

IIT Delhi Unnat Bharat Abhiyan

Gandikata cluster smokeless stove progress report

Smokeless cook stove/ Kitchen - संकुल के सभी गांवों में इंधन के लिए लकड़ी का उपयोग काफी प्रचलित है जो की आसानी से उपलब्ध भी हो जाता है, रसोई के धुंवा से सबसे ज्यादा महिलाये और बच्चे इसके भुक्तभोगी होते है | आई आई टी दिल्ली के ग्रामीण विकास एवं प्रोद्योगिकी केंद्र में विकसित TEG कुक स्टोव का प्रदर्शन कर एक एक स्टोव पांच गांव में उपलब्ध कराये गए प्रति चूल्हे की लागत 5800/- रुपये थी जिसके लिए ग्रामीणों को कोई मूल्य नहीं चुकाना पड़ा इसके लिए निधि ONGC CSR निधि से प्राप्त हुवा था | उसके बाद दस और चूल्हे ग्रामीणों की माँग पे उन्हें उपलब्ध कराये गए जिसके लिए उन्हें 1000 रुपये का सहयोग राशी उन्होंने दिया | धुंवा रहित TEG कुक स्टोव के उपयोगकर्ताओं का एक समूह बनाया गया जो की धुंवा रहित रसोई के लिए जागरूकता का कार्य करते है तथा इसी समूह के नाम से स्थानीय बैंक में इनके दो सदस्यों का एक जॉइंट बचत खाता खुलाया गया | इसके कुछ समय बाद TISS तुलजापुर के छात्र गैणडीखाता संकुल को अध्ययन के लिए आये जिसमे यह निष्कर्ष निकला की TEG कुक स्टोव खराब होने पे ग्रामीण इसे मरमम्त नहीं कर पाते है, तथा उनकी 4 - 5 लोगो के लिए भोजन बनाने के भी अनुकूल नहीं है | इसके बाद ग्रामीणों के जरूरत को ध्यान में रखते हुवे तिन युवावों को प्रसिछन देकर सोलर सपोर्टेड कुक स्टोव जो की TERI एवं आई आई दिल्ली के संयुक्त शोध से बनाया गया था, पांच गांवों में एक एक उपलब्ध कराया गया | जिसकी लागत 3000/- रुपये एवं उपभोगता का योगदान 500 रुपये था | इस धुंवा रहित चूल्हे को ग्रामीणों ने बहुत उत्सुकता के साथ देखने आने लगे और कई परिवारों ने इसे लेने की इच्छा जताई परन्तु COVID महामारी के कारन धुंवा रहित नए चूल्हे तो इन गांवों में नहीं आये लेकिन गांव के कई परिवार नए तरीके से अपने रसोई को धुंवा रहित बनाने में जुट गए है | संकुल में जो नए घर बन रहे है उनके धुंवा रहित रसोई के लिए स्थाई चिमनी का निर्माण किया जा रहा है | अब ग्रामीणों में धुंवा से होने वाले नुकसान के प्रति जागरूकता साफ देखा जा सकता है |



धुंवारहित TEG कुक स्टोव का प्रदर्शन ग्रामीणों के लिए उन्नत भारत अभियान के सहयोगी नवरंगबाद एवं गैणडीखाता में करते हुवे | (July 2019)



संकुल में धुंवारहित रसोई के लिए जागरूकता काफी बढ़ी है, कई परिवार स्वयं स्थाई चिमनी का निर्माण कर रहे हैं | (January 2023)

Name of the project - TEG cook stove progress report

Sponsored organization – ONGC

Introduction

Wood burning fires are an exceedingly common way to generate heat for cooking in much of the rural area. During the combustion process carbon and other harmful emissions are emitted into the atmosphere and into the lungs of those who cook. Clean burning, efficient cookstoves drastically reduce the fuel that is required and the harmful emissions that are necessarily generated. In Gandikhata cluster that are changing lives and our 16 cookstove will incorporate advanced thermoelectric energy generation into a similarly fuel efficient cookstove design. increasing the burn efficiency of the fuel; less ash will be produced and less fuel will be consumed. Excess electricity generated by the thermoelectric units is used to charge basic mobile phone and LED light. Ultimately, cutting edge technology will be used to enhance classic cookstove designs and reduce the cost to cook food in all UBA adopted villages.

The principle behind TEG is to convert waste heat as heat source into electricity, which is regarded as totally green technology since the input energy is totally free of cost, and the output of the of the TEG module is of high importance due to its power generating feature and making the cookstove economically viable. On the advent of semiconductor material science the thermoelectric generation practical applications got high emphasis of conversion of waste heat into electricity. The features like reliability and ruggedness of semiconductor material that came from solid state function has made this technology more viable and useful. The advantages of TEG integrated with cookstove are that the flame heat from the cookstove

serves as input to the TEG and no extra energy is required, the TEG module is incorporated in the wall of the cookstove, unlike solar panel it do not require external electric link. The module is used to charge battery and run equipment's, the TEG have no moving parts hence the operation is silent, TEG is very rugged and almost maintenance free; whole module is placed indoor and no moving parts only battery needs replacement when exhausted or can be recharged with module power continuously, TEG starts working as the cookstove is set on fire irrespective of day and night, windy or rainy weather unlike solar panels. Rechargeable batteries serve the purpose and need not be oversized batteries as used in solar panels to store energy.

Project Area

Gaindikhata cluster is located nearly 25 km away from Haridwar towards Nazibabad on the NH-74 and have thirteen wards of Gaindikhata Panchayat with an approximate population of 6000-7000 which constitute five villages Gandikhata, Ahmadpur Chidyapur, Lahadpur, Nawrangabad and Pilli Padao.

Habitation/ Villages – Gaindikhata, Lahadpur, Pilli Padao

- Gram Panchayat – Gandikhata
- Block / Urban body - Bahadrabad
- District - Haridwar
- State /UT - Uttrakhand

Two member of UBA team visited this cluster for a week 3rd July to 9th July 2019. Main purpose of this visit was to demonstrate TEG cook stove, selection of the farmers for Biogas and lemon grass cultivation. It was very good response by the local community regarding TEG smokeless cook stove. We had brought four TEG cook stove to this cluster made by IITD. We demonstrated this smokeless cook stove at Gandikhata and Nawrangabad after demonstration all these four cook stove has been given to households in Gandikhata and Nawrangabad two each villages. They started to use this stove for cooking from day first it helped us to mobilize villagers about this smokeless cook stove. Day 3rd when an TEG cook stove fan were not working, villagers called to the UBA team member than same day it was resolved by the team UBA members.

Biomass Cook stoves demonstration work

Most of the family in this cluster cook in open fires by burning biomass like wood and animal dung so Unnat Bharat Abhiyan team has decided to demonstrate biomass cook stove in this cluster. We demonstrated four TEG cook stove at Gandikhata and Nawrangabad village after demonstration work all these four TEG cook stoves has been given to local residence. The family who took this cook stove they started to cook food over this TEG cook stove from same day. The details of the family who has been given this cook stove to cook food and show this cook stove to other family of this village to understand the importance of TEG cook stove.

Gallery

Details of the family who has been given TEG cook stove.



1.

**Savita Devi W/o – Mangu Singh
Total members in the family – 07**



**2. Sita Devi W/O – Late Maha Saini
Total members in the family - 05**

Village name – Nawrangabad, Panchayat- Gandikhata



**3. Guddi Devi W/O – Sarop Singh Kalooda
Total members in the family – 05**



**4. Jayboon Nisha W/O – Md. Noora
Total member of the family – 05**

Village + Panchayat – Gandikhata

Strength of this cook stove

The design is such that it can be locally produced in this cluster. Most of the components can be locally fabricated. However, a few components may need to be bought from the open market. In general, TEG cook stove can cook a family of 6 to 8 persons. However, one could cook even for less or more number of persons.

The TEG integrated with stove is successfully running a dc brushless fan and light. The fan is driven within 2-4 minutes of burning wood when the TEG delivers 1W with temperature difference of 30°C. — After 10 minutes, During daytime cooking, the battery is charged to light the Led at night. During cooking at night, the LED can be directly connected to provide lighting.

The cookstove is capable of generating power even when fuel feeding is stopped, with the help of residual heat present in the cookstove. → Battery charging Run a fan, LED light and Mobile charging.

Current progress status

- Demonstration and distribution of four cook stove free of cost by Unnat Bharat Abhiyan by ONGC fund
- Eleven cook stove has provided to beneficiaries in Just Rs. 1000/ per TEG cook stove
- Five cook stove with solar supported panel has been provided to villagers

Financial details of the TEG cook stove

The family who has shown to interest for smokeless TEG cook stoves they have paid Rs. 1000/- for each cook stove.

IITD UBA has provide eleven number of TEG cook stove in this cluster

Financial viabilities of TEG cook stove

Particulars	Contribution	Total cost
Cost of the Cook stove		Rs. 5800/-
Beneficiaries contribution	Rs. 1000/-	
ONGC support	Rs. 4800/-	
Total	5800/-	5800/-

Beneficiaries details who has received TEG cook stove in Subsidies rate

Sl No.	Name of the TEG cook stove beneficiaries	Village	Beneficiaries Contribution	ONGC Contribution	Total
1	Suraj Prasad Saini, S/O- Kailash Chand Mob. No.- 9837144537	Gaindikhata	1000/-	4800/-	5800/-
2	Manjit Singh, W/O- Jasvir Singh Mob. No.- 7617723200	Laldhang	1000/-	4800/-	5800/-
3	Baijanti Devi, W/O- Kumud	Laldhang	1000/-	4800/-	5800/-
4	Manish Mob. No.- 7248692468	Gaindikhata	1000/-	4800/-	5800/-
5	Gurudev Singh S/O- Jasmer Singh Mob. No.- 9758372824	Gaindikhata	1000/-	4800/-	5800/-
6	Punam Negi W/O – Digambar Singh Negi	Laldhang	1000/-	4800/-	5800/-
7	Sharda Devi W/O- Prof. R. Shankar	Pilli Padoo	1000/-	4800/-	5800/-

8	Sudhakar s/o – Santram Singh	Pilli Padao	1000/-	4800/-	5800/-
9	Shamshad Ali	Pilli Padao	1000/-	4800/-	5800/-
10	Pilli Padao high School (Shree Bijendra Negi) Mo No- 9412964347	Pilli Padao	1000/-	4800	5800/-
11	Saraswati Shishu Vidya Mandir Mob. No.- 941217012	Gaindikhata	1000/-	4800	5800/-
		Total	11000/-	52800	63800





Pics of the beneficiaries.



VID-20190904-WA0004.mp4

Beneficiaries Video

N.B.- There are 21 primary stakeholders who are using smokeless cook stove in the cluster. A group has been formed with twelve primary stakeholders who voluntarily make aware to villagers for smokeless kitchen.

Thank – You