Introduction

Shortage of energy is a serious constraint to the achievement of sustainable development. Predominant dependance (95%) upon traditional energy sources such as fuelwood, agricultural residue, and animal wastes characterises the energy scenario of Nepal. Among traditional energy sources, fuelwood constitutes 75 per cent while dung and agricultural residue share 11 and 8.5 per cent respectively. Poorly managed forests have to shoulder this immense burden to meet the increasing demand for energy caused by both the rising population and the lack of development of alternative energy resources.

It is ironic that Nepal, endowed with one of the largest hydropower potentials in the world, has so far used less than one per cent of its existing potential. Thus, the search for and production of alternative options to meet energy needs is of paramount importance.

One of the alternative sources of energy for cooking in the rural areas is biogas. Nepalese agriculture is dominated by a mixed farming system in which crop and livestock husbandry are combined. This necessitates that every household maintains a few animals. The livestock population in Nepal is estimated to consist of 3.4 million cows, 3.6 million oxen, and 4.2 million buffaloes. The daily average production of manure is 10kg per animal. Thus, theoretically, the total production of manure is estimated to be 112 million kilogramme per day. This will necessitate the establishment of 1.8 million family-size biogas digesters. Practically, it is difficult to collect all the dung, and, assuming the use of only 60 per cent of the total production of dung, the potential number of biogas digesters required would then be about one million.

The time involved in collecting fuelwood or making dung cakes is enormous, and if farm families are relieved of this operation they could use the spare time for other productive and income-generating activities. To achieve this, it would be necessary to provide fuel for cooking and illumination to each rural household at a cheap rate.

It has been known that, as the dung passes through biogas digesters, the resultant slurry is enriched with nutrients. Thus, theoretically , the slurry would yield a higher quantity of nitrogen, phosphorous, and potash than the actual dung. Unfortunately, because of a shortage of fuelwood in the Nepalese *Terai*, most of the fresh dung is converted into dung cakes for cooking and thus the agricultural land is deprived of traditional farmyard manure.

It is thus seen that biogas technology has enormous potential for meeting the demand of fuel for more than a million households in Nepal. Tangibly, it could replace the use of some petroleum products as well. It will also relieve rural women of the hazardous task of fuelwood burning and of physical hardships caused by several hours of travel each day in search of fuelwood. Biogas technology, therefore, assures wide ranging socioeconomic benefits for the prosperity and the quality of life of rural households. As rural households switch to biogas for cooking, their predominant dependency on fuelwood for cooking will gradually decline and this will certainly ease the burden on the depleting forests. There is also a potential for employment generation during the construction and establishment of these plants and their subsequent maintenance.