certainly contribute to SDG-7: Affordable and Clean Energy. It also intricately resonates with SDG-12: Responsible Consumption and Production. from using the SEM model to advocating use renewable energy of biogas - everything revolves around responsible consumption and production, producing lesser pollution as a result and thus, moving one step forward towards SDG-13: Climate Action, as this is the high time to reverse the bad effects of the damages we did to our climate, to our Mother Earth.