Chapter 8
Prospect of Cow Dung as a Source of Renewable Energy in Tripura, India: Viability and Challenges

Dr. Supriya Dam
Netaji Subhash Mahavidyalaya, Udaipur, India

Raghunandan Das
Government Degree College, Dharmanagar, India

Sujit Ranjan Das
Government Degree College, Dharmanagar, India

ABSTRACT

Ever-increasing crude oil prices across the globe coupled with high cost and sustainability concerns attached to hydro power generation led to exploring new avenues for switching to alternate/renewable energy than ever before. The present study sheds light on the prospect of promoting cow dung as an alternative source of energy with respect to tiny mountainous state Tripura and its role on socioeconomic development. Available literature provides the impression that energy from cow dung can be produced from biogas or by burning the dried dung to a power steam engine. The state has been blessed with cow dung across its rural centers, which are primarily used as bio-manures for agriculture and adjoining sectors. Centralized mobilization of these resources for energy generation have already paid rich dividends for states like Tamilnadu, Chattisgarh, Jharkhand, and other parts of India. This study examines the viability and challenges associated with power generation from cow dung for Tripura and presents a case for its adoption.

DOI: 10.4018/978-1-6684-4610-2.ch008

INTRODUCTION

Use of replenishable source of energy got prominence in recent decades due to scarcity of conventional source of power to meet ever increasing demands. Conventional source of energy like hydroelectricity, crude oils, gas turbine etc. are subject to high costs and non-renewable in nature (except hydro power) along with scarcity of storage capacity made it a one shot affair since its inception. Obviously, impending energy crisis in multiple fronts along with green environment considerations calls for carbon neutral efficient source of power (Mahapatra et al, 2014); with a propensity to renew it in accordance with ever-increasing demand. Escalating growth of population across India led to spurt in demand for energy (both as fuel and power) necessitates policy makers' attention to non-exhaustible source of energy than ever before. In this regard, Kumar and Majid (2020) stressed that an opportune economic situation coupled with strong government backing propelled India towards one of the top producers of renewable energy across the world. This in turn calls for a clear delineation between exhaustible and non-exhaustible sources of energy, dominated recent academic discourses, keeping in mind sustainability considerations.

Renewable energy is inexhaustible form of energy primarily obtained from wind power, solar power, geothermal energy, tidal power, hydroelectric power, biogas among others. Conventional non-renewable energy primarily generated from fossil fuel such as coal, oil, gas and nuclear energy likely to deplete with ever increasing consumption. As per estimates, close to 74 per cent of the energy resources are met from costliest coal and oil (as cited in Kumar and Majid, 2020, p1) and recent soaring of oil prices badly impacted the economies of third world countries. Again, amongst the renewable sources of energy, hydroelectric power considered as costliest form of inexhaustible form of energy and likely to have environmental hazards as well. In fact, Hudek et al (2020) amply remonstrates that hydroelectric power plants in protected areas cause severe impact on biodiversity and environment. In addition, greenhouse gas emission from hydroelectric reservoirs posing serious threat to environmental sustainability (Deemer et al, 2016) as well.

Recent literature demonstrate that cow dung has emerged as alternative renewable energy for biogas production for a country like India in which dairy farming widely practiced across the country. Gupta et al (2016) opined that microflora generated from bio-resources like cow dung have the texture to significantly contribute towards sustainable agriculture and energy needs not fully utilized as yet. Kumar et al (2020) argued that number of cattle and family size are integral for biogas production while its improper knowledge and cattle ratio lead to less than proportionate growth of biogas as a source of energy. Conversely, developing productive enterprise from locally available resources for production of sustainable energy will strengthen rural folklore, increasing economic opportunities and much needed employment for skilled workforce (Patnaik et al, 2020) hitherto underutilized segments.

As of now, the state depends on two sources of power generation, namely, hydro and thermal, for meeting the demands of consumers both inside and outside Tripura. Of which, thermal power generated from Baramura Gas Thermal Projects (BGTP) and Rokhia Gas Thermal Projects (RGTP) over and above of Gomti Hydro Electric Projects (GHEP) with combined installed capacity of 152 megawatts (MWs). RGTP has seven operating units followed by GHEP (three operating units) while BGTP (two operating units) in descending order. In addition, Oil and Natural Gas Commission (ONGC) Tripura Power Company's gas turbine project at Palatana (situated at Gomti district) has been catering to needs of people of the state over the years. Of these, thermal power accounts for 77 per cent of the total power generation of the state while the rest are met from hydro power. Obviously, number of powers generating stations, as mentioned above, failed to meet the peak demand consistently over a period of time causing