

and Technology a few years ago. In phase-I of the programme considerable success has achieved in the utilisation of organic waste, primarily animal dung, and a few designs of viable family size bio-gas plants have been evolved. "Janata" drumless plants and ferro-cement gas holders have been developed, and research work on the micro-biological aspects has shown promising results.

A major and dynamic thrust is now being given by the DST to develop family and community-size bio-gas plants as an important element in the rural energy matrix. In the future phase of the programme, which has commenced this year, more emphasis is being placed on expanding the installation of community size bio-gas plants, as well as family type plants and the utilisation of other types of solid wastes/materials, like vegetable wastes and agricultural residues. 6 community size bio-gas plants are under construction and nearing completion, in selected villages by PRAD, Lucknow and KVIC. A short-term programme for demonstration of 14 more community size bio-gas plants has been drawn up and site selection is in progress. In support of the co-ordinated project, work is underway in resolving other technical problems concerning microbiological aspects, fermentation technology, low cost construction techniques and materials, and low cost devices and engines for bio-gas utilisation.

Various programmes are underway to explore the utilisation of agricultural residues or biomass to provide alcohols that can be used as fuel or feed stock; here solar energy is made use of through photosynthesis and the biological chains. DST has constituted a National Steering Committee to examine, identify and formulate R&D Programmes related to production of Biomass and conversion of Biomass to fuels/feedstock, specially keeping in view the abundant sup-

ply of solar energy. Two projects—project on bioconversion of methane to methanol and another project for studying conversion of cellulosic material to ethanol have been taken up at the IIT, Delhi. Also, a project for introduction, screening cultivation of potential petrocrops and their conversion into Petroleum hydrocarbons has been initiated by DST at the National Botanical Research Institute, Lucknow jointly with the Institute of Petroleum, Dehra Dun. Since the entire R & D chain in this area will have a long gestation period efforts are to be started now to have the technology readily available in a reasonable time frame. The use of biological systems by harnessing solar energy could be a very effective mechanism, specially to check environmental pollution, resource depletion and promotion of decentralised energy supply. Biomass techniques also show promise of providing substitutes for uses presently met by petroleum products. For example, the use of bio-gas for cooking could cut down a demand for kerosene or oils for cooking purposes. Similarly the use of bio-gas engines could reduce the demand for diesel for pumping. Investigations on reduction of cost and on socio-economic aspects are underway.

In general it is proposed to give a fresh inputs and priority to the programmes for development and harnessing of renewable energies and their wide spread utilisation.

Atrocities on Scheduled Castes due to demand of fair wages

2622. SHRI R. R. BHOLE: Will the Minister of HOME AFFAIRS be pleased to state;

(a) whether Government are aware that there are increasing atrocities on Scheduled Castes because they demand fair wages from the landlords; and

(b) the steps Government propose for efficient land reforms and to ensure living wages to the Scheduled Castes and Scheduled Tribes to free them from social and economic dependence?

THE MINISTER OF STATE IN THE MINISTRY OF HOME AFFAIRS (SHRI YOGENDRA MAKWANA):
(a). The figures for the first three months of 1980 received from the State Governments so far generally do not show a rising trend compared to the figures for the corresponding period of 1979.

(b). Regarding land reforms, Government of India have already written to the State Governments. The Special Component Plan and the effective working of the Scheduled Castes Development Corporation will go a long way in improving the economic conditions of the Scheduled Castes. In order to strengthen the Special Component Plan for the development of the Scheduled Castes, the Government have recently introduced Special Central Assistance, as an additive to the States' Special Component Plan. The thrust provided by these measures is expected to go a long way in dealing effectively with atrocities and bringing about their development, specially economic development of the Scheduled Castes so that they stand on their own.

Fall in Production in Public Sector units

2623. **PROF. MADHU DANDAVATE:** Will the Minister of INDUSTRY be pleased to state:

(a) whether his Ministry is concerned at the fall in production in public sector units under its administrative charge; and

(b) if so, what concrete measures are being planned to prevent this trend?

THE MINISTER OF STATE IN THE MINISTRY OF INDUSTRY (SHRI CHARANJIT CHANANA):
(a) and (b). The overall production achieved in the year 1979-80 by public sector units in the administrative charge of the Ministry of Industry was much higher than production achieved by them in the year 1978-79. There is an increase of more than 10 per cent over the products during 1978-79.

Energy from Waste

2624. **SHRI K. PRADHANI:** Will the PRIME MINISTER be pleased to state:

(a) the efforts made by Government to obtain energy from waste in the country;

(b) whether encouragement has been given to bio-chemical researches; and

(c) if so, the details thereof?

THE MINISTER OF STATE IN THE MINISTRY OF DEFENCE (SHRI C. P. N. SINGH): (a) to (c). The Department of Science & Technology, Ministry of Agriculture and other Government departments have initiated several research and development programmes aimed at obtaining energy from various types of residues or so called wastes (which includes agricultural and animal residues, night soil, domestic, vegetable and industrial residues). Some important projects in this regard are: (i) All India Coordinated Project on Biogas Technology (coordinated by the Department of Science and Technology); (ii) Development of "Kachra" Gas Plant (Punjab Agricultural University, Ludhiana); (iii) Bioconversion of Cellulosic/Starchy Residues into Ethanol (Indian Institute of Technology, Delhi); and (iv) Microbial Production of Methanol from Methane (Indian Institute of Technology, Delhi). Development of Bio-chemical Technologies and Bio-conversion processes has been initia-