

## CHAPTER 13

# ENERGY CONSERVATION MANAGEMENT PLAN

### 13.1 GENERAL

Various construction and other activities of the proposed Dibang Multipurpose Project would lead to increased demand for fuel wood and fodder in the project area and its vicinity and would therefore exert pressure on forest areas located around the project. The major source of energy in the villages of the project area is fuel wood, acquirement of which is one of the main causes of ecological degradation and human drudgery. It is estimated that during the construction of the project, which would last for about 8 years, around 5000 labourers will be working. Majority of the labour force will be outsiders and it will be very important to meet their energy requirement in an ecologically sustainable manner.

To provide an alternate for the energy requirement of the workers, contractor/s will be made responsible to provide subsidized kerosene/LPG to their workers which will in turn discourage them from illegal tree felling and removal of fuel wood and timber from the adjoining forests. Further, community kitchen facilities would also be provided to the labourers by the contractors. In addition to above, efforts would be made towards energy conservation by installing non-conventional energy sources as discussed in the subsequent paragraphs.

### 13.2 ENERGY SAVERS

#### 13.2.1 Distribution of Kerosene oil stoves

Conventional Kerosene oil Stoves is a good substitute for fuel wood and will be distributed amongst the workers and the locals in the nearby villages.

#### 13.2.2 Distribution of Pressure Cookers

The distribution of the pressure cookers may also be taken as one of the attractive option for energy saving. The energy required for food preparation

in pressure cookers is less than conventional cooking in pot, therefore, to save burning of firewood, pressure cookers would be given at subsidized rates to the labourers for cooking needs. It will also help in reducing energy consumption.

### **13.2.3 Solar Cookers**

Solar cookers utilize sunrays, one of the abundant sources of pollution free natural energy. Barring cloudy days in rainy season, it can be used in sunny days to cook and thereby conventional fuels to a significant amount. It, however, supplements the cooking fuel and cannot replace it in total. Solar energy is abundantly available in India. On clear sunny days, it is possible to cook noon meal for 4 to 5 people in a normal **Box solar cooker** and if one desires either full or part evening meal could also be cooked in it. Concentrating Cookers can cook food for large number of people faster than box solar cookers. A **Cardboard Cooker** could be useful for high solar isolation areas with less wind.

#### ***Box type solar cookers***

The box type solar cookers with a single reflecting mirror are the most popular in India. A family size solar cooker is sufficient for 4 to 5 members and saves about 3 to 4 cylinders of LPG every year. The life of this cooker is up to 15 years. This cooker costs around Rs.1000 after allowing for subsidy. Box Solar Cooker is basically an insulated box with a glass cover and a top lid, which has a mirror on the inside to reflect sunlight into the box when the lid is kept open. The inner part of the box is painted black. Up to four black painted vessels are placed inside the box with the food to be cooked. The cooker takes 1½ to 2 hours to cook items such as rice, lentils and vegetables. It is an ideal device for domestic cooking during most of the year except the monsoon season and cloudy days. It, however cannot be used for Solar Cooking involves no recurring expenses on fuel. Solar energy is absolutely free. A box solar cooker if used regularly can save 3 to 4 LPG cylinders per year. It saves time also.

### **Cost & Availability**

Solar cookers are available both with and without electrical back up in different sizes and features. These can be procured from manufacturers /suppliers/district and head offices of state agencies. Cooker with an electrical back up has the advantage of cooking food during non-sunshine hours/cloudy days with very nominal consumption of electricity. The cost of the cooker varies from Rs. 1000 to 2500 depending on its size & features. A normal size family cooker is sufficient for a family of 4 to 5 members. It has a life of 15 to 20 years and pays back the cost in 3 to 4 years. Community box solar cookers are also being manufactured by some of the manufacturers, which can cook food for 20 to 25 people.

#### **13.2.4 Installation of Improved Chullhas**

Improved chulhas are scientifically designed for optimal regulation of heat flow and better fuel utilization. Improved chullhas not only economies fuel wood consumption but also help in keeping the house clean, i.e. free from smoke and also help in preventing eye ailment due to smoke. Provisions may be made to make smokeless chullhas available to the workers and villagers. Varieties of energy efficient chulhas are available such as durable fixed type chullhas with chimney, portable type and High altitude chullhas.

#### **13.2.5 Construction of LPG depots**

To minimize the pressure on the adjoining forests from illegal felling and removal of timber the Project Authority, as a part of the contract, will make it mandatory for the contractors to provide community kitchen facilities to their labourers. The fuel used for cooking in these kitchens shall be LPG. However, there will be a small percentage of labour population who will be employed by small contractors. It will not be possible for these small contractors to run community kitchen for the labour employed by them. It is proposed that NHPC may provide subsidized fuel to the labour population and their families.

### **13.3 COST IMPLICATIONS**

For various energy conservation measures a lump sum provision of Rs. 40 lakhs has been kept.