INFORSE-South ASIA
International Network for Sustainable Energy

Eco-village Development as Climate Solution

Policy Brief by INFORSE and CANSA, June 2015

Executive Summary

More than half of the South Asian population of 1.7 billion people live in rural areas and many of the poverty problems of the region are in the villages. Sustainable development in the villages has the potential to enhance the living conditions and to reduce rural-distress & poverty-induced migration to cities. To develop villages in sustainable ways, a number of issues need to be addressed and adequate solutions supported. This includes energy access, sanitation and safe drinking water, access to information, improved health care, and others. When the solutions are sustainable, local and reduce poverty, they are effectively leading to "eco-village development (EVD)".

The key to successful application of these local solutions include resources including finance, supporting policies, training, quality control and involvement of civil society. Supportive policies for these local solutions include directing subsidies to energy access; financing for up-front cost that are often higher for the local EVD-solutions, even when they are cost-effective; support for technical development and quality control; policy coordination; and involvement of civil society,

International cooperation is also important for large-scale success with local solutions, including climate funding for EVD and other local solutions to be included in a short term "Leapfrog Fund" and in a long-term climate agreement. Additionally the UNFCCC climate-technology mechanism could contribute with exchange of knowledge, experience, and technologies, as well as adaptations to the specific conditions.

Existing Challenges & Alternatives

In India alone 612 million poor people struggle for access to energy, sanitation & drinking water, good nutrition and health, out of which several live in villages or have migrated to cities still maintaining linkages to their villages. There are issues identified with centralised solutions development model in the past decades requiring an alternative approach to fast-track poverty alleviation with co-benefits for climate.

Issues with Centralised Solutions: In many cases the centralised solutions are not efficiently supporting the local development. Rural grid electrification does not provide stable electricity supply everywhere, limiting the possibility for commercial uses, healthcare or stable lighting for homes and streets. Often cooking with LPG is not affordable and then villagers have to return to unsustainable use of burning cow-dung cakes or wood in inefficient cooking stoves. The centralised energy solutions also come with increased emissions.

Decentralised Eco-village solutions: A long range of proven decentralised solutions exist to provide energy for village development with better use of local resources and with very low emissions. These solutions can overcome the problems of unstable supply and affordability that come with the centralised solutions. In specific cases these local, sustainable solutions have shown their value for millions of people using them, such as improved cookstoves in Sri Lanka, solar (PV) home systems for electricity in Bangladesh, and family biogas plants in India.

Lack of Policy Support to Eco-solutions: In spite of these large-scale successes the prevailing development strategies in the South Asian countries are still focussing on the centralised solutions. In the past 15 years of Millenium Development Goals (MDG) campaign to eradicate poverty, this has been a huge missed opportunity for South Asia to reduce poverty in sustainable ways and with lesser greenhouse gas (GHG) emissions.

For these reasons we want to increase the focus on local, eco-village development (EVD) solutions, in particular for villages where centralised solutions are unavailable, unreliable, and/or unaffordable. Local EVD solutions must be in focus in the national and regional policies of South Asia as well as on the international agenda.

Key to Success of Eco-Local Development

- Successful dissemination of thousands or even millions of sustainable energy installations shows that the barriers can be overcome. The key to overcoming barriers and to successful application of local solutions to enhance development with poverty reduction include:
- Resources including finance, tax incentives, subsidies, technical staff for local solutions - subsidies from fossil fuels must be shifted to energy access through local solutions.
- Policy & communication support to local solutions by governments and by the international society
- Exchange of knowledge, insights from experiences, and technologies must be promoted along with training, to women particularly who are the actually engaged at the ground level as users that need practical, implementable local solutions. There should also be provisions for availability of spare parts and maintenance.
- Quality of products must be sufficiently high**.**
- Civil society organisations must be involved to bring in their experiences and use their capacities to disseminate solutions. Civil society can also help to ensure transparency and improve outreach to, for instance, women and poor people.

Supportive Policy Frameworks

Development to reduce poverty based on local EVD solutions will require concerted actions at policy level. Some of the policy issues to be addressed to allow development with EVD solutions are:

- **Subsidy and policy reform:** Subsidies to fossil-fuels and for grid extension are far higher than public financial and technical support for local, sustainable solutions. A subsidy & policy regime reform is important to encourage uptake of EVD solutions.
- **Financing the up-front costs of installation, training and spare parts:** Even though some local solutions are cost-effective compared with centralised solutions, many poor people cannot afford the up-front cost of installation, spare parts, and training, which is in some cases higher than that of the central alternative, in particular when the latter is subsidised. Financing mechanisms and, in some cases subsidies, typically are needed for large-scale success of local solutions.
- **Financial support for technology development & quality control**: Even though the local sustainable solutions have successfully existed for a few decades, such as Anagi cookstove in Sri anka these solutions are still developing fast. With adequate financing such technological developments open up new local solutions that were not feasible as drivers for development earlier. There is also a need for continued quality control, also of more mature solutions.
- **Cross-sector policy coordination:** There is a need for coherence amongst various laws and policies as well as for coordination amongst various ministries and departments relevant for rural areas administration and development;
- **Engaging the civil society:** There is a need for open & transparent policy frameworks encouraging civil society engagement for wider dissemination of solutions as well as solution to ground challenges.

INFORSE-South ASIA
International Network for Sustainable Energy

CANSA

Importance of International Cooperation

While national and sub-national development programmes must address policy issues to successfully promote development with local solutions, international cooperation is also important for large-scale success.

Climate funding can provide some of the resources for EVD and other local solutions with low greenhouse gas emissions. This should be a priority in the coming long-term climate agreement at COP21, while it should also use existing international aid. In the short term a 'Leapfrog Fund' should be established from global mitigation finance to support South Asia in moving towards a low-carbon economy, with focus on EVD solutions,

The UNFCCC climate-technology mechanism could contribute additionally to the facilitation of the exchange of knowledge, experience, and technologies,. This must include solutions from the North as well from the South. It should also support possible improvements, adaptations, and optimisations of technologies and solutions to the specific national or, eventually, local conditions.

Improved Cookstoves

Improved cooking stoves can reduce wood use by about 50%, and in places where use of biomass as fuel is a major contributor to greenhouse-gas emissions, increased cooking efficiency is key to reducing CO_2 emissions. Improved stoves also emit a considerably lower volume of particulates than traditional cooking fires. Around mountain areas with glaciers, their use reduces deposits of black soot from cooking smoke on the ice, another distinct contributor to climate change.

In South Asia, Sri Lanka's stove programme stand out as a large-scale success in reducing biomass use with improved cookstoves. Today the stove dissemination is fully commercialised and about 400,000 stoves are produced annually by 185 rural potter families and sold via a network of private traders and sellers dispersed throughout the country. This reduces greenhouse gas emission around 1 mill. tons of CO_2-equivalents/year, equal to a about 8% of Sri Lankan CO_2-emissions from fossil fuel use. External support and consistent efforts of key NGOs and institutions over many years has lead to this remarkable result.

Solar Electricity

Solar electricity can replace kerosene used for light. It also can replace diesel to power, e.g., pumps, and agricultural machines. In countries where central power supply is based on fossil fuel, especially in the case of coal, solar electricity will also reduce CO_2 emissions substantially compared with grid connection.

In Bangladesh Grameen Shakti (GS) has achieved a milestone by improving the rural livelihood through access to green energy. More than 1.5 million solar home systems have been installed through its micro-credit system. Around 10 million people are getting benefit from the systems, and over 350,000 tonnes of CO_2 are saved each year because of this.

Improved Water Mill (IWM) and Small Scale Hydropower

Nepal has a tradition of water mills, and based on this tradition Nepalese people has developed improved water mills (IWM), IWM technology increases the efficiency and output compared with the traditional water mills. IWM projects have given opportunity of employment generation within the country for IWM kit manufacturing company, service centers based in the districts and the beneficiary communities. IWM can grind grain faster than traditional water mills and can also be used for various purposes like partial polishing of rice husk, expel oil from oil seeds, and generation of electricity (1-3 kW).

Availability of IWM services in the locality helps to increase in resilience of the community and also reducing the drudgery, especially of the women and girl children. It has been calculated that IWMs can reduce emission by 3 - 4.5 ton CO_2/year by replacing diesel-driven machinery. The 8,500 IWMs currently installed in Nepal, are thus reducing CO_2 emissions with about 38,000 tonnes of CO_2/year.

In addition to IWM are installed 2800 pico-, micro-, and mini-hydro plants with a combined capacity of 42 MW. Their power is used for light and business ventures like agro processing, carpentry, communication centers, poultry. The productive use of energy generated from small hydro has given the opportunities of employment and additional income to the rural people. It has also enabled women to be involved in productive activities in the evening after they are done with their household chores.

Combined the solutions: Eco-Village Developments

In India several organisations are combining local solutions into sustainable "eco-village developments", among others based on the successes with millions of family-size biogas plants now used in India.

One example is a renewable-energy based eco-village development project, which is a joint effort of WAFD (Women's Action For Development) and INSEDA (Integrated Sustainable Energy and Ecological Development Association) to demonstrate how several such local solutions can enhance development

Among the solutions are biogas plants, bamboo building materials, solar drying, composting, and rain-water collection. In these projects focus are on the how the development process, assisted by the capacity-building of 'end users', makes these interventions sustainable and enduring even after the withdrawal of the national organisations at the conclusion of the project period. This capacity building helps receptive communities to develop their villages into eco-villages and to evolve their own responses to climate change and development-challenges.

This paper is based on the first findings within the Project "Evidence based advocacy for low-carbon, pro-poor sustainable "Eco-Village Development "(EVD) in South Asia".

Read more about the project at www.inforse.org/asia, www.dib.dk, and www.cansouthasia.net