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THE ENERGY CRISIS; POSSIBLE ALTERNATIVE SOURCES OF ENERGY TO OVERCOME IT.

We are warned that supplies of oil and natural gas will in time be exhausted. This has posed as a threat to the whole world because it will actuate a period of intricate industrial strife and unemployment since these resources are the main sources of energy in industries. Not only will industrialists be affected but also all other associated consumers. To the enlightened minds of scientists, economists and even the youth, the development and effects of this crisis has instilled a stir of concern. It is therefore necessary for all people to combine their ideas and formulate methods of obtaining the badly needed energy from any possible sources which are many.

One such source is the sun. Nineteen years ago an advertisement in an Australian newspaper said, "Do not waste the sun." About 35% of the sun's radiant (solar) energy strikes the earth and is reflected back to space. Another 15% is absorbed by the earth. For a long time the idea of tapping some of this energy has been churned in people's minds but only recently was it's practicability seen. It is now used to operate heating systems or produce electricity. A heating system based on solar energy requires a solar collector, heat storage unit and an auxiliary heater. Not only could solar energy be used for heating systems but also for electric power systems.

A solar photovoltaic power system requires a solar collector and photovoltaic modules. Such a system would provide power in any remote location to operate tools, pump water and run electric lights. The fuel is free and inexhaustible. It is non-polluting, completely quiet and operational anywhere in the Commonwealth and the world in general. With battery storage, it is a stand-alone system that makes electricity available day or night, and often it is more economical than other sources of remote power. These systems should be installed wherever convenient in one's country or anywhere in the Commonwealth.

Another possible source is biogas. In the sewage works and manure heaps where bacterial activity thrives, there is a gas that is produced which could be an invaluable source of energy. This gas (biogas) which is colourless and inflammable is of great economic importance and interest as a fuel for industrial and domestic heating. It is also formed during putrefaction of refuse in sanitary landfills and sewage sludge digestors where it's rate of production is very high. It is generally inert in these environments so it can easily be collected and used in other places. From the sludge digestors, the gas could be stored in steel cylinders under pressure. Previously, these wastes were discarded but it is now evident that they have potential to produce a lot of biogas. Unlike other chemical processes where high temperatures and catalytic promotion are essential, it requires little of these.

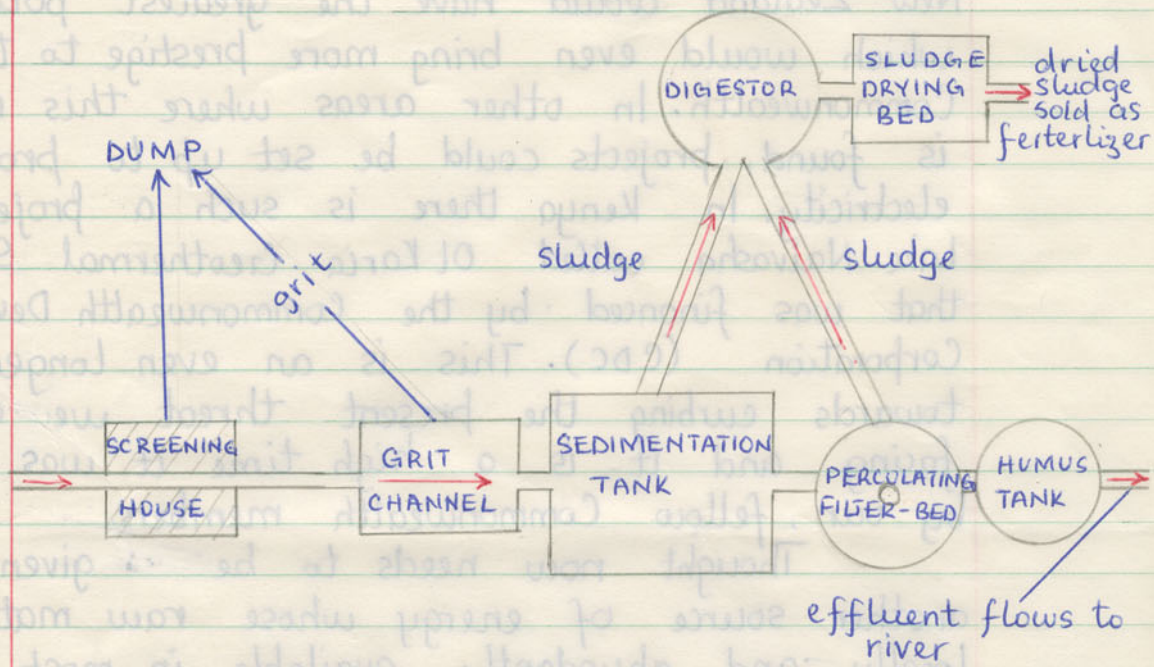

Fig 1. Typical lay-out of the sewage works.

Should the Commonwealth member nations adopt this, it would be of great benefict and relief from the current world energy crisis.

Alternatively we could have geothermal energy. In some areas of the world, there are huge amounts of steam trapped naturally under the earth's crust. Such areas that are gifted with this are, parts of the East African Rift Valley, the U.S.A at Yellowstone National Park and, it's adjacent areas and also New Zealand where there are numerous magnificent geysers. Little was known that these could be important energy sources. Today, this superheated pressurised steam can be conveyed through pipes to rotate coils between huge magnetic poles in electrical generators to induce alternating currents that can thereafter be used in industries and homes. Countries like

New Zealand would have the greatest potential which would even bring more prestige to the Commonwealth. In other areas where this resource is found, projects could be set up to produce electricity. In Kenya there is such a project near Lake Naivasha called Ol Karia Geothermal Station that was financed by the Commonwealth Development Corporation (CDC). This is an even longer stride towards curbing the present threat we are facing and it is a high time it was adopted by our fellow Commonwealth members.

Thought now needs to be given to another source of energy whose raw material is locally and abundantly available in most tropical countries. The raw material is from the sugar industry. Here the process of fermentation of sugar-cane juice is of utmost importance. One of it's bi-products is ethanol ("power alcohol") which is of great interest as a fuel. It is cheap and easily produced. It is almost as good as petrol in the sense that it can be used to power motor engines. For example, in Zambia the fuel is about 20% power alcohol. In Brazil it is almost 100%! Such countries have felt a relief from the present fuel crisis. This fuel could not only be locally available in areas where sugar-cane grows; it could be produced from sugar-beet which is found in many cool temperate countries. Since much of it is used to make beer, some of it could be divided off for use as fuel. This hitherto ignored source of energy is now a priority development in some countries including Kenya which has

such a project at Muhoroni currently producing considerable quantities of this fuel. Though the cost of technology involved is dear, it is relatively cheap to set up and yet highly efficient and economical.

Cow dung as many Kenyan coutry-side dwellers have found out, can be used to generate electricity and biogas at the same time. Better still is human refuse for the purpose of electricity. This was discovered where pits are still prevalently used as toilets in remote areas. These pits are usually about 20ft. deep. When they are filled with a considerable amount of these wastes and two wire terminals connected to a bulb dipped deep into the pit, it is found that some electricity is evidently produced. Some families have taken to this method and used it to run lights in their small huts. Unfortunately this would not work if used for heating appliances as these use a lot of electric power. This method, crude as it is, can be used as a foundation by scientists and elaborated upon to become an energy producer thereafter. A possibly convenient location would be the sewage works where the wastes are found in large quantities.

Another source of electricity though still in the embryonic stage awaiting research to ascertain it's capability is the thunderstorms on rainy days. They are most common over Central Africa, Brazil, Madagascar and Indonesia. The charge of lightning develops and collects in the thunderclouds called cumulo-nimbus. These are

heavy and dense clouds associated with heavy storms and rain. They have flat bases and a fluffy outline extending up to great altitudes. When the cloud cannot hold any more charge, it passes it to the next cloud or to the ground as lightning. These clouds need a continual supply of warm moist air to keep going or else they fall as rain. This would be another line of action for scientists to work on and find the possibility of obtaining this electrical charge by using tall pylons to attract it and store it in capacitors to be used as it is produced lest it passes to the ground due to the momentral storage of the capacitor.

These and many other ways of obtaining energy would be invaluable weapons to help to curb this energy threat that mankind is facing. The technology for most of these methods is there. All that remains to be done is to harness them in developing and developed Commonwealth nations where their application not only stands to save the badly needed foreign exchange but also provide cheap, easily available energy.

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