SGP The GEF Small Grants Programme

PROMOTE SMOKELESS FUEL

from Waste Biomass to Reduce Carbon Emission for Better Livelihood and to Increase Conservation and Micro-enterprises

Ministry of Environment & Forests (MoEF)

NSTEDB
Ministry of Science & Technology
Government of India

GEF

UNDP India

UNOPS

CEE
Centre for Environment Education

Energy Research Applications (ERA) is a science and technology (S & T) based organization registered under Societies Registration Act, 1860.

ERA came into existence in the year 1995 as a result of efforts put in by scientists and technologists from I.I.T. Kanpur & I.I.T. Delhi with the objective to harness the S & T for masses at large. Our team members have been contributing excellent research and development work and awarded prestigious Hari Om Bhatnagar award, European Community Fellowships, Young Scientist Fellowship, etc. for research, innovation and proven technologies. ERA has received international recognition in the field of energy research and its applications.

Two patented technologies are in the credit of ERA in collaboration with Department of Science & Technology (DST), Govt. of India.

ERA has been instrumental in working closely with the women groups to reduce drudgery and check the release of Green House Gases (GHG) and in reinforcing its commitment of energy conservation in traditional inefficient systems and technologies in the cottage industries and households.

Geographical area
H.P., Uttarakhand, M. P., Chattisgarh, Orissa, Rajasthan, Tamil Nadu, A. P., Kerala, Assam, Haryana, Jharkhand, West Bengal.

No of Beneficiaries
12 Partners in Country-10,000 HHs.

SGP Grant
Rs. 17,95,000

Co Financing (DST, Govt. of India)
Rs. 17,95,000

Co Financing (NGO/ Communities)
Rs.13,00,000

Project Time Period
2009-2011

Project Background :

Despite rapid growth of commercial energy, biomass remains the principal energy source in rural and traditional sectors. In absolute terms, fuel wood and dung cake still retain a major share (61.5% and 15.4% respectively- Census:2001) of the domestic sector.

Energy Cake Technology converts bio-mass (including powdery agro-wastes and excluding cattle dung) into smokeless high temperature (T_{max} > 500°C) energy source for cooking, heating etc. This technology produces fuel at less cost, less cooking time, less drudgery and less infrastructure.

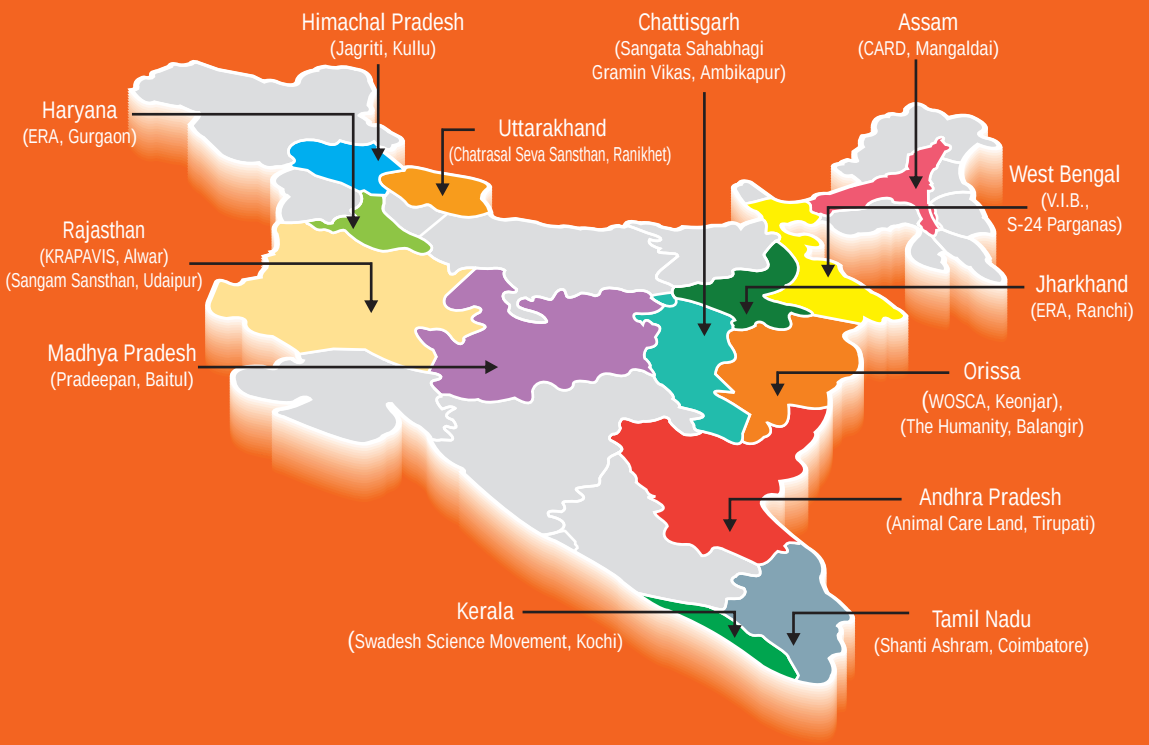
Production of these fuels synchronizes the local resources (all types of agricultural wastes / biomass); need of local low cost renewable smokeless fuel and local opportunity of employment with additional income.

Project Objective :

The aim of this project is to create an alternate sustainable fuel and to build an entrepreneurial and management capacity of rural women groups to own and manage pilot energy enterprise at village levels. The objective is to scale up and replicate this ERA Model of Urja Cake to the GEF UNDP SGP partners in the country and other potential developing countries.

Project Rational :

The project on "Urja Cake" innovated by ERA is not only cost effective, easy to manage and sustainable but easily adaptable to any given remote and inaccessible area. It is envisaged to be up scaled to 12 Small Grant Programme (SGP) and Department of Science & Technology (DST) (Govt. of India) partners from six zones of India by ERA. Country wide network of SGP and testing technology with different biomass from different geographical areas are the two factors to select 12 partners from the country. The partners are :



Project Activities :

Technical Back-up Unit

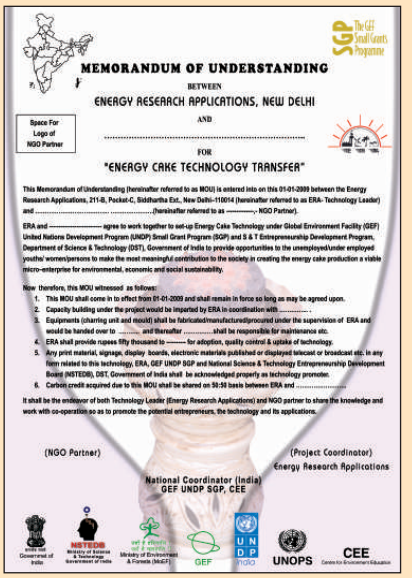
Setting up of Technical Back up Unit for Energy Cake Technology at Gurgaon (Haryana) /Ranchi (Jharkhand).

Building Partnership

- Identify the 12 partners in discussion with SGP team in the respective areas
- Contacts with all SGP partners by ERA for better performance and mutual understanding
- Visit and have discussion on the systems' establishments with each of the identified partners, village communities, self help groups in local areas
- Set up of 12 Urja Cake units with the SHGs in villages with the respective NGOs
- Agree an MOU with each of the partners for training, maintenance, knowledge sharing and carbon credit.

Training of 12 SGP partners

- Partner organizations to identify the trainees in the concerned communities.
- Two training programmes (3 days duration) for each of the partners, one during the installation of the unit and one after 2/3 months of the unit at their door step.
- Regular feedback & monitoring mechanism to be set up with partners.
- Exposure visit of 2 representatives of the communities and 2 of the NGOs to the technology back up unit.



MEMORANDUM OF UNDERSTANDING

BETWEEN

ENERGY RESEARCH APPLICATIONS, NEW DELHI

AND

.....

FOR

"ENERGY CAKE TECHNOLOGY TRANSFER"

This Memorandum of Understanding (hereinafter referred to as MOU) is entered into on this 01-01-2009 between the Energy Research Applications, 211-B, Pocket-C, Siddhartha Ext., New Delhi–110014 (hereinafter referred to as ERA- Technology Leader) and .....(hereinafter referred to as ----------, NGO Partner).

ERA and ---------- agree to work together to set-up Energy Cake Technology under Global Environment Facility (GEF) United Nations Development Program (UNDP) Small Grant Program (SGP) and S & T Entrepreneurship Development Program, Department of Science & Technology (DST), Government of India to provide opportunities to the unemployed/under employed youths/ women/persons to make the most meaningful contribution to the society in creating the energy cake production a viable micro-enterprise for environmental, economic and social sustainability.

Now therefore, this MOU witnessed as follows:

1. This MOU shall come in to effect from 01-01-2009 and shall remain in force so long as may be agreed upon.
2. Capacity building under the project would be imparted by ERA in coordination with ----------.
3. Equipments (charring unit and mould) shall be fabricated/manufactured/procured under the supervision of ERA and would be handed over to ..... and thereafter ..... shall be responsible for maintenance etc.
4. ERA shall provide rupees fifty thousand to ---------- for adoption, quality control & uptake of technology.
5. Any print material, signage, display boards, electronic materials published or displayed telecast or broadcast etc. in any form related to this technology, ERA, GEF UNDP SGP and National Science & Technology Entrepreneurship Development Board (NSTEDB), DST, Government of India shall be acknowledged properly as technology promoter.
6. Carbon credit acquired due to this MOU shall be shared on 50:50 basis between ERA and .....

It shall be the endeavor of both Technology Leader (Energy Research Applications) and NGO partner to share the knowledge and work with co-operation so as to promote the potential entrepreneurs, the technology and its applications.

(NGO Partner)

(Project Coordinator)
Energy Research Applications

National Coordinator (India)
GEF UNDP SGP, CEE

Space For Logo of NGO Partner

Knowledge Management of Technology

- 4 workshops to be held in diffrent region for wider application of technology with other SGP and related partners. Practical demonstration, use of technology, marketing and technical details of Urja Cake will be the hallmark of the workshops.

Urja Cake Technology :

The technology has four stages of production namely :

Preparation of agro-waste char :
The charring unit is a drum (20 litre capacity) with a conical grate with fixed chimney, a telescopic removable chimney and top cover with water seal arrangement. It can be used for almost all local agro-waste materials, even powdery like bumda (Bajra wastes). In this unit, depending upon type of material, about 40 – 100 kg can be carbonised to give 30 – 35% yield of charred material over a period of 2 – 3 hours.

Mixing of Moist char with clay :
About 20% clay is mixed with agro-waste char.
Clay acts as a binder and energy extender.

Production of cake from the agro-waste char :
The mixture having sufficient moisture is put into the mould. The mould has three parts : (a) bottom plate with protruding rods, (b) cylinder to fit bottom plate and (c) a perforated plate. The char cakes thus made are then sun dried and subsequently used in locally available ordinary and simple chulha.

Use of clean char cakes :
The char cake thus made out of wastes is easily ignitable. This is gently placed on the grate. Dry leaves etc. are placed below the grate and ignited. In about 3 to 4 minutes the flames from the combusting leaves ignite the bottom end of the cake. After a short while the flame starts coming up through the holes. The heat thus generated can be used according to one's requirement. When the char cake is about to be burnt out, a second one can be placed over the first one in such a manner that the holes in both the cakes match each other.

Note : 1-6 Signify the sequence of Urja Cake production to its use.

Project Strategy :

The project has two-fold strategy:

Live demonstrations of clean fuels by establishing 12 Units with GEF UNDP SGP partners: The production centers will give live demonstration of technology. This technology primarily caters to rural population as it is based on local wastes. It is simple in operation and capable of producing quality low cost fuel.

Capacity building of the local NGO and communities for production, management and monitoring of units: This will ensure ownership and enable women to be beneficiaries by using the Urja (Energy) Cakes and be managers of the enterprises. This technology will also be proliferated through the wide network of civil society by Centre for Environment Education (CEE) in collaboration with Energy Research Applications (ERA).

Potential Impact :

This project envisages a win-win situation for all stakeholders in three ways namely

- environmental sustainability: reducing cooking load on coal, fuel wood and dung cake, preserving natural resources and minimizing pollution;
- economic sustainability: low cost, energy efficiency, easy to manage and adopt in local conditions;
- social sustainability: poverty alleviation, women empowerment and reduction in smoke and drudgery of fuel wood collection for women for better health and living conditions.

Salient Feature :

Calorific Values of Char	:	3000 to 6000 Kcal/Kg
Duration of Urja Cake's Burning	:	2 to 4 hrs
Temperature (T_{max} with 19 holes)	:	500°C
Temperature (T_{max} with 37 holes)	:	600°C
Storage area for 1825 cakes (@ 5 cakes/d x 365d)	:	10x6x2.5 cu.f.

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