

Bio-gas in Environmental Development and Poverty Alleviation

by Mosharref Hossain Bhuiyan

POPULATION explosion, unemployment, gender discrimination, malnutrition and lack of adequate access to food, clothing, education, and healthcare are the prime factors that are constantly thwarting our thrust for environmental development and poverty alleviation. Besides, flood and draught, tornado and tidal bore, river erosion and flow of polluted water often with waste discharge from the neighbouring country are the chief causes for natural and man-made disasters.

The environment of Bangladesh is also being affected by the black smoke from mills, factories and vehicles, domestic and agricultural wastes, pesticides and chemical fertilisers, indiscriminate destruction of forest areas and poor afforestation process etc. As a consequence, much of our valuable forests are on the verge of being extinct. The land loses its fertility while many plants and animals are being wiped out from its surface. Also, the climate and human attitude are changing while social peace, and security are deteriorating due to this environmental disorder and resulting in constraint rise of poverty.

To maintain the balance of nature, a country needs at least 25 per cent forest area but we have got only 7-12 per cent. It is a great concern that the existing forest would be extinct soon if the exploitation of plants and trees continued at the present rate, and that the reserve of natural gas would be finished by the year 2020 if the present rate of consumption continued.

On the other hand, according to the UNICEF, 65 per cent of the people of our country still defecate in the open space and consequently 21000 metric tonnes of human excreta are mixed everybody with the surface water causing many diseases and consequent deaths everyday. For example, 120 children die out of every 1000 within the first years of their birth.

So, why don't turn these sources of death into a source of life — bio-gas when technology is available? Bio-gas — an available substitute — consists of methane (CH₄), carbon dioxide (CO₂) and small

amount of trace element. Bio-gas has no taste, colour or smell and it burns like the natural gas. But it does not form smoke or soot, so it does not pollute environment. This gas can be condensed to a great proportion having no risk of any ignition or explosion. That's why this gas is very suitable for internal combustion engine. Besides, the heat produced by bio-gas is far more greater than that from wood. For instance, 8260 kilo call heat is produced from the burning of 1m3 bio-gas. So, if it is used in internal combustion engine, it keeps on running without any loss of energy. The specific gravity of bio-gas, which is half in weight of air, is 0.55. The weight of CO₂ is twice than that of air. That's why CO₂ gets mixed with bio-gas as soon as it is emitted in the air.

Bio-gas is mainly used as fuel. Moreover, it is used for lighting, running vehicles

bio-gas. Besides, production of bio-gas can play a remarkable role in the development of existing sanitary system, while eliminating the constraints in fuel resource, checking the process of deforestation and increasing active participation of people, specially women, in the uplift of the socio-economic condition of the country. Bio-gas is capable of making immense contribution towards keeping the environment clean and pollution-free to a great extent as it is produced from cow dung, human excreta, poultry litter, kitchen waste, weeds, leaves, shrubs, water hyacinth, duckweed and many other organic waste.

According to a report in monthly Fisheries and Livestock Bulletin, April 1994 issue, there were 2 crore 32 lac cows, 7 lac 77 thousand buffaloes, 2 crore 97 lac 40

thousand goats, 10 lac 44 thousand lambs, about 13 crore chickens and 1 crore 34 lac 74 thousand ducks in Bangladesh. Moreover, 28 thousand metric tonnes of human excreta and 65 thousand 9 hundred 44 metric tonnes of solid and liquid waste are being produced daily from 12 crore people and their households and in-

dustrial sector. In an assessment, it has been found that through setting up of bio-gas plant an amount of 157 crore 59 lac 59 thousand 3 hundred 18 cubic metres of bio-gas and 1 lac 7 thousand 5 hundred 74 metric tonnes of organic manure can be produced by using the organic waste found from the above mentioned sources.

As a result, the demand for gas or fuel and sanitation of 69,90,685 families would be covered up everyday, while 1,04,793 trees would be saved from being chopped and thus environment would be saved and also scarcity of timber for furniture would be solved, side by side, the cost of 52,397 metric tonnes of fire wood would be saved.

A bio-gas plant can be set up with the excreta and organic waste of a 5-member family having 5 cows and the

volume of the plant is 41 cubic meter and 212 cft of bio-gas is being produced daily by which a commercial burner is burning for 8.5 hours a day since the inception of the plant in November 15, 1995. A commercial burner is equivalent to three normal burners. As a result, a total of Tk. 280.00 against 3.5 maunds of fire wood is being saved every day saving 1,02,200.00 maund of fuel wood every year.

The construction cost of the plant is Tk. 1,05,000 and the life span of the plant is estimated as long as 20 years. By the setting up of this plant, 550 people have been brought under sanitary facilities. Besides, in the process, 48,160 metric tonnes of polluted water could be treated and purified while 5 metric tonnes of fish would be produced through duckweed cultivation and duckweed-based pisciculture.

The following benefits will be available from bio-gas use: arrangement of safe sanitary system can be augmented; rate of personal cleanliness and hygiene practice will be increased; deforestation will be curbed and people will be inspired towards afforestation; the environment would be fresh and healthy with the elimination of the germ-breeding sources; organic fertiliser can be used as better substitute for chemical fertilisers.

The importance of bio-gas production in poverty alleviation and infrastructural development are: employment generation; use of bio-gas as complementary of natural gas to solve the fuel problem; local resources and manpower utilisation; increased fertility of land with the use of organic fertiliser produced from the bio-gas plant; development of socio-economic condition and increased participation of mass people along with women would.

Though bio-gas has immense potentiality, it does not have the proper backup. It is yet to be popularised due to improper implementation, design, estimation and non-feasible site selection. It is claimed by many implementing agencies such as LGED, BCSIR etc., that a bio-gas plant can be set up within a budget of 7-10 thousand taka.

In 1994, a bio-gas plant had successfully been established in Sreepur Shishu Pali Gazipur district with collaboration and management of Techno DIA. The

amount of gas produced from the plant would meet the demand of fuel of that family for the whole year. The cost to set up such a plant will be a total Tk 25,000 only and the life span the plant will be as long as 20 years. Also an important point to be noted is that the plant will not need any maintenance cost. In a calculation

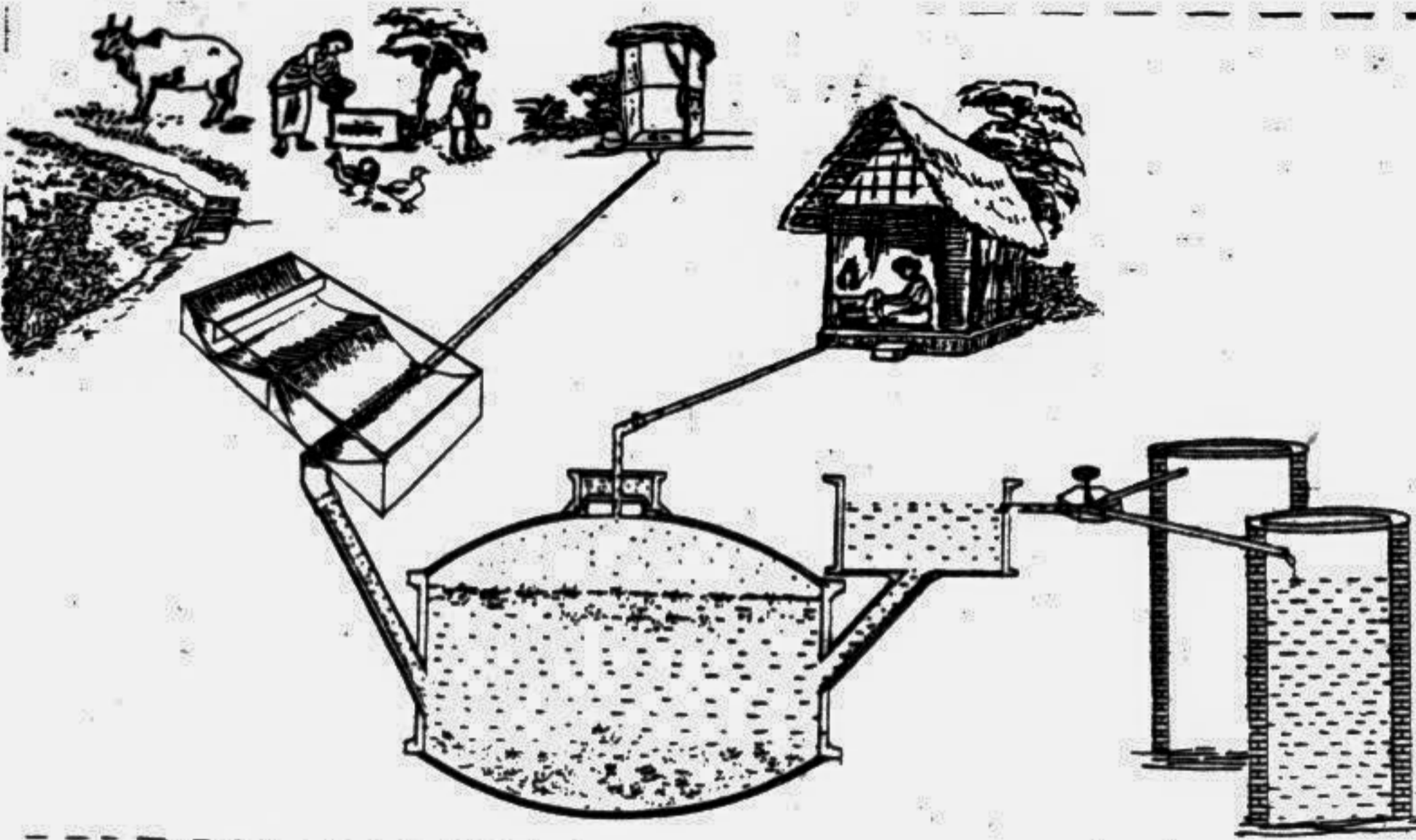
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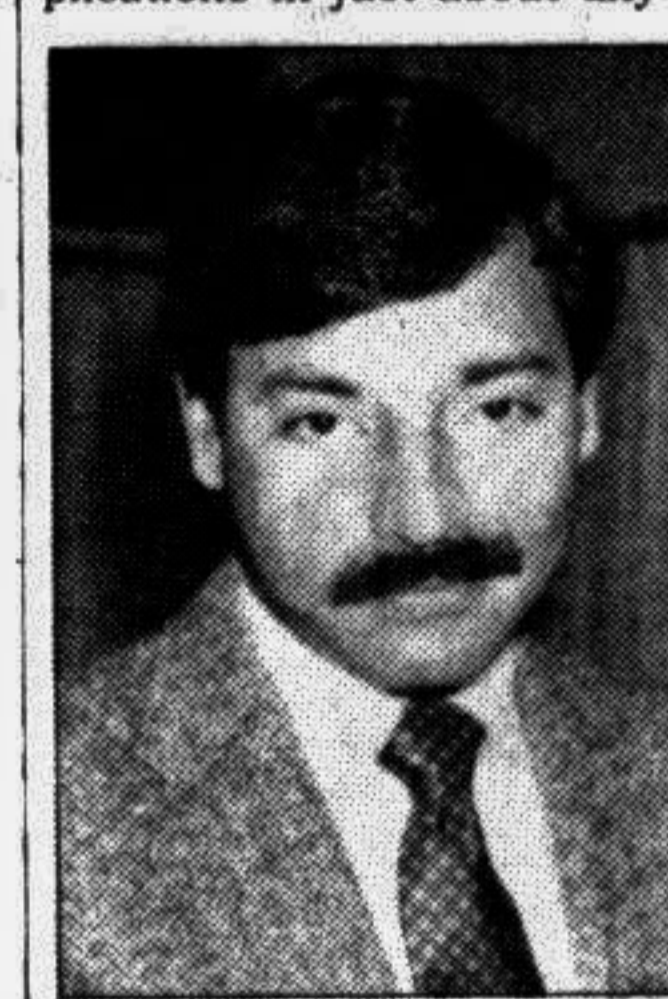
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A New Brand of Bangladeshi Expatriates

by Aasha Mehreen Amin

WHILE the dream of going to America in search of a better life will never die among the young and adventurous, of late there has been a growing disenchantment with what this 'better life' really means. Many Bangladeshi students, after spending a fortune to go to the US, find, when they actually get to their Eldorado, the only way to survive is to spend 50 to 60 hours a week washing dishes or driving a taxi and being submerged in domestic drudgery. With increasing tuition costs, exorbitant living expenses and only low paying jobs available, the wide-eyed Bangladeshi student is often cruelly awakened from fantasy land. Yet this is a rather stereotyped view of Bangladeshis in the US and does not include the growing number of young people who have acquired the necessary academic skills to be able to compete with their American counterparts and actually bag high paying, prestigious jobs.



Zubair Hussain: Eldorado no longer a far-fetched dream

One industry that has proved mutually beneficial for the employers and employees is the computer industry — one that has developed exponentially over the last decade. The need for more and more sophisticated computer applications in just about any

His greatest challenge at Silicon Graphics, has been able to deliver this world class state of the art (in terms of performance and complexity of design) RISC microprocessor — R-10000. "This system," continues Hussain, "has over six and a half million transistors in just one chip, the size of a thumb nail which can be used in everything — from a desktop to the super computers that perform extremely complex math solving for say, nuclear research, weather, economic modelling or space exploration."

The systems Hussain has helped develop have reduced the market for traditional super computers which cost 15 million dollars or more, and can provide equal and higher performance at a fraction of the cost.

Hussain's most interesting tasks was "to develop high speed mathematical algorithms and circuits to achieve extremely high floating point performance". Translated, this means higher performance systems that allow the creation of real time three dimensional graphics. Some of the applications of this system include developing the special effects in movies like Terminator II, Jurassic Park and Mask.

"With this system," adds Hussain, "scientists can test chemical structures of certain drugs to find out how they will react in humans without testing them on people. This can bring many important medicines much earlier into the market."

Hussain's present job at C-CUBE Microsystems is even more challenging. He is working on what is called digital video compression and decompression (MPEG) solutions. This sophisticated system will be used to produce extremely high resolutions in visual communication which will help to bring in motion picture quality video into computers. "Video teleconferencing will be possible through this system," says Hussain, "that is, you will be able to talk on the phone with several people and everyone can see each other."

MPEG can also be used for sending information from outer space. The Galileo Space Probe, for example, sends out millions of bits of data which take a long time to reach Earth; with this system only a portion of the data will be enough to form a picture and within a much shorter time.

For Bangladeshis like Hussain, computer engineering, he says, is a field that is both challenging and fulfilling in terms of job satisfaction and financial gain provided they have the necessary academic background. Racial discrimination is very rare, says Hussain, in places like Silicon Valley where companies lap up expertise regardless of what colour it is packaged in.

Hussain, who lives with his wife and eight-year old son in a suburb in San Jose, is quite happy with where he is in terms of his career. "There aren't too many places like Silicon Valley which has a culture of free thinking, entrepreneurship and proximity to institutions like Stanford and Berkeley," adds Hussain, the computer buff from Chittagong. For Hussain who is also a freelance photographer and big time nature lover, both occupations that can flourish in a place as scenic and temperate as sunny California, perhaps Eldorado is no longer just a far-fetched dream.

A group of people living in one locality or sharing similar beliefs and ideas form a community. Any activity towards developing its well being is termed as community development. With continuous degradation of environment, all around the world, and emphasis on better use of limited natural resources, the need for undertaking community development programme is on the rise. The role of people from different areas with diverse specialisation is the prime components in this process of development. Scouts who are one of the reflectors of society's advancement can effectively engage themselves in the community development programme.

For a developing nation like Bangladesh, the development activities usually focus on health and population programme, literacy campaign and prevention of environment degradation. Health and population programme is based on creating awareness about family planning, vaccines, drugs, drug abuse,

Better Scouting, Better Community

by Aminur Rahman



cleanliness, etc. thus popularising health care programmes and implementing through participation of both government and private sector. Similarly, the literacy campaign also strives to emphasise on mass literacy among rural population after developing general awareness. As environment is continuously threatened by man's inclination towards deforestation, therefore, development programmes, plantation of more and more trees and prevention of logging should be given priority.

In all these programmes, the coordination or manage-

ment is the prime focus and a leader or coordinator is the key player. Therefore, leadership developing skills are essential for the youths of the country who are to gear the future development activities. Scouting offers them an opportunity to development activities by encouraging their full potential and maturing their skill and virtues.

The world's population is growing rapidly, fueled by high growth rates in developing countries. Although the population control programmes in some cases have slowed down the growth rate but even then global popula-

tion is expected to cross six billion by 2000, where the developing world is expected to contribute nearly 90% of this increment.

This rapid increase will cause strain on health care system — where, with limited resources, the economies will have to accommodate the need of many more people. Infant and maternal mortality in the developing world is much more higher than the developed nations. Water borne diseases (cholera, dysentery) still threaten the well being of many nations. Proper training will develop the scouts with knowledge

on vaccination, EPI, eye and blood donation. The scouts under their contingent leader will approach the rural mass with posters and banners and will enlighten them on how to protect themselves better from common diseases.

Although global food production has increased substantially over the last decade ('80s) but the rate has been much lower than the growth rate of population. However, to feed the growing population, new techniques on agricultural production become a must. The emergence of green revolution in the 70s was the realisation of this demand but this revolution led to more mechanisation of agricultural, uses of chemical fertiliser and pesticides. Although the initial result was high yielding varieties of crops but soon the degradation of land was becoming apparent. Techniques maximise scarce water resources and conservation of energy; use of natural fertiliser and natural means of pest control is the prime factor to consider before outlining any plan for agricultural development. Scouts of today though receive more trainings on gardening and energy conservation, they should be given more baseline trainings on agro economic issues to develop skill in the related area.

Forests provide timber, food, fuel and other products for human consumption. Every year about 11 million hectares of tropical forests and woodlands are lost primarily in the course of clearing or fuelwood harvesting. The scouts, as one of the inner voices of the society, should strive to fight against this degradation of forest by getting more involved in plantation and plant protection schemes

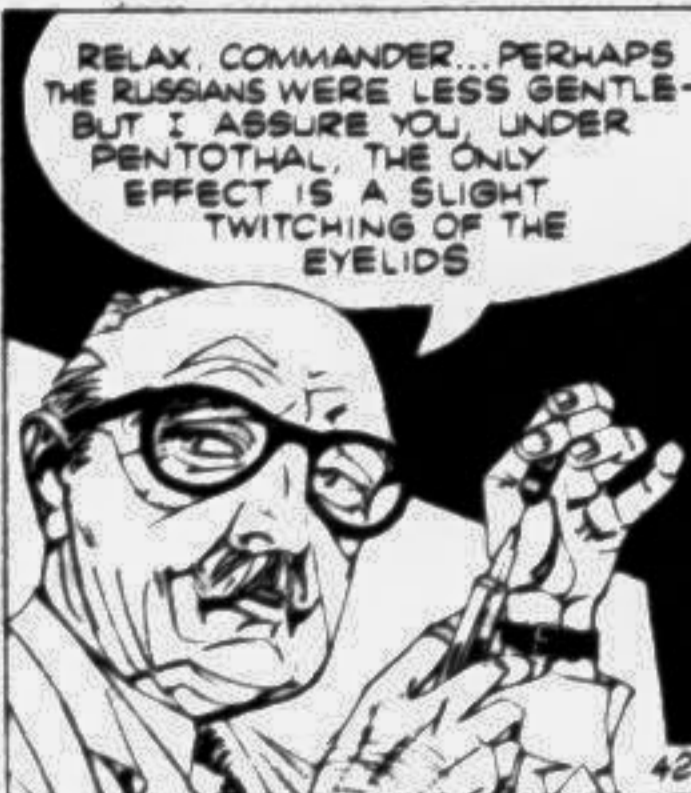
In some cases, the basic skills acquired by a scout on afforestation can help. However, more emphasis is required on involvement in mass plantation programmes, popularising green vegetation at households, creating awareness against increased use of wood fuel in lieu of gas, popularising the recycling concept of plastic and glass.

Natural disasters in developing nations have become common phenomena over the years and lead to destruction of lives and property of enormous values. Depletion of ozone layer and rise of the sea level have contributed to the increase in cyclonic storms, typhoons, etc. The cyclonic storm of 1991 in southern coast of Bangladesh still remains a painful experience for us. Loss of lives and damage of property, forest, roads, bridges, and other infrastructure call for mass awareness on disaster management. Although a brief training on repairing of roads and preparing for the cyclone shelter is provided to the scouts, they should be trained more on management of relief programme following a disaster and how to better coordinate with rural folks for repairing damaged culverts and bridges.

Here I have highlighted only three aspects out of many for development — Environment, Healthcare and Education. Education makes people literate and only literate and conscious personnel can contribute to the growth of healthcare system with prevention of the degradation of environment. Healthcare ensures healthy citizens and safe environment helps the agricultural or food production efforts. People with excellent leadership skill only can face these challenges. Better scouting helps develop youths to be dynamic leaders who in turn can build a better community.

Therefore, it is suggested that the training programmes for scouts should address these issues more than anything else if we are to meet the challenges of this endangered world.

Extracts from the paper presented at the 2nd Asia Pacific Community Development Camp (COMDECA) by the author.



TOM and JERRY

