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Newsletter

# Project Progress

PROMOTING INNOVATIVE ENERGY SOLUTIONS WITH ULTRA LOW HEAD MICRO-HYDRO POWER TECHNOLOGY IN INDIA

*Increasing Access of Rural Communities to Renewable Energy for Productive Purposes in India*

## Green Growth through Innovative Micro Hydro Energy Solution

Across the globe, energy agenda is being shaped by two predominant factors of addressing energy security through reliable, affordable and sustainable forms of energy, and need to shift energy production and consumption towards cleaner, efficient and greener patterns to develop climate resilience.

UNIDO in the state of Uttarakhand (India) is working in hydro based renewable energy sector by showcasing an innovative Japanese technology of Ultra Low Head – Micro Hydro Power (ULH-MHP) since 2013 along with Ministry of New & Renewable Energy (MNRE), Government of India and Uttarakhand Renewable Energy Development Agency (UREDA), Government of Uttarakhand. The project objective is to demonstrate 3 units of 10 kW each in different geographical locations to showcase diversity in its usability and support community based enterprise through the use of green energy. This innovative solution generates around 10 kW of electricity by utilizing ultra-low head (below 3.0 m head of water fall) range and available water discharge of 0.8-3.0 m<sup>3</sup>/s in an existing canal.



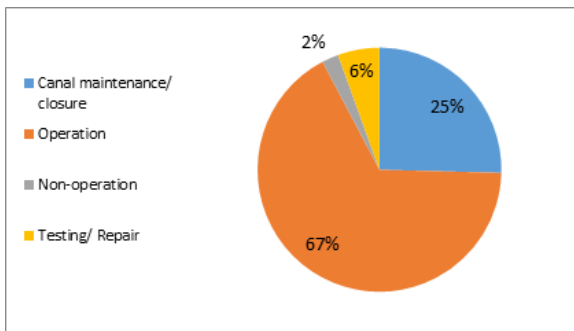
This project aims to increase the access to renewable energy for various productive uses by local communities and act as an example of decentralized power generation option in the mountain state of India. In the project, the capacity of local people will be built upon various aspects of micro hydro development through institutionalization of ULH-MHP sector by developing local knowledge hub and mainstreaming this new technology application in energy-water nexus. In addition, the capacity of the local villagers developed on the operation of such technology, enterprise development, book keeping, business development and marketing of agro based products. The technology transfer from Japan to India has already started and the second and third systems have been manufactured indigenously.

This newsletter contains the brief of various ongoing and completed actions including the developmental stage of Community based Enterprise (SME) in the second and third project sites after the successful installation and demonstration of 10 kW system at Hydraulic Research Station, Bahadarabad of IRI in Haridwar (Uttarakhand) India.



## Energy Need in Indian context

India has 3.8 GW installed capacity of hydro power against the available potential capacity of 20 GW. It has been recorded that the world energy-induced CO<sub>2</sub> emissions will increase by 57 percent during 2005–30, of which India will account for 14 percent. In India, about 0.4 billion population (45 percent rural and 8 percent urban households) do not have access to electricity (IEA, 2012), while 90 percent in rural and 33 percent of urban households do not use clean cooking fuels.



## First Successful Installation in India

*At Irrigation Research Institute in Uttarakhand successfully tested and monitored*

## ULH-MHP HIGHLIGHTED IN SE4All in NEW YORK

A 10 kW ULH-MHP (Ultra Low Head Micro Hydro Power) unit was installed in Dec 2013 which was tested successfully by Alternate Hydro Energy Centre, IIT Roorkee (India) for its output in July 2014. The machine is running successfully and generates about 70,080 units of electricity annually which can provide the owner a revenue of approx. INR 3,00,000 annually.

The site has been visited by over 200 delegates from India and overseas since its installation for study and research purposes.

The overall running status of the machine at this site was closely monitored by IIT Roorkee (India) for a period of six months. The result shows smooth running for 67 percent of the duration, canal closure for 25 percent time due to maintenance work. Hence, a total 92% of the time there

were no-incident of the system. This unit will be handed over to Irrigation Research Institute of Government of Uttarakhand.



The compendium report of UN agencies in India during Sustainable Energy for All Forum held in New York during 4-6 June 2014 presented the first pilot demonstration of ULH-MHP project from India in Opportunities and Accessibility section. The forum highlighted various energy dimensions in terms of accessibility, availability, affordability and accountability. The document says that, "UNIDO is working with the Government of India to demonstrate technologies such as micro-turbine that are readily available and can provide reliable energy to villages without harming the local environment. Increasing the deployment of such solutions will help improve energy availability in rural areas." It further highlights about the progress in increasing the installed capacity for electricity generation and extension of the grid in rural areas. Due to perennial demand-supply mismatch, electricity supply especially in the rural areas remains erratic and unreliable with consumers receiving electricity supply for less than eight hours a day.

*'70,080 units of electricity can be generated...over 200 delegated visited for study and research purposes from India and overseas to IRI'*

## ULH-MHP Included in Policy

*MNRE Focus on Micro-Hydro Development and included ULH-MHP in its Policy Guidelines*

In July 2014, with the advocacy efforts of UNIDO in India on ULH-MHP technologies, Small Hydro Division of MNRE Government of India has recognized and included such micro hydro technologies in its policy guidelines to provide support to the interested individual entrepreneurs, local bodies and cooperatives. MNRE has made a provision of Central Financial Assistance of INR 125, 000/ kW for micro hydro projects up to 100 KW and also encourages the development of such innovative technologies through local government system, individuals and small enterprises. It also has provisions of financial support for the preparation of detailed project report (DPRs) in micro-hydro and small hydro project site development with more R & D and trainings to local people and enterprises.



## PSC Meets in 2014

*A 3<sup>rd</sup> Project Steering Committee Meeting held in Sep 2014*

The 3rd PSC meeting took place at New Delhi with the presence of representatives from NEDO (Japan), MNRE, UREDA, AHEC (IIT Roorkee), Irrigation Department and UNIDO. PSC Chair from MNRE informed about various decisions of PSC meeting like grid connectivity of IRI, regular operation of machine at IRI with its monitoring by IIT Roorkee. Localization of ULH-MHP machine was appreciated while MNRE agreed for co-financing in proposed Master Plan survey in Uttarakhand. UNIDO agreed for partial financial support in proposed International Hydro conference 2015 by Government of Uttarakhand. The discussion on the establishment of a Watermill Development centre in the state of Uttarakhand and inclusion of NGOs for community facilitation at next two pilot sites was also carried out.

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