



HEALTH HAZARDS ASSOCIATED WITH CONVENTIONAL DOMESTIC FUEL AND ROLE OF BIOGAS TECHNOLOGY AS SAFE FUEL FOR WOMEN

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Abstract:

In the rural areas of India, women have traditionally shouldered the responsibility of managing domestic energy requirements for their families. Thus they have an intrinsic and symbiotic relationship with the surrounding natural resource system. Cooking fuels are derived predominantly from biomass resources like wood, crop residues, and animal dung. Fuel wood collection is carried out by women. Alternative energy technology such as micro hydro plants, biogas plants, solar cooker have a high potential to reduce women's workloads and improve their health status, as well as increasing efficient energy supply in rural areas. Biogas is a clean and convenient fuel for cooking and lighting in the household, it can supply power for irrigation and small industries, and the effluent slurry a by product can be used as an organic manure.

Keywords: energy, biogas technology, cooking fuels, women's workload.

Introduction:

Women in the villages work every minute during their working hours. Census figures can not reflect the stark reality of their hard routine life which start early in the morning fetching water from long distance, cooking, cleaning, washing, feeding children and then rushing off to work for 6-8 hours on a breaking job such as transplanting as wage labour. On their return the fire must be lit again if they have collected firewood, food must be cooked and the day's cleaning, washing must be completed.

While considering potential health risks to women at home, field and in hazardous occupations must be taken into account. Physical factor such as posture while working, mechanical strain, longer working hours, climatic extremes and toxicity conditions, on women who are generally prone to





suffering from malnutrition, anemia, general ill health and maternity stress should also be considered.

Rural women are the major biomass gatherers, be it for fuel or feed. The time and energy that they spend for fuel collection has increased manifold in the last decade or so. The long distances women have to trudge to collect basic necessities like fuel, fodder, water etc. Each year the distance is increasing because of the fast depleting forests, commercialisation of agriculture, excessive use of surface and ground water by agriculture and industry.

Health hazards associated with conventional domestic fuel:

The role of women in rural life towards their input to labour in their own farm and occupation or employment outside their homes, changes according to social and economic status of the family. The rural women bear the burnt of drudgery more than others.

1. Walking long distance to fetch water and drawing water from deep wells.
2. Collecting fuel for major part of the day. Fuel gathering is also an important domestic activity where women are engaged in these activities.
3. Cooking in smoke full environment. Consumption of more fuel and loss of heat due to faulty stove (chulla) traditional utensils and time consuming cooking process.
4. Women also face many hazards in kitchen and home. These range from cuts, burns and catching of fire (Srivastava J.C 1984).

Women in India who cook food by burning biomass fuels like wood or cow dung expose themselves to high levels of pollutants, including a deadly chemical, benzopyrene which is suspected to cause cancer. According to Dr. Smith who conducted a study of 36 rural households in India said that some levels of benzopyrene were found to be so high that one would have to smoke as many as 20 packets of cigarette's a day receive that concentration (Smith – 1991)

Dr. Smith informed that the indoor air pollution caused due to the household cooking fuel emission is the main cause of the acute respiratory





diseases and chronic obstructive lung diseases. Effect of the cooking fuel emission fuels are the main source in increasing the national burden of diseases.

The diseases are caused due to regular release of carbon monoxide (CO) and carbon-di-oxide (CO₂) and other toxic fumes in a small house are hutment with absolutely no ventilation. Burning of biomass fuel contributes to Indoor air pollution leading to domestic health hazards, particularly affecting women. Biomass on combustion emits pollutants, such as respirable particular matter, carbon monoxide, nitrogen oxides and methane and non methane organic compounds.

In comparison of fossil fuels, the emission of pollution from wood combustion is higher. Incomplete combustion of bio-fuels produces smoke which can cause a number of health problems such as conjunctivitis, acute respiratory infections, upper respiratory tract irritation etc. Continuous inhalation of smoke could lead to chronic bronchitis and even cancer of the lung. Continuous exposure of fire could also cause burns and cataract.

Role of biogas technology as safe fuel for women:

Application of appropriate technology for the improvement of the life and status of women will depend upon the development of simple, low cost eco friendly, easy to be adopted technology aimed at drudgery reduction improvement in health condition, increase in productivity, opening of new avenues of income generation etc.

Shifting to biogas technology can lead to a reduced incidence of many respiratory illnesses through removal of smoke in the kitchen. In the evaluation study of TERI (Tata energy Research Institute) the women felt that the use of biogas has led to a reduction in the smoke level and contributed towards cleaner and more comfortable kitchens. The women also said that earlier, sitting in a crouching position in front of a chulha was very difficult with persistent watering of eyes and irritation of throat.

Use of biogas has considerably reduced smoke. The vessels and kitchen walls do not blacken. A women reported that before using biogas, She had to plaster kitchen walls every two months. This has reduced to once in four months thereby reducing expenditure. (TERI Report-1997)





Advantages of Biogas: Environmental and Health aspects:

1. Elimination of smoke reduces the incidence of lung and eye diseases, especially among village women.
2. Improved rural sanitation due to systematic collection and processing to animal dung and human excreta.
3. This also leads to reduction of water borne diseases caused by lack of sewers and sanitation.
4. Aids to prevent deforestation and consequently soil erosion, flood and climate effects.
5. Improved rural sanitation due to utilisation of dung and human excreta
6. The fuel burns with a soothers flame, providing for smokeless cooking which does not make the home or the vessels dirty.
7. Cooking with biogas is much faster and more efficient than cooking with traditional fuels such as firewood, thus reducing the drudgery of rural women's live and sparing than time for developmental activities
8. Reducing in the time spent in cooking, finding fuels, chopping woods, collecting weeds and crop stalks or buying coal from distant places results in an overall improvement in the situation of women and children.

Hence the biogas technology is very useful for rural homemakers. It improves the standard of living of village homemakers. The biogas plants had a positive impact on the rural homemaker's life style. It provides leisure time, saved them from the drudgery of making dung cake, collecting and storing of fuel, improved their health, reduced the physical hazards, and increased their social status.

Objectives:

1. To study difficulties faced while fuel collection and effect of smoke on health.
2. To study the impact of technology on rural women.





Methodology:

The present study was conducted in Wardha district of Maharashtra State. The villages were purposely selected from each taluka of the district as there were sufficient number of plants available. In all from 8 talukas 32 villages were selected for in depth study of the problem. For this study a sample of 250 families who had adopted the biogas plants in these talukas were purposely selected

Result & Discussion:

Rural homemakers have to do all household duties. After completing household work they go to fields to work or collect wood, and they spend much more time for collection of fuel. While collecting fuel homemakers face so many difficulties.

It is observed from the table I, lack of fuel is one of the most important problems and they have to walk for a long distance in search of fuel and they have to spend lot of time also. The poor families of the village depend on agro waste such as pigeon pea and cotton stalks. These were freely available to them but now they are gradually diminishing in its supply.

While collecting fuel lot of thorns prick their legs, they have to go in scorching sun and get sun burns and in addition to all these they have a lot of mental tension (Table I).

Rural homemakers use firewood, cow dung cakes and other solid fuel as fuel. These create a lot of smoke, which contains cancer causing chemicals. The same effects the eyes and lungs.

It is reported in the literature that in the cooking process of five member of family a homemaker consumes smoke, which one gets from 21 packets of cigarettes so it is natural that due to smoke women are put into troubles. They have reported number of trouble like irritation of eyes, watering from eyes, continuous cough, difficulty in breathing, chest pain and asthma due to smoke (Table II).

Majority of the respondents 80.4% answered that due to biogas plant the health improves. Because the major problems faced by women at their traditional chulhas were heavy smoke emission and soot deposition on pots, walls and roofs. 58.4% adopters expressed that taste of the food cooked on





biogas in good. 77.2% respondents said that in adoption of biogas plant there was not carbon on utensils thus saved time also freed them from the arduous job of cleaning the utensils (Table III).

If the work is convenient it gives much positive effect in the result. It reduces surplus burden and saves the loss of time and energy which can be channelized for some work. 64.8% homemakers said that biogas as compared to chulha is convenient in cooking.

Conclusion:

The rural homemakers are facing the problem of fuel as firewood is becoming very scarce and the prices are high. To deal with this problem some strategies have been envisaged. Small, family size biogas plant is one of these non conventional sources of alternative energy. It saves time, money and energy of the housewife all the time. It also improves the hygienic conditions and sanitation. Utilisation of biogas technology would have direct impact on rural household particularly it will raise rural women's standard of living.

Table I- Difficulties faced in fuel collection

Sr.No	Difficulties	Adopters N=250	Percentage %
1	Lack of fuel	151	60.4
2	Walking for long distance	141	56.4
3	Thorn Pricking	120	48
4	Mental tension	118	47.2
5	Time consumed to collect fuel	109	43.6

Table II- Effect of smoke on health

Sr.No.	Effect of Smoke on health	Adopters N = 250	Percentage %
1	Irritation of eyes	204	81.6
2	Watering from eyes	183	73.21
3	Continuous cough	140	56
4	Difficulty in Breathing	91	36.4
5	Chest Pain	77	30.8
6	Asthama	50	20





Table III: Perceptions regarding impact of biogas on biogas on health, taste and convenience

Sr. No.	Impact of biogas	Adopters N = 250	Percentage %
1	Health	201	80.4
2	Taste	146	58.4
3	Time saving in cleaning the utensils	193	77.2
4	Convenience	162	64.8

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