

## PROMOTION OF SMOKE FREE VILLAGES IN CHITTOOR DISTRICT ANDHRAPRADESH STATE, INDIA

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### ABSTRACT

India is a land of villages. Rural people in India largely depend upon fuel wood, crop residues and cow dung cakes to meet their basic energy needs for cooking and heating purposes. With the increasing population pressure of around a billion people, the consumption of fuel wood has far exceeded its sustainable supply, causing deforestation and desertification. The age old practice of burning cattle dung and crop residues for cooking is similarly destructive. Inefficient burns of cow dung in traditional stoves create a lot of smoke in small village huts without effective ventilation causing health problems for many rural women and children.

To mitigate these problems the Indian Union Government has launched many non-conventional energy programmes such as biogas programme, solar cookers etc. With biogas technology we can recycle cow dung to harness its value without destroying the value of the manure. Solar cooking has been envisaged as a solution to mitigate the problem of fossil fuels.

We will discuss the various measures taken by us in promotion of smoke free villages in my area of operation (District). With the support of our District Collector and Mr.Deepak Gadhia of Eco-Center ICNEER, so far we have developed 2 smoke free villages in Chittoor District, first of their kind in India, and the process is going on to promote the 3<sup>rd</sup> village in the District.

We are striving hard in dissemination of the novel concept “smoke free villages” in our District which helps largely in reduction of emission of green house gasses.

Global Treaty Kyoto Protocol's CDM (Clean Development Mechanism) can result in a win-win situation for both developing and developed nations and the world environment at large - whereby developed countries finance sustainable projects in developing nations.

North-South dialogue and South-South dialogue can effectively foster global co-operation meaningfully, to benefit people and environment ensuring sustainable development and protection of our Planet Earth, our only HOME.

**Key Words:** Sharing experience, establishing Smoke Free village, CDM

### 1. INTRODUCTION

Non-Conventional Energy Development Corporation of Andhra Pradesh (NEDCAP) is the Nodal Agency for implementing renewable energy programmes in the Andhra Pradesh State. NEDCAP is pioneering in promoting and implementing all renewable energy programmes under one roof.

The Chittoor District unit of NEDCAP has been implementing comprehensive programmes during the past quarter century, for the development and utilization of various renewable energy sources in the District. These include biogas plants and solar cooking.

So far in the District 20,000 biogas plants and 200 K-14 solar cookers have been installed, and it is a State record.

We developed the novel idea of promoting smoke-free villages which reduces green house gasses emission. To date, we have converted two villages to smoke-free, and similar work is going on in the third village.

This paper attempts to outline how the smoke-free village concept evolved, some case studies documenting its success to date and the vision as to where the use of the smoke-free village concept could lead.

## **2. BACK GROUND.**

India being a vast country with a population of nearly one billion, consumes its significant share of energy for cooking. The sources available for cooking are firewood, crop residues and animal dung in rural areas and LPG, kerosene, oil and coal in urban and semi-urban areas. The smoke emitted from these fuels pollutes the environment and the kitchens, and also affects the health of family members, especially the rural women. Biogas and solar cooking have been envisaged as solution to mitigate these problems.

Biogas generation is the process of extraction of methane gas from waste (dung), water hyacinth, poultry litter etc. This is mild gas which is mostly useful for cooking purposes. This gas has dual advantages for farming communities as it provides biogas for cooking and fertilizer which is highly nitrogenous. Each biogas plant saves 2 tons of fuel wood / 174kgs of LPG / 300 liters of kerosene per annum.

The programme has been launched in Chittoor District during 1982-83. So far 20,000 biogas plants were constructed in the District against an estimated potential of 0.32 millions of biogas plants. We created a lot of awareness among farming communities in the district regarding usage of biogas technology.

Cooking is a common application of solar energy in India. A variety of solar cookers are available to suit different requirements. NEDCAP has been implementing a programme for promoting the use of solar cooking in the state for over two decades.

We developed a new idea in promotion of smoke free villages by utilising the technology of biogas as well as the SK-14 Parabolic solar cooker, developed by Dr. Dieter Seifert of Germany. We have availed of financial and technological assistance from Mr.Deepak Gadhia, Gadhia Solar Energy Systems Pvt Ltd, Valsad in procurement and promotion of these SK-14 Solar cookers.

## **3. THIS PROJECT**

We selected small villages on the periphery of forests in the District, where some family-size biogas plants already existed. We motivated the farmers who have cattle and do not have biogas plants to go for biogas with the government's financial assistance. For the remaining beneficiaries who do not have cattle population we are providing SK-14 Solar cookers with meagre beneficiary contribution.

First we selected one tiny village called Bysanivaripalli in Kurabalakota Mandal of Chittoor District, Andhra Pradesh, India. Thirty-six families inhabit the village and their main activity is farming. The village used to generate 500 tonnes of cow dung and 50 tonnes of sericulture waste, both organic material. We motivated 23 families who have cattle and constructed 23 biogas plants. In the 1<sup>st</sup> phase we provided thirteen SK-14 solar cookers to the families who do not have cattle, with government subsidy and financial assistance from INTERSOL, an Austrian nongovernmental organization (NGO), through their Indian partners Eco-Center ICNEER Valsad.

In the 2nd phase 13 more cookers were supplied. Now in this village 23 biogas plants and 26 SK-14 Solar cookers are functioning. Neither bio-fuel nor fossil fuel is used for cooking and heating in this smoke free village, the first of its kind in India.

With these 23 biogas plants and 26 solar cookers we can have following annual savings;

i. Reduction of CO2 emission	104000 Kgs
ii. Saving of fire wood	72000 Kgs
iii. Saving of LPG	5832 Kgs
iv. Generation of organic manure	550000 kgs

Subsequently, we identified another forest-fringe, tiny village called Singamanuburubu of Thamballapalle Mandal, Chittoor District, with 38 families, mainly in agriculture and milch animal farming. In this village we have constructed 26 biogas plants for families who have cattle population. We have supplied 13 SK14 solar cookers to the families who do not have cattle. One cooker has been supplied to the village school for preparation of mid-day meal for the school children. On seeing the performance of the biogas plants and solar cookers the District collector declared this village as the second smoke free village in the District. Mr. Peter Machart and Miss.Andrea representatives of PLAGUE (Platform against nuclear dangers) Austria visited this village in February 2006.

The financial mechanism is

1) Total cost of the project :	€ 4420
2) Beneficiary contribution :	€ 981
3) Government of India contribution :	€ 1914
4) Forest Departments contribution :	€ 1525

With these 26 biogas plants and 13 solar cookers we can have following annual savings:

i. Reduction of CO <sub>2</sub> emission	100,000 Kgs
ii. Saving in terms of fire wood	70,000 Kgs
iii. Saving in terms of LPG	6,000 Kgs
iv. Generation of organic manure	500,000 kgs

On seeing the success at these first two smoke free villages the District Collector convened a meeting with all the District Officials and advised them to explore the possibilities for identification and financial support for promotion of further smoke free villages in the District.

In this sequence we identified Gopalapuram Village in Chandragiri Mandal of Chittoor District.

In this village 45 tribal families are living and they do not have cattle. To make this village smoke-free we have proposed to supply 45 SK14 solar cookers to the all families in the village. The District Collector advised us to complete the project within 30 days and the work is in process. The financial break out is as follows :

Total cost of 45 SK-14 Solar cookers	€ 5727
Beneficiary's contribution	€ 614

Amount sanctioned by District Collector	€1636
Financial assistance from INTERSOL, through Eco Centre, ICNEER, Valsad	€ 1227
Grant from Forest Department	€ 2250

Expected annual savings from these 45 solar cookers

i.Reduction of CO <sub>2</sub> emission	130,000 kgs
ii.Saving in terms of fire wood	90,000 kgs
ii.Saving in terms of LPG	7,290 kgs

#### 4. POSSIBILITY OF CDM FOR PROMOTION AND CREATION OF MORE SUCH SMOKELESS VILLAGES

We understand from Dr Dieter Seifert that he has submitted a project for Indonesia and look forward to its outcome.

Mr Deepak Gadhia is also working on a mechanism where carbon credits of such projects can be sold to companies that would like to have a green image and instead of going for CERs (Certified Emission Reductions) he proposes to go for VERs (Verified

Emission Reduction). In co-operation with Ms Factor AG of Switzerland he has already succeeded in getting a revolving fund created by selling VERS of his Solar Steam Cooking Systems projects by bundling them, and 20 % of the sale price went to sellers of VERS whereas 80 % comes to the revolving fund to create more smoke-less villages.

#### 5. CONCLUSION

We would like to share our success in promotion of smoke-free villages in Chittoor District and on how the Global Treaty Kyoto Protocol CDM can result in a win-win situation for the world environment at large - whereby developed nations get carbon credits by supporting renewable energy projects in developing nations.