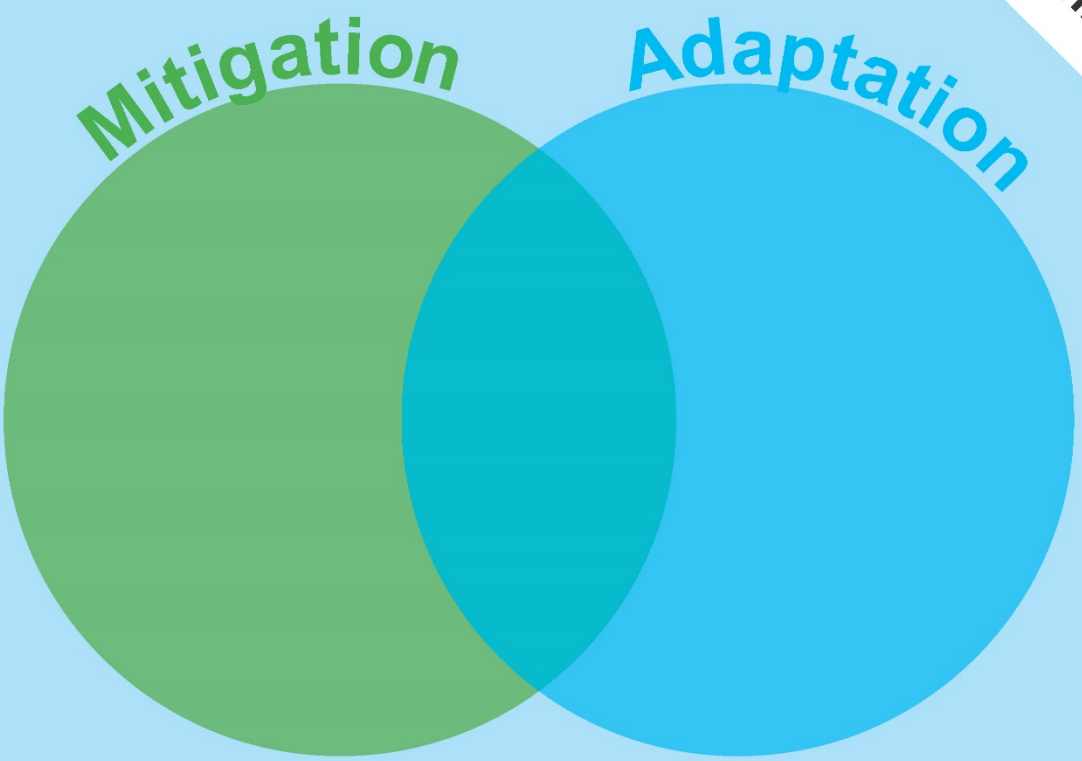
White Paper



SUMMARY FOR POLICY MAKERS

WHITE PAPER
Climate Mitigation and Adaptation with Eco-Village Development (EVD) Solutions in South Asia

2nd Edition, October 2018

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White Paper on Climate Mitigation and Adaption with Eco-Village Development (EVD) Solutions in South Asia

SUMMARY FOR POLICY MAKERS

2nd Edition, October 2018

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Read more on the project and download the full White Paper and other publications from http://www.inforse.org/asia/EVD.htm and http://www.ecovillagedevelopment.net/

Summary for Policy Makers

This White Paper *"Climate Mitigation and Adaptation with Eco-Village Development (EVD) Solutions in South Asia"* analyses and presents climate-effects of EVD solutions, using existing cases from villages in South Asia. EVD combines village-level developmental planning with local sustainable solutions to give villagers climate-resilient supplies of energy, water, agricultural products, and other necessities and livelihood improvements, depending upon the choices of the villagers.

The authors select six high-impact EVD solutions and describe the importance of each in mitigation of climate change and adaptation to climate change. Improved cookstoves, household biogas plants, solar home systems, renewable energy mini- and micro-grids, solar drying, and organic farming (including composting) have been found to reduce greenhouse-gas (GHG) and particle emissions considerably while improving quality of life.

The analysis covers all substantial greenhouse emissions that the authors could identify and quantify, gases as well as particles of black carbon. Adaptation benefits are identified as well, but not quantified. The selected high-impact EVD solutions are analysed in the chapters 3-8. Chapter 9 presents examples of total village-level GHG-emission reductions.

The following table briefly summarizes the six key technologies and their major climate impacts.

EVD Solution	**Mitigation Impact**	**Adaptation Impact**
Improved Cookstove (ICS) Technologies	In households: GHG and black-carbon emissions from cooking are reduced by 1-3 tons CO_2 - equivalents (CO_2e) per family per year.	Not assessed (n.a.)
	In village and household industries, GHG and black carbon emissions are reduced significantly.	n.a.
Household Biogas Plants	GHG and black carbon emissions from cooking and agriculture are reduced by 1 - 4 tons CO_2e per family per year.	Soil improvement
Solar Lighting	Use in homes reduces CO_2 emissions from kerosene and other non-solar light sources by roughly 0.34 tons per family per year.	Provides light during cyclones
Solar or hydro micro- and mini-grids	Typical reduces CO_2 emissions from uses of electricity and/or of diesel engines by 0.7 tons per family per year.	n.a.
Solar Dryers	Typically reduces CO_2 emissions by 1.4-3 tons per year when solar drying replaces electric or fossil-fuelled dryers.	Preservation of food in changing weather
Organic Farming & Gardening, Including Composting	Organic practices replace GHG producing N-fertiliser, increase soil carbon, which reduces CO_2 emissions from agriculture. It is difficult to quantify emission reductions.	Improve soil for moisture retention. Crop rotation gives more stable yield in changing climate

From the selected case studies, the authors find the following village-level climate mitigation effects:

- For every 100 households adopting the selected EVD solutions, emissions can be reduced by nearly 500 tons of CO_2 - equivalent (CO_2e)/year compared with a baseline of traditional provision of cooking and light, such as electricity from kerosene, diesel, or the Indian central power grid.
- In two examples based on actual villages with 50 and 70 families, EVD solutions reduce GHG emissions by respectively, 546 and 114 tons of CO_2e/year, while helping the villagers with better energy and livelihoods.
- For a cluster of several villages, emission reductions with EVD solutions are estimated to be around 1800 tons CO_2e/year by the end of the implementation, which provides improved cooking technologies and solar dryers to 250 households.

Analysis of the range of EVD solutions reveals that the greatest mitigation benefits and co-benefits come from improvements of cooking technologies. Of the cooking practices analysed, use of biogas delivers the highest GHG reductions. The next-highest potential for mitigation comes with changing to renewable energy use for electricity. In some villages, other energy uses, such as brick-making, give high emissions.

Some of the emission reductions discussed here are recognised internationally today and are eligible for support from the Clean Development Mechanism (CDM), Gold Standard, and other emission-reduction projects. This is particularly true of CO_2 emission reductions from introduction of improved cooking technologies and of solar home systems. The GHG reductions that the authors identify in two of the three village case studies encompass and surpass these recognised benefits because they include all GHGs, such as black-carbon. Emissions of these previously overlooked greenhouse-effecting particles are considerably reduced with improved cooking solutions.

A smaller but significant GHG reduction comes with the inclusion of solutions, which are normally not covered by CDM projects. In this analysis this is the case of the solar dryers.

Importantly, this White Paper points out significant, verifiable, cumulative climate benefits from combined solutions with emphasis on climate mitigation as well as on climate adaptation benefits.