Environmental Health Priorities With Some References To Jumla^x

Dr. Mathura P. Shrestha*

1. Man and his environment:

As a biotic community, human population also exists as a part of an eco-system-his total environment. Today man uses most of the energy stored by the eco-system for his food, conveniences, industry and trade. Man has dominated the eco-system by two ways- firstly because of his high level of understanding and technological ability and secondly because of his poverty, ignorance and multiplication.

In developing countries, specially in LD countries like Nepal, man has greater difficulty in adjusting himself with his food, water and sanitation, education and health care.

To help this situation out, the member countries of United Nations declared 1980's to be drinking water and sanitation decade to provide two of the most fundamental human needs-safe water and sanitary disposal of human wastes-to all people. World Bank estimated at 1978 that over 2 billion more people will have to be served with drinking water and sanitation, that is approximately half a million per day for the next 12 years. In our own country, if this target is to be fulfilled, 5000 people should be served every day for the next 10 years. The task is stupendous.

Water supply and sanitation technology developed in affluent nations is to suit

* This Paper was read in Environmental Sanitation Seminar, 2-4 September 1980, Kathmandu.

* Professor of Community Medicine,
Tribhuvan University,
Institute of Medicine, Kathmandu

their socio economic conditions. Grafting that technology in our country would not only mean impossible in terms of economic input necessary for it, but also unsuitable and hazardous technically and socially. Need is to look for cheap and effective alternatives developed elsewhere and to adapt, modify and innovate them to suit the needs of local people or to develop new and appropriate technology for them.

2. Prospects and Limitations of Medical Technology: Historical inferences:

Several researchers in health all over the world specially in the third world observed that provision of a good health services reduced morbidity rates to some extent but brought no significant changes in mortality rates specially in IMR. Modern health technology (curative and preventive) does not by itself bring significant impact on health without a change in socio-economic situation with resultant improvement in housing, sanitation, water supply and nutrition. Major decline in many communicable and preventable diseases in wealthier countries of the world commenced as the living conditions began to improve and long before the true nature of communicable disease was understood or long before the curative and preventive measures were understood. The sharp reduction of infant mortality in England and America at the turn of century was attributed to improved housing, food and nutrition by introduction of potatoes, wheat and other new crops, water supply, sanitation, waste disposal, refrigeration etc. It is often observed that improvement of health in socialist countries including China and Cuba is due to social and political stability, economic growth with fair equity and agricultural development, but has nothing to do with health technology. Nlich, Carlson and McKeown present convincing arguments that medical technology is usually useless, frequently harmful and tremendous waste of public and private fund.

However sudden economic boom in certain countries did not bring about significant improvement in the health of those countries.

In other instances, health interventions with many well-coordinated programmes in many countries gave positive effects in reducing childhood and general mortalities and problems of communicable diseases and diseases of low hygiene and sanitation. However the process is slow.

Whatever the historical instances, improvement of health of any one country follows only after improvement in community water supply, sanitation, housing, food and nutrition including storage and distribution, waste disposal and personal hygiene etc. Economic.

development and raised GNP do not by themselves bring about dramatic change in health status of population as is popularly believed, but equity of share of national incomes has definite impact on health due to socio-cultural upliftment.

3. Health and Environmental Conditions in Jumla:

Institute of Medicine, Tribhuvan University, with the cooperation of Johns Hopkins University and IHAP has recently completed community health survey of Jumla including functional analysis of health services available there and the population.

Preliminary field processing and analysis of a section of survey area (Chaudha Vis area) of 514 households and population of 3,123 have generated certain interesting and valuable informations. Principle findings were:

1. Very high mortality rates with IMR (200.5) CDR (29.8), 1-4 age specific mortality rate (89.6).
2. Very high fertility rate, and natural growth₂ of population.
3. High morbidity rate with 43 percent of population having some kind of illnesses every two weeks.
4. High handicap rate (4%) specially deaf mustism and blindness.
5. Major causes of infant and childhood mortalities were diarrhoea, measles, respiratory diseases, birth related conditions and malnutrition.
6. Major causes of adult death were chronic respiratory diseases and abdominal conditions including diarrhoea.

Environmental factors were directly or indirectly related to most of the causes of mortalities and morbidities.

7. Almost all the people are living in flat houses with no or poor ventilation³ and very poor natural lighting. Though rural and isolated, overcrowding with per capital total housing cubic space being less than 300 cu. ft. excluding animal shed area in ground floor but including kitchen, stores, empty spaces and corridors. Smoke pollution can be adjudged by heavy carbon black deposits in more than 99% of households and rooms, very high prevalence of chronic respiratory diseases among

-
1. Fertility rate (15-49 years female)=242.4 per thousand.
 2. Natural growth rate=2.9%
 3. Ventilation in sleeping rooms(None 62%, Very poor 19%, Fair 17%, good 2%, Excele Oent %)

adult population, very unefficient cooking tripods or stoves and high consumption of per capita fire woods—mostly pine woods. Structural strength of houses are generally poor.

8. Jumla has very high per capita goat and cattle population. They are invariably housed in ground floor of a household. Animal mortalities are very high and majority of existing animals are malnourished and diseased.
9. Less than 3% of population is served with piped water. Per capita household consumption of water is only 5.6 litres a day. Drinking water sources were: River/stream 48.6%, Spring with open flow drain before intake point 22.9%, Spring (direct) 23.6%, Kuwa (water hole) 1.4%, water tank 0.6%, piped water 2.9%. Piped water is almost always drained directly without filtration and treatment from river, spring, canal or cesspool.
10. Less than 3% (2.4%) used some kind of shallow pit and unsanitary latrine. Not all adults and none of children used them. For open defecation, 66.2% used jungle or cultivated lands and 31.4% used river sides, 'kulo' or ditches polluting surface water.
11. Sixtytwo percent of household had some kind of unshedded area called "khado" for refuse and animal waste disposal while 19.4% disposed along roadside and rest on the open space around the household.
12. Population of all kind of insects were very high. Flies, mosquitoes, sand flies, lice, bed bugs, fleas, midges, simulium etc. were major nuisances during summer and rainy season.
13. Drainage system were non existent. Rain water and sullage accumulated in "khado"* ground floors and pathways.
14. Personal hygiene were generally poor.
15. Health service available in the district was grossly inadequate.

In spite of the grim health and environmental conditions we found the people in Jumla very friendly, eager, self possessed and respectable. There has been much frustration among the people from slow and mostly inappropriate developmental works, empty promises, lack of all kind of services and isolation. But people listen to reason and are amenable to changes.

* "khado" is open pit where animal waste, straw-bits and dusts are collected and stored to rot for manure. This is comparable to a badly managed compost pit.

Why Environmental Health Priorities ?

In the place like Jumla, existing mode of sanitation and environmental conditions though primitive, might have been adequate if population was very low and isolated. Total effect of eco-system would balance the adverse effect. Growing contacts with other people due to migration pattern and new arrivals and very high population growth have eroded this sanctity due to over-burdened housing and available water supply, increased volume of fecal, bacterial and other pollutions. There is a striking balance between the spread of disease and population density.

Major causes of mortalities and morbidities in Nepal are related to environmental causes according to the surveys conducted in Tanahu, Bara, Dhankuta, Nuwakot and Surkhet. It is more so in Jumla.

Environmental factors form important route of transmission or precondition for most of the communicable diseases. In other instances they form an important part of vicious circle by increasing host susceptibility and exposure or by providing optimal condition for pathogen with their latency, persistency, multiplicity, invasiveness or pathogenicity and loading dose.

Environmental factors promoting chemical and physical agents in the genesis of certain non infective diseases are well known.

Environmental factors also play important roles in forming micro-climates for propagating and continuation of many vectors and agricultural pests even during unfavourable climate and conditions,

Certain conditions like poliomyelitis (and clinical typhoid according to Ashcroft) tend to increase their prevalence after initial improvement in sanitation. Under very bad sanitary conditions all are infected at an early childhood leaving older children and adults relatively immune to the condition due to long lasting immunity. After initial improvement in sanitation infection becomes deferred, becoming more prevalent and severe during later age. Although transmission of poliovirus are diminished after further improvement in sanitation, reduction of this is best carried by immunisation.

On the other hand improved environmental conditions will have direct and indirect benefits. Provision of adequate household supply of water has not only brought down the incidence of water washable diseases like trachoma, bacillary dysentery and scabies and

other infective skin diseases but also reduced water carried diseases like typhoid by dilution and by improving personal hygiene. Household water supply also decrease exposure to certain diseases like trepanosomiasis, schistosomiasis and oncocerciasis.

Provision of better sanitation and clean water supply thus would substantially decrease the mortality and morbidity of population. This would increase their productivity, decrease disabilities and absences from work force and decrease cost of medicine and care. In addition to these, the time saved and easier and comfortable life would promote individual innovations, bringing long term economic benefits.

5. Appropriate Technology and Human Factor

Appropriate technology is defined as environmentally or locally suitable, socially acceptable, reliable in service and production, easy to use and maintain and feasible at low cost preferably by using locally available materials and manpower.

Much is being done in the name of appropriate technology. Some go even to the extent of searching bits and pieces dumped by yester years of developed countries. Some graft appropriate technology developed elsewhere by way of imposition without considering human and social factors. However what may be good and effective in a country in relation to historical, traditional and political settings may not be suitable for other countries or regions. According to Anderson, "the evolution of each system is unique, complex result of historical and cultural trends and of political, economical and social tensions".

A good appropriate technology would result after a good working relationship between engineers, health personnels, educationists, economists, sociologists and community leaders. A double way learning channel between the technical personnel and people must be kept open.

To avoid imposition without consideration of human and social factors and to make a technology more acceptable, some ways could be found to involve community not only for the application of a technology but also during the phases of planning, developing, implementation and evaluation. Most appropriate technology will bring about maximum community participation and vice versa.

6. Certain Criteria for water Supply Formulation:

Provision of qualitatively safe water supply for rural population will not be possible for some time to come. Improvement of water quantity and accessibility will solve major health problems related to water.

In deciding priorities for water supply programme:

1. Collect basic informations like;

- (a) finances and resources available;
- (b) morbidity and mortality patterns;
- (c) survey of existing and potential water supply and usages;
- (d) aspects of community participation and support;
- (e) facilities available for maintainance.

2. Improvement of quantity and accesibilities is justified if:

- (a) the propopsed new source is at least as clear as the existing source;
- (b) it is not more liable to pollution;
- (c) the constancy and reliability flow is assured;
- (d) the number of co-users will not be increased out of proportion;
- (e) economically feasible for construction, distribution and maintainance.

3 Consider:

- (a) which community pays highest price for water;
- (b) which community's cost (in term of cash, time and energy saved to collect and cost of water related illnesses averted) cold be reduced;
- (c) which aspect of water improvemont will give gratest benefit.

7. Cartain Criteria for Sanitation programme ffom ulation

1. Conduct a physical survey to determine type of latrine, slab for and super structure, as well as topography to decide distribution of latrines in relation to households, pathways, water supply, trees etc.
2. Solve problem of fly breeding, offensive odour, foulness of structure and site, attraction of vermins and animals and pollution of surface and ground water.
3. Determine soil type, percolation rate, water table etc.

4. Determine source and amount of water for anal cleaning. (Other materials if other than water used for the purpose).
5. Explore any possibilities of misuses and malfunctions.
6. Explore the possibility of reuse of treated waste.
7. Explore the ways for maximum acceptance and participation.

Following criteria for excreta disposal system in LDC is recommended:

1. The surface soil should not be contaminated.
2. Ground water should not be contaminated.
3. Surface water should not be contaminated.
4. Excreta should not be accessible to flies and animals.
5. Handling of fresh excreta should be avoided or kept at minimum.
6. There should be freedom from odours and unsightly conditions.
7. Daily operation of toilet system should be simple and safe.
8. The construction cost should not exceed 10% of total investment in housing.
9. The constructions could be made of local materials and from local manpower and it should require minimal maintenance.
10. The use of water to dilute and transport of excreta should be avoided if possible.
11. Application of it in high density area should be possible.

8. Housing Criteria in Jumla

In view of high smoke emission and high incidence of chronic bronchitis in the population, housing project has a priority in the district. However due to the economic constraint only counselling and design facilities may be extended with following criteria:-

- a) ventilation and lighting should be adequate.
- b) warmth should be conserved.
- c) innovation should be cheap and locally feasible.
- d) smokeless and Lorena stove should be provided and adapted for room and space heating.
- e) innovation should be good to update existing house and
- f) should use minimum of timber.

9. Conclusions

If a man's right to health and clean living is to be ascertained, environmental health should be given due priority. In Jumla setting human waste management, supply of adequate clean water for the community and improvement of housing demand urgent priorities. Human factors and community participations should be considered at all stages of planning, programming, implementation and evaluation.

References:

1. Darling, F. F., Dasmann, R. F., "The Ecosystem View of Human Society", *Impact of Science on Society*, Vol XIX (2) 109-121, 1969.
2. Kalbermetten, J. M., Julius, D.S., Sumerron, C.G., "Appropriate Technology For Water Supply and Sanitation", World Bank, 1980.
3. McCoord C., "Medical Technology in Developing Countries: Useful, Useless or Harmful ? A position paper for National Academy of Sciences, Food and Nutrition Board Workshop of Effective Interventions to Reduce Infection in Malnourished Population. 13-16 June 1977. The Johns Hopkins University (mimeograph).
4. McKown, T. "The role of medicine—dream, mirage or nemesis ?", Nuffield prov. Hosp. Trust, London 1976.
5. Illich I. "Medical Nemesis", Pantheon, New York, 1976.
6. Karlson, R J, "The end of medicine", John Wiley and Sons, New York, 1976.
7. Davey, T. H., Wilson, T., "Dovey and Light body's. The control of diseases in Trobics" 4th Ed., H. H. Lewis & Co., London, 1977.
8. Shrestha, I., "Maternal and Child Health in Nepal" A thesis paper, Dept of Child Health Schl. Trop. Med, Liverpool, 1979.
9. Pacey, A (Ed). "Sanitation in Developing Countries" John Wiley and Sons, Chichester, 1977.
10. White, K.L., Anderson, D.O, Indulski, J., Marby J.H., Purla, T., Theoretical Orientation and Methods" in Kohn, R., White, K.L., (Ed). "Health Care An International Study", Oxford 4, Press, London, 1976.
11. Feachem, R.; McGarry M. Mara, D., "Water Wastes and Health in Hot Climates", John Wiley & Sons, London, 1977.

12. Mara, D. D. "Bacteriology for Sanitary Engineers" Churchill Livingstone, Edinburgh, 1975.
13. Rybezynski, W., Polprasot, C. Mc. Garry, M. "Low Cost Technological Options Sanitation", World Bank, 1978.
14. Cairncross, A. M., Feachem, R. G., "Small Water Supplies" Ross Institute Bul, No. 10, London, 1977.
15. Feachem, R., et al "Water Health and Development", Trimed Books Ltd.
16. Subrahmanyam, D. V., "Community Water Supply and Excreta Disposal in developing Countries", Andio, 1977.
17. Wagner, E. G., Lanoix, J. W. "Water Supply for Rural Areas and Small Communities, WHO Monograph No. 42, WHO, Geneva 1959
18. Winbald, U., Kilawa, M., "Sanitation without water" SIDA, Stockholm, 1978.

—:o:—

OVER 1000 PUBLISHED TRIALS ALL OVER THE WORLD
INCLUDING 30 TRIALS IN INDIA
PROVE THE TREMENDOUS SUCCESS OF **Septtran**[®]
IN BACTERIAL INFECTIONS

Septtran has all the advantages

- Broad spectrum activity
- Bactericidal action • Unique mode of action
- Development of bacterial resistance unlikely
- High plasma and tissue levels
- Minimal disturbance of intestinal flora
- Simple twice daily dosage
- **Septtran** as Adult Tablets, Paediatric Tablets and Paediatric Suspension is suitable for administration to all age groups.

For further details please write to us

© Regd Trade Mark of
Burroughs Wellcome & Co
(India) Private Ltd

15 Bank Street Bombay 400 023