

# Bio Gas in Sri Lanka

G.K. Upawansa

Kandy, Kurunegala and Hambantota are the districts where bio-gas usage is very popular. In each of these districts there are over 100 bio-gas units. In Sri Lanka about 800 bio-gas units have been installed, mostly spherical model Chinese type. Of these 62 units are connected to toilets. The capacity of these units vary from 2 m<sup>3</sup> to 60, 80, 100 and 120 m<sup>3</sup> giants. Gas generated is used for cooking, lighting, pumping water, generating electricity, working refrigerators and also for charcoal smoothing iron. In some farms cooking, swill, boiling milk are also done.

National Livestock Development Board, Department of Animal Production and Health, Department of Agriculture, Ceylon Electricity Board, Agricultural Development Authority, Industrial Development Board, C.I.S.I.R., National Resources Energy and Science Authority, National Housing Authority are the Government Agencies involved in popularising bio-gas. Marga Institute, Lions Club and Sri Lanka Appropriate Technology Group also take interest. However there is no coordinated programme for research, development and extension of bio-gas technology.

Mid country Livestock Development Centre, Mahaberiyatenna, Teldeniya and Hambantota, Integrated Rural Development Project, have launched extension programmes with subsidies of approximately 50% of the total cost.

The popularising of bio-gas usage needs much more attention of the Government than is given at present because of long term multiple benefits. Under rural conditions 20 bio-gas units save one acre of 20 year old forest; saving trees is better than planting. Kerosene for lighting is not required. The bio-gas manure being the best, saves foreign

exchange spent on fertilizer by reducing the quantity used on one hand and increasing the absorption of chemical fertilizer by crops on the other. Bio-gas is a clean fuel and its manure used on crops helps to rehabilitate deteriorated eco-conditions and prevent pollution particularly by reducing the application of poisonous pesticides and Nitrogen to crops. Bio-gas is one of the cheapest sources of energy. 1000 family units will produce in terms of electricity 1250 KWh a day. As a source of energy for heating its efficiency is 70%. Installation of 1000 units including gas tubes, a lamp and a cooker for every unit will cost only 3.5 million rupees. Giving bio-gas units free to deserving farmers will pay back to the country its cost in a matter of a few years in terms of foreign exchange saving, saving of trees and improvement of environment and continue to benefit the country for many years.

The table below gives the materials requirement and cost of construction of various sizes of units with which cost of a unit can be computed. If all gains are taken into account the cost of installation with interest can be recovered in 12 to 15 months. When bio-gas replaces liquid

Mr. G.K. Upawansa - Diploma in Agriculture, BSc. Agri. (Cey.), MSc., Agri. Extension, Reading, U.K., has been involved in Agricultural Education and Agricultural Engineering. He was the Asst. Director of Agriculture, In-service Training Institute, Gannoruwa, 1975-80 and Principal, School of Agriculture, Angunakolapalassa, from 1980-83. He had written a book entitled "Manual on Small - Scale Integrated Farming" which was published by the F.A.O. in 1981. He is the Agricultural Officer in charge of Integrated Farming Systems of the Department of Agriculture.

fuel, kerosene or diesel, rate of return is greater than when replacing firewood and electricity, and costs are recovered in 8 to 10 months.

A locally made bio-gas cooker costs about Rs. 125/- and a lamp Rs. 150/-. Gas consumption too is relatively low in these cookers and lamps compared with that in other countries. The reliability of the units is 98% and some constructors give a five year guarantee of the units. In fact, five year guarantee is a life time one, because defects will appear during the first few months of operation. Considering the cost, and reliability the best bio-gas units in the world are found in Sri Lanka. This significant achievement is due mainly to thorough training of technicians.

Table - Summary of materials and costs

Volume m <sup>3</sup>	6	8	10	12	15	20
Number of Cows required	2-4	4-6	6-7	7-9	9-10	10-14
(m) Approximate gas production per day*	1.3	1.6	2	2.5	3	4
Bricks in Thousands	1.1	1.5	1.8	2.5	3.0	3.5
Cement in 50 kg bags	7	8	10	12	16	22
Water-proof cement kg	3	4	5	6	7	9
Sand cube	1 1/2	3/4	1	1 1/2	1 1/2	2
Lime bushels	3	4	5	6	7	8
3/4 metal baskets	2	2	2	2	2	2
4" P.V.C. pipe gauge 400 ft.	5	5	5	5	5	5
1/2" P.V.C. pipe ft.	2	2	2	2	2	2
3/8" round iron ft	10	10	10	10	10	10
Approximate labour cost of mason Rs.	750	1000	1250	1500	1750	2500
Approximate Total Cost	3000	4000	5000	6000	7000	9000

\* One cubic metre of gas is sufficient for a family of five for its entire cooking and about 80% lighting. If used to generate electricity it will produce 1.25 kWh.