

# Empowering Rural Women In The Field of Biomass Technology Towards Uplifting Economic Status in India

A. Vinay Chandra, K. Narender Reddy

*Abstract: Women empowerment acts like a leader, mentor, guide, teacher and motivator. From 20<sup>th</sup> century the women entrepreneur breaks down the barriers and overcome this paradox. The international center for research on women (ICRW) has studied the ways in which the improved economic status of women positively affects children families and societies. Today 1.1 billion people globally lack access to electricity and 2.9 billion use solid biomass for cooking and heating, other resources energies like water saving, irrigation i.e. drip irrigation. In the technology of bio-mass the entrepreneur should investigate towards flour mill, harvesting operators and irrigation techniques. Based on current trends it will take until 2080 to achieve universal access to electricity and 22<sup>nd</sup> century for access to non polluting energy for domestic process. In Telangana regions there is a stressed owing to farm yields and unpredictable rains, due to total family income constraints its pathetic and family are stressed unduly. The Rural Women Technology Park (RWTP) has been conceptualized and is being implemented in rural Telangana as a means of introducing Technological interventions. This paper inculcates the mobile gasified based energy services in rural women community of Warangal District, Telangana State towards the awareness program and case analysis conducted in the Mandal of Parkal by taking selected clusters of villages.*

**Keywords:** Telangana State, Biomass energy services, Empowerment, Awareness programs.

## I. INTRODUCTION

Technology accessing plays a major role in gender inequality where women constitute the majority of the agricultural workforce in developing countries. Women & girls exposed to great discrimination which enlightened economic education, health and social services worldwide. The urban-rural disparity divided on the basis of economic & social positions to understand the information needs the rural educated middle class women are more prone to change. Government must design & implement national policies and programmes to promote science & technology education for women & girls. Women entrepreneurs have enormous potentiality for lowering customer & servicing costs which decentralize areas and added towards risks.

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For rapid increase in renewable energy technology which creates new business models to accelerate universal sustainable energy access. Biomass has always been an important energy source for the country considering the benefits and promises it offers. It is a carbon neutral fuel source for the generation of electricity; and apart from providing the much needed relief from power shortages, biomass power projects could generate employment in rural areas.

Unlike solar and wind, biomass is relatively a much reliable source of renewable energy free of fluctuation and does not need storage as is the case with solar. But it is not the preferred renewable energy source till now, mainly due to the challenges involved in ensuring reliable biomass supply chain. This is because of the wide range in its physical properties and fluctuation in availability round the year depending on cropping patterns. Biomass from agriculture is available only for a short period after its harvesting, which can stretch only for 2-3 months in a year. So there is a need to have robust institutional and market mechanism for efficient procurement of the required quantity of biomass, within this stipulated short time, and safe storage till it is finally used.

The proposed project is to uplift the women community and turn them into entrepreneurs in the Society. The project mainly aims at creating a better environment for the women to utilize their ideal time for their economical growth. We aimed at rural areas in Warangal District of Andhra Pradesh (now Telangana State) where agriculture is the predominant occupation.

## II. OBJECTIVES OF THE STUDY

1. To design and demonstrate a delivery mechanism, to ensure wide scale adoption of water and energy efficient technologies as well as enterprise model.
2. Training on operation and management of biomass Gasifier, local resource management.
3. Sensitization of the rural women communities of the project area on the use of biomass Gasifier based energy system and implement it in microenterprises for affordable energy.
4. To build necessary knowledge and skill sets among rural women to incubate agri-support services to enhance financial returns.

**III. AREA OF THE PROJECT**

For executing this project we have selected a cluster of villages in Parkal Mandal of Warangal District, Andhra Pradesh (now Telangana State). Warangal District has an area of 12,846 km<sup>2</sup>, North-18°12'0", East-79°43'0" and a population of 3,512,576 out of which the male population is around 1766257 and the Female population is 1756387 approximately.

In 2006 the Indian government named Warangal as one of the country's 250 most backward Districts (out of a total of 640). It was one of the thirteen districts in Andhra Pradesh received funds from the Backward Regions Grant Fund Program (BRGF). As per provisional data of 2011 census, Parkal urban agglomeration had a population of 103,962, out of which males were 51,819 and females were 52,143. The literacy rate was 78.69 per cent.

As we erect this project in the geographical area of parakal mandal, Warangal district, Andhra Pradesh, we mainly aim at the people from four major villages of parkal such as Nadikuda, Vellamapalle, Raiparthy, Nagaram. The overall population of these villages of as from 2011 census are as: Men – 6837, Women – 6959, Total - 13796

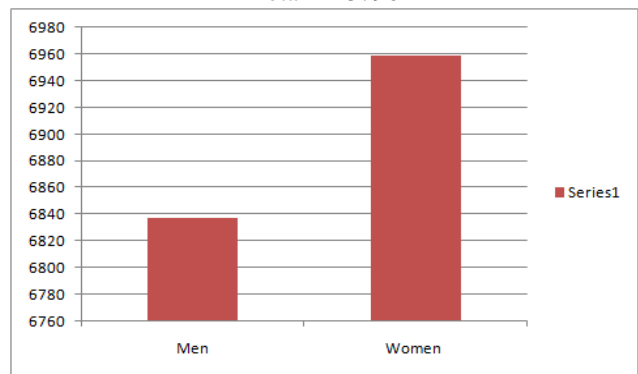
Out of these populations, 68% of people earn their income through various farming activities. So, we can strongly say that at least 50% of above mentioned population gets benefitted from this project outcome. With low industrialization and low urbanization agriculture is the predominant occupation. Farmers and entrepreneurs are bound to use diesel due to non availability of power which is not only siphoning out their hard earned money but also lower down their profitability due to high diesel prices. To improvise these situations we have envisaged that a Mobile Gasifier based energy technology package can overcome these techno commercial and agro-climatic limitations. Women from each village from various castes and occupations who have enough free time to contribute for satisfactory running of the project are selected. From this selected group of women, we have identified skilled people who can do work better and trained them for our requirement to act as head for biomass collection groups.



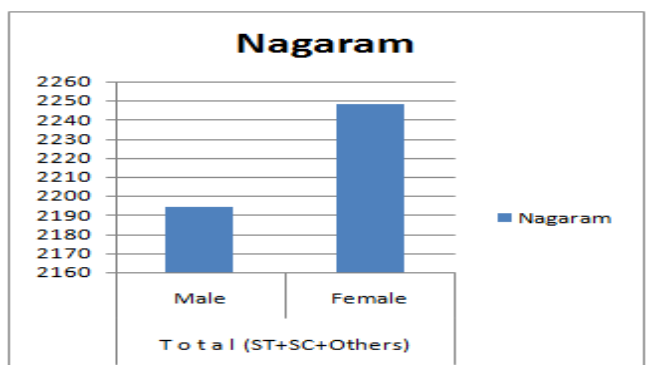
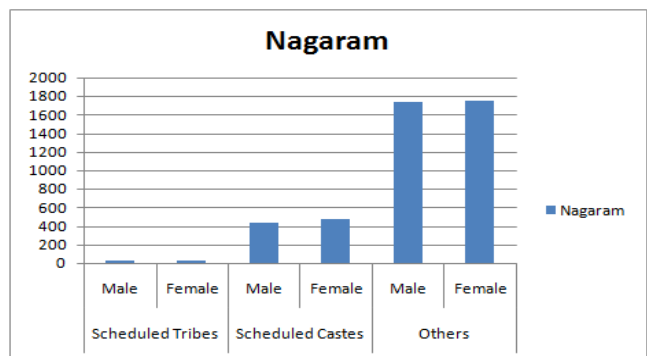
The communities selected for the project comprises of low-income communities and vulnerable groups belonging to Backward Caste, Scheduled Caste & Scheduled Tribe. Women are involved in almost all the livelihood activities of Warangal district including the traditional ones like habitat works, agro-based activities etc.

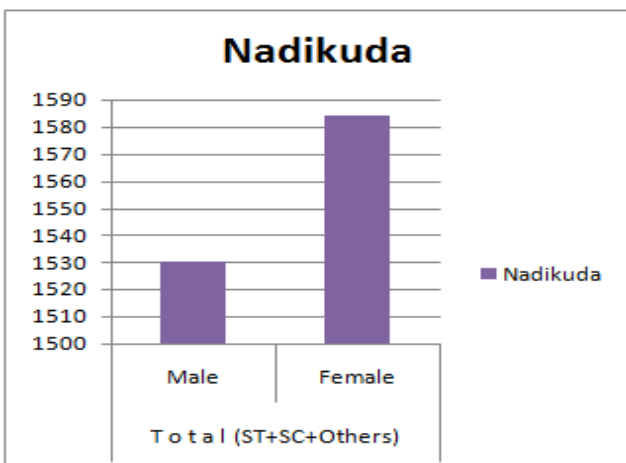
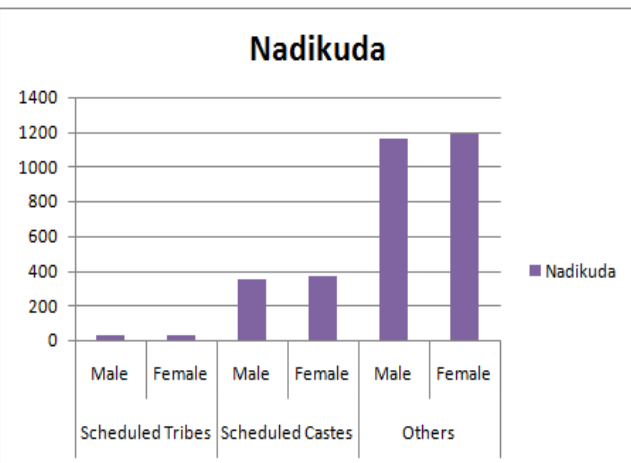
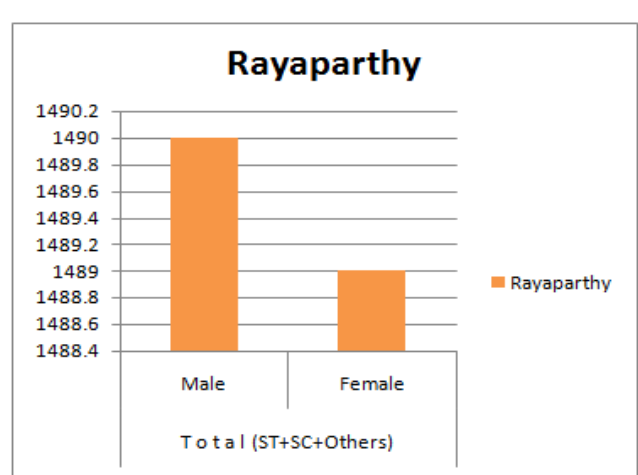
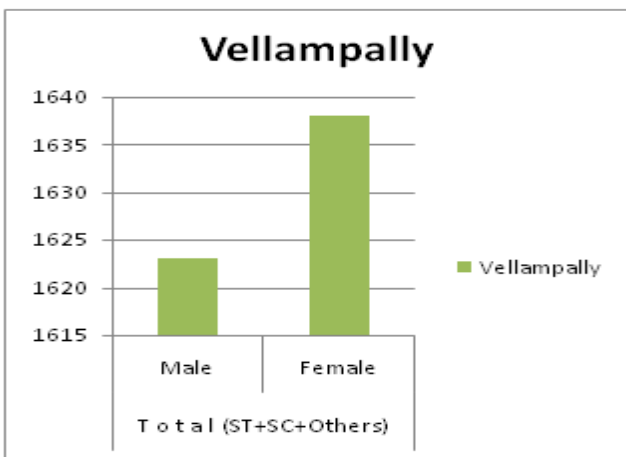
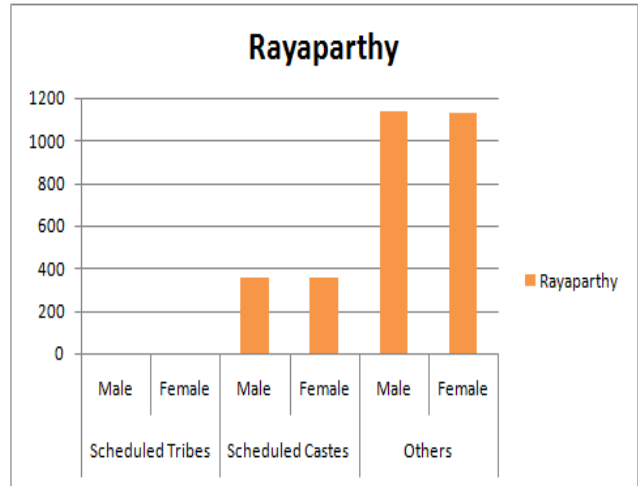
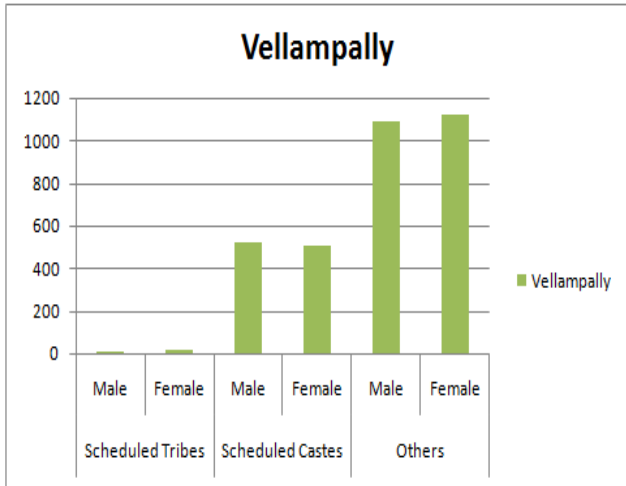
Social enterprise groups in Parkal Mandal (Nadikuda, Vellamapalle, Raiparthy, Nagaram villages) are active members for running the plants effectively. They are the main target groups who directly get benefitted from this project. The farmers or customers of above mentioned villages who are in need of energy will also get benefitted with such renewable non-polluting energy. As from 2011 census the population of above mentioned villages are as

Men– 6837  
Women – 6959  
Total – 13796



From the above chart it is been observed that, 68% of people earn their income through various farming activities. So, we can strongly say that atleast 50% of above mentioned population gets benefitted from this project outcome.





#### IV. METHODOLOGY AND WORK PLAN

This project is to uplift the women community and turn them into entrepreneurs in the Society. The project mainly aims at creating a better environment for the women to utilize their ideal time for their growth. We aimed at rural areas in Warangal district of Andhra Pradesh (now Telangana State) where agriculture is the predominant occupation. Farmers and entrepreneurs are bound to use diesel due to non availability of power which is not only siphoning out their hard earned money but also lower their profitability due to high diesel prices. To improve these situations we have envisaged that a Mobile Gasifier based energy technology package can overcome these techno commercial and agro-climatic limitations.

This project will adopt 'apply and learn' approach and will follow a three stage implementation strategy. Namely:

- Design and stakeholder's engagement phase
- Technology set-up and capacity building phase
- Operation and evaluation phase.

##### A. Design and Stakeholder's Engagement Phase

- Project had identified 8-10 potential operators from across 4-5 villages those who had basic understanding of diesel engine/pump/electrical implements. Technical and basic accounting training had provided to them to enhance their decision making capacity.





- The benefits from biomass business had been shared among villages. Since biomass was the key input for such business and it requires very little knowledge and skill sets, this was handled by the rural household women. This was not only creating livelihood opportunity for them but also give them a social position for their critical role in the entire process.
- Although the team had conducted basic survey through Rapid Rural Assessment (RRA) technique but a detailed energy as well as biomass survey had conducted in the target villages where a group of 4-5 villages had formed as a cluster to understand the access and control issues. This information had helped the team and all potential entrepreneurs to design and develop a suitable supply chain and business model.

### B. Technology set-up and Capacity Building Phase

- Two units of mobile biomass gasifier (10KW) had procured from the sole supplier in the interval of 5-6 months. Based on the first gasifier modifications might be sought out for the second gasifier. Project was also purchased pumps and fabricate biomass cutter to develop the complete technology package as proposed.
- The identified operators had trained at SR Engineering College Resource Center on various operation and maintenance issues. Trainees were also run the gasifier with various ip /op conditions so as to reinforce their skill sets. SR Engineering College also trained them on load management issues.
- The project team had facilitate the process and assist the potential entrepreneurs particularly rural women to ensure necessary resources and to manage the demand. During this normal course of operation and service delivery project had collected field data.
- Using collected and collated data the project team with the help of financial experts had developed draft business plan and shared the experience with various financial institutes to secure their buy in the proposed business model.



**Fig. Instructing the enterprise groups regarding the specifications of raw material to be collected from the post harvesting materials**

### C. Operation and Evaluation Phase

- Potential Social Entrepreneurs (SE), primary beneficiary group, particularly from women population had identified and trained on several operational issues. Exposure visits on job training methods were used to build up their capacity. They got trained on several aspects of business. A detailed MOU had signed with each of these groups to fix their roles and responsibilities.
- Once all primary stakeholders were trained, the proposed energy service delivery model had demonstrated among all target communities. Social communication process had carried out to secure their demand and active involvement.
- A parallel sensitization activity was also be carried away to involve facilitating stakeholders such as financial institutes, potential investors, forest dept. executives, irrigation dept executives as well as local NGOs those who played an important role to popularize this model.
- Based on hands on operation / business experience, project team had develop necessary knowledge products such as operation manual, training manual, rural Power Purchase Agreements (PPA) etc. Such knowledge products were not only helped us to disseminate project learning with funding agencies or investors group but will also help the primary and secondary stakeholders while adopting the proposed social enterprise model.
- The project, towards end of the project will recollect data from the intervening villages as well as non-intervening villages to measure the short time impact of the proposed energy service delivery model by comparing the collected information with baseline information. Three to four case studies will be developed based on this exercise and the same will be published among various social development networks.
- Project will incorporate suggestions and comments to develop bankable business plan to facilitate the commercial adoption of the model.





**Discussion with Rice mill owners for providing raw material for project and power ratings required for them to run the mill for purchasing power from the project plant.**

In the design and stakeholder’s engagement phase the project will follow the participatory approaches like focus group discussion, meeting, sensitizing to local community on the benefits of Gasifier based power and energy and water saving irrigation technology like drip irrigation. A detail energy assessment process will also be conducted to know the different energy needs and what are the potential uses that can be set in the targeted villages.

The villagers will also be engaged to assess the biomass assessment process and few farmers will be initially identified to demonstrate the biomass Gasifier following the consultation meeting with the villagers.

In the technology set-up and capacity building phase, the project will sought out help to the villagers to identify the potential entrepreneurs on biomass, flour mill, harvesting, operators, irrigation technicians etc.

In operation and evaluation phase, the project will follow a monthly or a bi-monthly consultation to track the project progress whether or not it is running towards achieving its objectives. Their feedback will also be incorporated in the business plan to make it more efficient and convenient for the target communities.

**D. People’s Participation:**

In the execution of this project we have followed a comprehensive approach to incorporate all people in the target villages and thus the outreach effect will be created in the following ways

- All people of the target villages are sensitized on renewable energy and the benefits from it for the people themselves.
- Financial institutes can be sensitized on funding to the social enterprises and social enterprises will be acquainted to the financial institutes.
- Rural women will learn how biomass can contribute to their local development and will actively involved in business management and thus empowerment will emerge in the locality.



A selected group of women are set as social enterprise groups are in the selected villages of Parkal mandal.

(such as Nadikuda, Vellamapalle, Raiparthy, Nagaram villages) who act as active members for running the plants effectively. They are the main target groups who directly get benefitted from this project. The farmers of the above mentioned villages are the major contributors for the raw material for this project. Farmers who are in need of energy will also get benefitted with such renewable non-polluting energy.

### V. HIGHLIGHTS OF THE STUDY

- Awareness programs were initiated at all the selected villages of Parkal Mandal with all the available farmers, women and local representatives for 6days.
- After initial awareness given, some groups were formed with selected women from all the villages to further educate on the project.
- An overall meeting was held in head quarters of Parkal Mandal with all the groups and local representatives.
- Once the groups were given with project idea, project execution was started.
- Further, training was organized at the project area at the time of execution of the plant. And they were provided with all the details of production forecasting and efficiency once over all evaluation was done.

### VI. CONCLUSION

Women economic empowerment programme, UN women has designed “Women Power TM” an integrated cloud based platform that links women entrepreneurs with information to all the channels of distribution between contributing partners which able to view key performance indicators networking is a fairly new process and needs the sensitization and belief in the technology which is a factor of time to adopt for willingness. Rural women will learn how biomass can contribute to their local development and will actively involved in business management and thus empowerment will emerge in locality.

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