

# Summary of Feasibility Study

## ECO-VILLAGE DEVELOPMENT (EVD) CONCEPT

CONDUCTED BY INSEDA, INDIA<sup>1</sup>

### IN MARGUL PANCHAYAT, BAJNA BLOCK, RATLAM DISTRICT, INDIA



In India, around 70% out of 1.38 billion population lives in the villages. Although the government has made several efforts to enhance access to clean cooking energy through various programs, recent studies in poor states in India show that only one third of the population uses LPG as primary source of cooking, primarily due to poverty. Most vulnerable among rural poor are tribal areas where not only energy access is a major problem, but the other services such as education, health and economic developmental opportunities are severely lacking.

The **Eco-Village Development (EVD)** concept being promoted and implemented by INSEDA along with other four NGO partners from South Asia, namely, CANSA (India), IDEA (Sri Lanka), Grameen Shakti (Bangladesh), CRT/N (Nepal) with specialist support by INFORSE, Denmark and overall coordination and management by DIB, Denmark; as well as with the financial support from the Civil Society Fund (CISU), Denmark, for the sustainable development of villages in South Asia. The **Eco-Village Development (EVD)** approach, considers village as the smallest unit for practical action, using climate-friendly, green technology as the viable and replicable solution with active community participation. Thus, EVD can be implemented by a NGOs and other grassroots development organisations, in their areas of operations, with appropriate modifications to respond to the local need of that particular agro-geographical conditions, therefore easily replicable in South Asia and other developing countries.

The EVD concept involves the implementation of affordable low carbon, green technological solutions for energy, food and water security interventions, and enhancing livelihood, including promotion, creation and establishment of viable social enterprises, keeping the target community in the centre. The bundle of practices includes technologies like household biogas plants, improved cookstoves, solar PV system, roof-water harvesting, solar greenhouse, solar dryers, organic agriculture and kitchen/home garden technology, household forestry and other need-based development solutions that in majority of cases would also address to climate change related issues.

Through previous projects (2015-18) supported by CISU, INSEDA and INFORSE-South Asia organizations i.e. CRT in Nepal; IDEA in Sri Lanka; Grameen Shakti in Bangladesh, initiated demonstration, built up evidence and advocated for Eco-Village Development in coordination with DIB and INFORSE, Denmark. The concept was tested in smaller area in Ranichauri (Tehri Garhwal district of Uttarakhand state of India) by INSEDA. In order to further scale up the implementation on the ground, and to convince decision and policy makers for replicability of EVD in other areas and regions of the country, it was felt necessary to try new organizational models, to build up capacity of selected local credible NGOs, as INSEDA's partners, and to introduce the concept in other climate zones. This was done during the present new phase of the EVD project in 2019-2020.



Based on experiences with past projects and feedback from stakeholders and decision makers, the need was identified to test out the viability of the concept in larger and/or different geographical areas.

<sup>1</sup> The Feasibility Study was made in 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 Project partners: INFORSE-South Asia coordinators: INSEDA in India, CRT/N in Nepal; IDEA in Sri Lanka; Grameen Shakti in Bangladesh; and CANSA, coordinated by INFORSE and DIB in Denmark. The Project was financially supported by CISU - Civil Society in Development, Denmark. The feasibility study is based on the Eco-Village Development Concept described in Eco-Village Development as Climate Solution, Proposals from South Asia.

**The feasibility study** was, therefore, conducted by INSEDA, in **six tribal dominated villages of Margul Panchayat** of Banka Block in Ratlam district of the Madhyanchal region of Madhya Pradesh state. The focus on tribal communities in the project was considered because they still remain the deprived groups despite various schemes of the government available for their upliftment, at the same time, still living closer to unexploited natural environment. The project area was selected because of the reason that it falls in tribal belt of Madhyanchal region, which has similar geo-climatic and social conditions which makes it easy to scale up through capacity building and advocacy in future involving network of 11 NGOs in Madhyanchal region.



The study was conducted using participatory approach involving village communities and other stakeholders between 23<sup>rd</sup> November to 2<sup>nd</sup> December 2019 in the six villages, viz., Margul, Hawa Rundi, Daulatpura, Dudhi and Kheriyarundi of Margul Panchayat which are 100 % tribal villages. The feasibility analysis of various EVD solutions were carried out considering economic technical, organizational, socio-cultural and political feasibility.



The study reflects that almost all the families are dependent on locally available biomass for cooking and most of the households do not have regular access to electricity due to erratic power supply and unscheduled load shedding. There is water scarcity, particularly during summers, and almost all families depend on agriculture and labour. Few members of families migrate out of their villages, mainly to the urban centres, for around six months for livelihood. The health and education system is very poor and there is no other economic opportunity.

Almost all the families depend on agriculture and labour for survival and do subsistence farming for survival. Most of the households belong to marginal and sub-marginal farmers category with only 2 to 4 bigha land (where 1 Acre is roughly equal to 3 Bigha). The income level is very low where most of the families earn between Rs. 50,000 to 100,000 per year (USD 665 to 1330). There are minimal households' assets with no car in the villages and only 60 to 70% families have mobile phones.



Most of the families own livestock where around 25% of the farmers still use bullocks for ploughing. Most of the houses are mud houses with tiled roofs, while 12.5 % live in huts. Only 5% of the families have functional toilets.



Firewood, dung-cakes and crop residue are the main cooking fuel where traditional stoves are being used in kitchens which do not have proper ventilation. Women face drudgery in collecting firewood and cooking in smoke-filled kitchens. On an average around 7-8 kg wood is used per family per day for cooking 1½ hrs is spent in cooking. LPG is available; however, families use it only in case of emergency. People even have to purchase firewood sometimes @Rs.1200 per quintal. Black soot on vessels and around kitchen walls is considered a problem, while many women also suffer from breathing problems due to smoke in the kitchen.

The education level is very low as there are only primary schools (up to 5<sup>th</sup> standard) and only one upper primary school (up to 8<sup>th</sup> standard) and children have to go distant places to study beyond primary level. The literacy level is very low with only about 30% are literates, which is generally less for women. There are hardly very few graduates.



The health services are very poor as there are no health centres in any of the six villages. Diseases like malaria, dengue, diarrhoea are prevalent with few cases of lung diseases.

The electricity supply is erratic and though villages are considered electrified, several families have not obtained connection. Some of the families, who have connections, but have not paid the bills, and there are unpaid bills accumulated for several months which they find unable to pay. There are no streetlights in any of the villages and the darkness poses danger for women and children as the area is snake infested.

Some families use electric pumps to draw water from wells and from river for which they have to lay pipes every time for long distances. They have to pay a fixed amount as the fee is depending on the size of the electric pump. Few families use diesel pumps for irrigation. There has been heavy loss in agriculture last year due to untimely rains, while a few years back there was huge loss due to drought.



Moong, groundnut, maize, cotton, wheat, soybean, arhar (pigeon peas), urad (one of the beans or black Indian lentil) are the main crops grown in the area, which are mostly used for own consumption, while cotton is grown as a cash crop. Almost all farmers use compost (made in a traditional way, losing the important nutrients and humus) using dung from their domestic animal but after which is dried under the sun.



The forest cover has been reduced to 20% compared to what was 50 years ago and the water level is depleting every year. Negative impact of climate change is being felt by farmers and they are aware of the same. The communities are willing to act on, by taking-up appropriate measures to mitigate impact of climate change and for developing climate resilience, however they have meagre income source. The families, especially women, are keenly interested in carrying out income generation activities to support income along with

kitchen garden using organic methods for income augmentation as well as ensuring availability of nutritious food.

Job opportunity and skill enhancement of youth are considered as key issues apart from ensuring water availability specially during summers. Improvement of health and education services including anganwadis (crèche/ rural childcare centre), road construction, and gully plugs were common issues in all villages. Specific requirements of construction of new check dams/ repair of old check dams, ponds, water tanks, lift irrigation and digging borewell pertaining to specific villages were raised by communities during the study.

After carrying out feasibility analysis, considering economic, technical, organizational, cultural and political feasibility, the EVD solutions were identified for further promotion in the Madhyanchal region, some of which need involvement of Self Help Group (SHG), which is an association of few people (mostly women in rural areas) from similar socio-economic status initiated for thrift and credit and now being involved under various government income generation schemes for efficient implementation.

Some of the EVD solutions found feasible are; Heera (innovated by INSEDA), a multipurpose Hybrid Improved Cookstove (HICS) with chimney, hot water tank, small solar cell powering ventilator/mobile charger, and regular Improved Cookstove (ICS) with chimney, household biogas for cooking, solar PV powered street light, solar lantern with LED, natural daytime lighting, solar drier organized by self-help groups (SHG), Vermi-compost with shade and concrete floor (SHG), Vermicompost - earthworms only, bamboo basket compost, solar poly greenhouse - SHG, rooftop rainwater harvesting and storage tank (built using bamboo reinforced cement mortar), two types of household biogas plants, viz (a) Deenbandhu model (made using brick and cement mortar) and (b) Grameen Bandhu model (made using bamboo reinforced cement mortar (BRCM), kitchen gardening, indoor solar cooking + solar home light system, energy plantation, horticulture, household forestry; as well as, income generation activity through SHG like mushroom, poultry, trading, and basket making.

Based on the understanding developed through discussions with the stakeholders in the villages, as well as, at district and regional level, the level of feasibility of the different EVD solutions in the surveyed villages in different colour coding is given below:

### Summary: EVD Solutions – Level of feasibility in the surveyed villages

EVD Solutions	Feasibility				
	Economic	Technical	Organisational	Cultural	Politically
Heera, a Multipurpose Hybrid Improved Cookstove (HICS)	30 % families could afford	Feasible for all families	Training required	benefits showcase positive feedback	Government distributed LPG but not used
Regular ICS	All families can afford	All families can use the	Training required	benefits showcase positive feedback	Government distributed LPG but not used
Biogas	Only 10% could afford	There are animals, But only 10 % where water is available	Intensive Training	Motivation required	promoted under government schemes.
Solar PV street light	Requires external funding	villages are electrified, but erratic supply	Training in maintenance	safety of equipment against theft	villages are electrified hence low support
Solar lantern LED with mobile charger	All families can afford	no technical limitation	Requires training	No cultural limitation	There are no political limitations
Natural daytime lighting	All can afford	Leak proofing required	Required training	Some may not like to disturb roof	There are no political limitations
Solar drier	SHG* can afford	Anyone can install	Training required	Need to showcase its benefits	There are no political limitations
Vermi compost with shade and concrete floor	SHG* can afford	feasible for 50% families where water is available	Support for earthworms procurement and Training	Need to create awareness to handle the vermicompost	There is support available under government schemes
Vermi compost - earth worms only	All can afford in small spaces	feasible for 50% families - water is available	Support for earthworms procurement/ Training	awareness to handle the vermicompost	support available under govt schemes
Bamboo compost	All can afford,	Feasible for all	Training required	families are making pit compost	There are no political limitations
Poly Green House	5% of farmers can afford	Few can be installed, where water is available	Intensive training is required	Awareness creation required	funding opportunities under govt/ schemes
Rain Water Harvest Tank, Bamboo based	30-40% families can afford	All can install	Training required	motivation required	There are no political limitations
Kitchen garden	Families can afford in small spaces	Can carry out where water available	need to distribute good quality seed	already doing but not organically	There are no political limitations
Day and night Indoor solar powered cooker +solar home light	Needs financial support	All can use	training required	Food habits and adaptation	There are no political limitations
Energy plantation/ Household Forestry	Community can do it with eternal support	Feasible in common land	sapling available with horticulture/forest dept.	community responsibility	Local government support needed
Horticulture	All families can plant	30% can plant where water is available	Sapling to be organised	several fruit trees already available,	There are no political limitations
IGP - Mushroom, poultry, trading, basket making	SHGs can initiate with initial financial support	Several Income Generation Programme (IGP) technically possible	Training/d hand holding marketing support	SHG strengthening required	Government schemes are available
Solar pumps	Funding required	Some farmers can avail having water source	Training required	Security issue is there	Government scheme available
Gully plugging	Funding required	Several sites available	Organising community	Community needs to involve	To be included in Panchayat plan
Micro hydro	Large Funding required	Low flow in river	Lack Capability	No awareness	No scheme as region not suitable
Hydraulic ram Pump	Large Funding required	Low flow in river	Lack Capability	No awareness	No scheme as region not suitable
Micro and Mini hybrid wind (combination of wind + solar PV system) turbine	Large Funding required	There are big wind mills in area	Lack Capability	No awareness	No scheme
Drip/ sprinkler irrigation	Large Funding required	10 % area can be covered	Training required	Awareness required	Govt. support available
Bamboo Housing	Funding required	families can construct small room	Training required	Awareness required	Govt. support available
Solar Box Cooker	All families can install if financial support is available	Enough sunlight available	Extensive training required in motivating to new food habits	food habits and cooking timing do not match	Govt. support available
Solar parabolic cooker	Large funding required	Enough sunlight available	Extensive training required in motivating to new food habits	food habits and cooking timing do not match	Govt. support available

\*SHG- Self Help Group \*\* IGP- Income Generation Programme

High Feasibility level	Medium feasibility level	Low Feasibility level
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Contact to INSEDA: [www.inseda.org](http://www.inseda.org)