

INFORSE - SUSWATCH - INSEDA - CCDB – SE

UNFCCC COP 25 SIDE EVENT 13/12 2019 13:15-14:45 ROOM 6



# Local Climate Solutions with Poverty Reduction in NDCs. Experiences from South Asia

## Eco-Village Development in India

by Dr. Raymond Myles, INSEDA , India



Proceedings: <http://www.inforse.org/cop25.php3>



**Operational area of INSEDA's eco-village development (EVD) programme in 6 villages (located at a height of 5000 to 6500 ft above the sea level) in Tehri Garhwal district of Uttarakhand state in sub-Himalayan region of India, showing local women volunteers of INSEDA**



**local women volunteers**



## Three of the eco-villages around INSEDA's Ranichauri/Gurali centre, Tehri district of Uttarakhand State of India



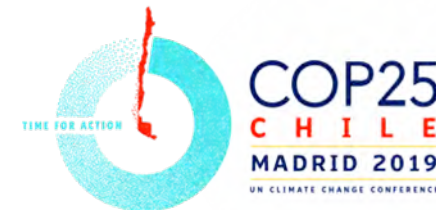


One of the local village women and her daughter from one of the six INSEDA's EVD project in the Himalayan sub region of India, are carrying wood to be used as firewood in their Traditional cook stove before INSEDA introduced its Innovation (HEERA), a multi-purpose Hybrid Improved cook stove (HICS)





# Innovation of HEERA, a multi-purpose hybrid improved cookstove (HICS) for implementation within the EVD program of INSEDA in Tehri district



## Problem/Need of HICS within the EVD program

INSEDA had been involved in the innovation and promotion of low carbon, green technologies within its Eco village development (EVD) program covering six villages in Chamba block of Tehri district of Uttarakhand, since January 2011.

As a first step the innovator of Multipurpose, Hybrid Improved Cook Stove (HICS), decided to find out the problems/needs of the villager related to domestic cooking and other domestic energy related issues.

Following problems and needs were expressed by the women, which could be addressed and incorporated in the new Cook Stoves model:

1. Village women were still using inefficient traditional Cook stove, and required an efficient improved cookstove (ICS) which could save firewood/biomass for cooking so that they don't have to walk down the hills to collect them, especially during rainy season.
2. Saving in additional firewood in warming water for domestic purposes throughout the year, more so during the winter months.
3. Saving in additional firewood/biomass for warming their houses till they go for sleep during the nights in winter months.
4. Their kitchen roofs were very low and less ventilated as well as dark (due to less light), so cooking was inconvenient for women and adolescent girls during the late evenings and nights, as there were no lights in the kitchens..
5. Smokey kitchen and indoor pollution was causing respiratory, eyes disease and other health related problems to women.
7. The smoke & flue gases from their existing cook stoves were getting released in the atmosphere, causing outdoor pollution.





## Advantage of proposed Innovating, a Multi-purpose Hybrid Improved Cookstove (HICS) over the traditional & other improved cook stoves (ICS)

### □ Opportunity and Challenge

An innovation to develop a multipurpose hybrid improved cook stove (HICS) would not only provide opportunity & challenge for INSEDA's EVD program in Tehri district of Uttarakhand state; but would also be ideal for rural kitchens through out India and for other developing countries, as it would solve the following key problems:

1. Reduction of both indoor and outdoor (atmospheric/environmental) pollution.
2. Less time would be required for cooking in rural kitchen as it would have provision of cooking two meals (as there are would 2 openings for placement of 2 cooking pots at the same time.
3. Would require Less firewood and biomass for domestic cooking.
4. Reduction of respiratory and eyes problems as there would be no smoke inside the kitchen.
5. Integration of water tank with the exhaust pipe would be used for warming water by utilizing the waste heat from smoke and flue gases, which is not being utilized at present.
6. Combination of Solar panel with Solar Battery and Charge Controller, to operate a battery-operated exhaust fan for pushing the flue gases through the exhaust pipe of this multipurpose, hybrid Improved Cook Stove (HICS) into the water container/bucket (which could be kept on the roof of the rural houses) to filter harmful gases and allowing to settle the harmful particulates before releasing the smoke in to the atmosphere.
7. Additional advantage/benefit of Solar battery with charge controller/battery regulator, would be to use a LED bulb in the kitchen when it is dark; as well as would charges a mobile phone at the same time.





Operation of this multipurpose, hybrid improved cook stove- in short HICS (named as “HEERA” by its innovator, Dr. Raymond Myles, INSEDA) is integrated with tank for warming water and solar panel for charging battery for operating an exhaust fan for removing smoke from kitchen for preventing indoor pollution and for reducing certain percentage of outdoor pollution





**Connection of the exhaust pipe of the hybrid improved cook stove (HICS) to the bucket of water, kept outside two different houses for absorbing the harmful particulates from the smoke & flue gases before releasing the same to the atmosphere, thus checking brown and black carbon build up in environment.**

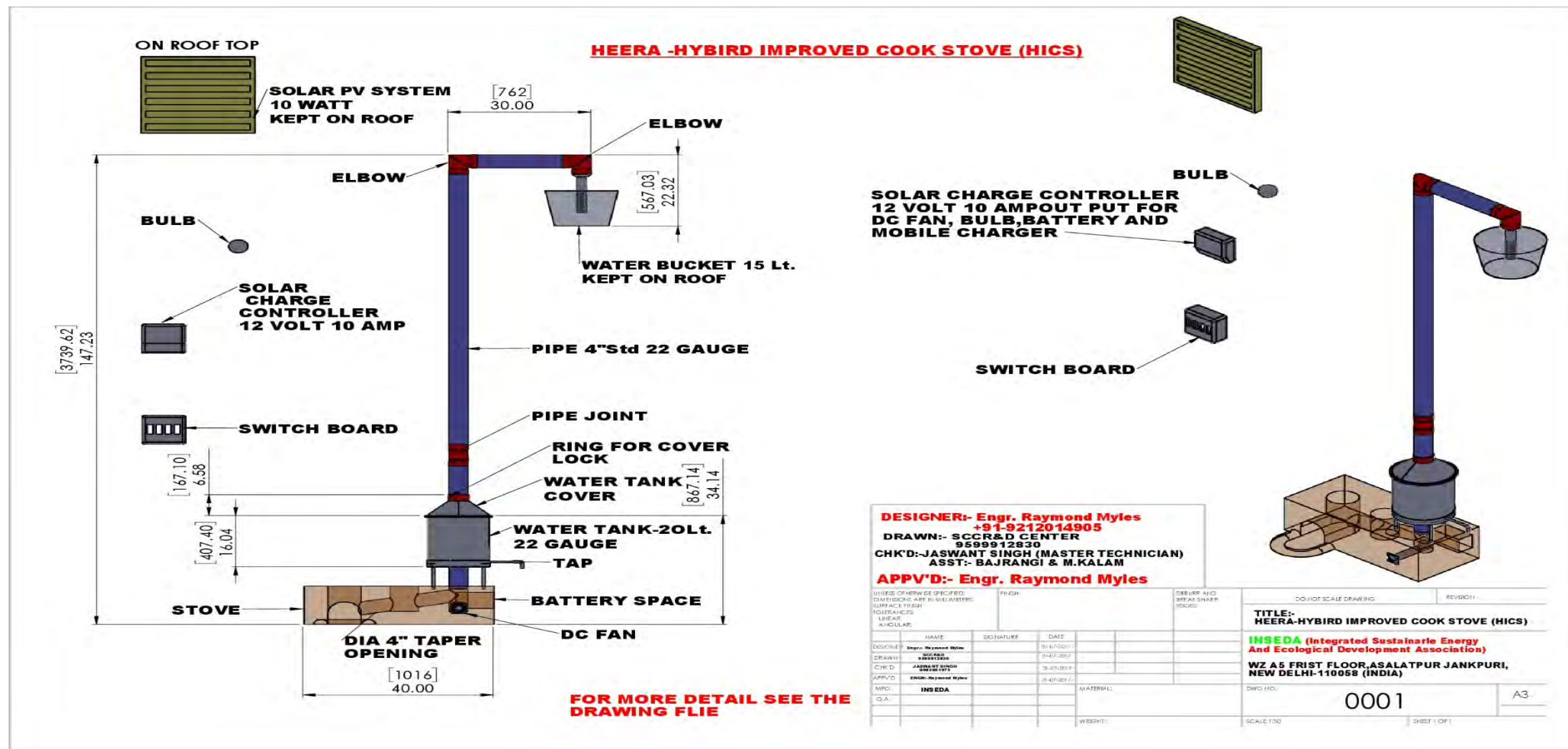


**COP25**  
**CHILE**  
**MADRID 2019**  
UN CLIMATE CHANGE CONFERENCE





# Important Technical Details of the Innovation named as HEERA, which is a Multipurpose, Hybrid Improved Cook Stove (HICS)





# HEERA, a Multipurpose, Hybrid Improved Cook Stove (HICS)

The pictorial representation of HEERA , which is a low carbon, green technological local solution for empowering rural women in biomass based domestic Cooking



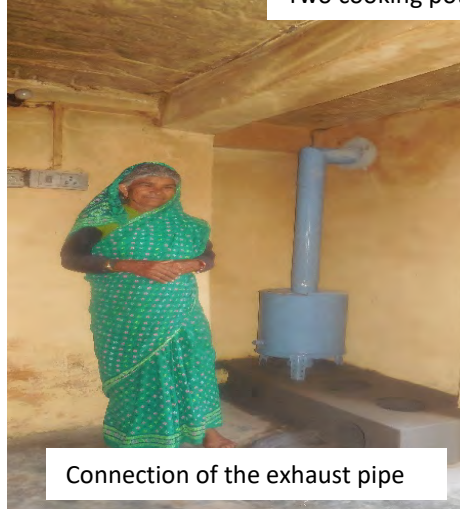
Two cooking pots



Waste heat warms the water in the tank



An LED bulb is provided in the kitchen powered by the solar panel



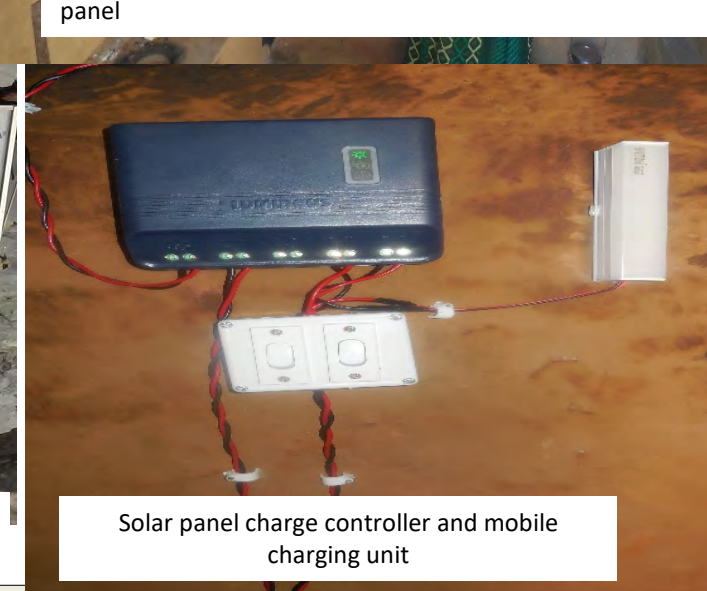
Connection of the exhaust pipe



Exhaust pipe inserted into a bucket of water to filter the smoke



Solar PV panel on the roof



Solar panel charge controller and mobile charging unit



## ❑ **Novelty of the Innovation: The HEERA, Multipurpose, Hybrid Improved Cook Stove (HICS)**

- Apart from cooking two dishes simultaneously, it can also warm water continuously using the waste heat (smoke and flue gases) being released outside through the exhaust pipe.
- The upper end of the exhaust pipe goes inside the bucket full of water, normally kept on top of the roof. The smoke with flue gases are released inside the water and captures the particulates and some of the other harmful substances, mainly consisting of brown carbon, allowing only the filtered gas (which is much cleaner and less harmful) before releasing in the atmosphere/environment. Thus, at least 40-50% of black and brown carbon is expected to be deposited in the water.
- There is a 15-20 litre water tank integrated with the exhaust pipe for using the waste heat from the exhaust gases to continuously warm the water to be used for domestic purpose, this saves dried biomass/firewood as compared to other traditional stoves and ICS, which separately warms water.
- To ensure that the exhaust gases are effectively released in the water bucket, a small exhaust fan is integrated with the HICS, with an opening at the beginning of the exhaust pipe.
- To ensure that the fan is operated even in the areas where there is no electricity or when there is interruption of power, the system also incorporates a 12-volts 7-amp Battery, which gets charged through a Solar PV panel installed on the roof, and a 'Charge-Controller' or "Charge Regulator" is also installed inside the kitchen, to protect against the over voltage/overcharging, and thus protecting the battery.
- And a 5-watt, LED bulb provided inside the dark kitchen is operated from the battery. It also has a provision to charge the mobile phone



# Comparison between other ICS and HICS

Comparison between important features of ICS and HICS	Improved cook stove (ICS)	HEERA, a multipurpose hybrid improved cookstove (HICS)
Checking Environmental pollution	Still causes environmental pollution.	Outdoor (Atmospheric/Environmental) pollution is reduced considerably.
Health problem due to indoor smoke	There is either no or comparatively much lower indoor pollution due to smoke, as compared to the traditional cookstove.	There is almost zero indoor smoke and no indoor pollution during cooking and warming water
Time consumption	In most of the cases, it can cook two meals at the same time, but consume additional fuelwood for warming water	It can cook meals/dishes at the same time, also warms water, with no additional fuelwood.
Fuel efficiency and saving in fuel wood and biomass	Lesser consumption of fuelwood/biomass compared to traditional cookstove.	Lesser consumption of fuelwood/ biomass compared to all the traditional cookstove, and also saving in fuelwood, as compared to other ICS, when water is also warmed.
Waste heat utilization	No waste heat utilisation.	Waste heat from the smoke and flue gases is used for warming water simultaneously, as the water tank is the integral part of the smoke exhaust pipe.
Solar PV panel with battery and charge controller	To our knowledge, no solar panel integrated in any ICS.	Solar PV panel integrated with the HICS to push the smoke and flue gases with force in the bucket full of water to reduce atmospheric pollution. The solar PV operated battery charges a mobile and light the kitchen when it gets dark.



Connection of the exhaust pipe of the hybrid improved cook stove (HICS) to the bucket of water, kept outside two of the houses for absorbing the harmful particulates from the smoke and flue gases before releasing to atmosphere





# Thank you

## Contact details:

Dr. Raymond Myles (Innovator HEERA, Multipurpose, Hybrid Cook Stove)

Secretary General-cum-Chief Executive, INSEDA, and

INFORSE Regional Coordinator, South Asia

First Floor, WZ, A-5, First Floor, Asalatpur,

New Delhi-110058, India

Mobile No: +91-9212014905 and +91-9899094905

E-Mail ID: [ray.myles06@gmail.com](mailto:ray.myles06@gmail.com)

Website: [www.inseda.org](http://www.inseda.org)