SCIENTIFIC SESSION

(Overall Chairman and Rapporteur:Prof A.A. Sandosham)

ENVIRONMENTAL POLLUTION

(Chairman: Sir G. Newman-Morris)

Environmental sanitation and pollution in Malaysia

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A. INTRODUCTION

1. Pollution and Environmental Quality Objectives

The basic need in West Malaysia is for the development of clearly defined Environmental Quality Objectives to allow for determination of levels of pollution – pollution being measured in terms of the degree to which existing conditions fail to meet the particular Environmental Quality Objective accepted as desirable. With time new higher quality objectives may prove to be desirable and hence what was not considered to be pollution in relation to the old objective becomes pollution in terms of the new objective.

2. Proposed Objectives

Proposed Environmental Quality Objectives to be reached by say 1980 or 1985 in relation to Environmental Sanitation are as follows:–

1. Safe piped water to be supplied to 100% of the urban population by 1980, with 75 percent to be served through house connections and the remainder by reasonable access to piped supplies through standpipes within 100 yards of their homes. (This is the WHO World wide objective for 1980.)
2. Fifty percent of the rural population to be supplied with reasonable safe water by 1980, with 25 percent having direct house connections and the remaining 25% having access to standpipes or sanitary well within 100 yards of their homes. (The WHO objective is 25 percent but Malaysia should be able to exceed this due to its higher than average per capita income).
3. Twenty Seven percent of all urban population to be connected to sewers by 1980. (This is the WHO objective for 1980 but due to the large accumulated backlog Malaysia will probably not be able to achieve more than 18 percent by 1980 (Vs. 27%).
4. Seventy five percent of all rural population to be provided with satisfactory facilities for excreta disposal by 1980. (The WHO objective is 14 percent by 1980.)

It might be questioned as to what water supply has to do with pollution. First water is the principal means available to man for cleansing his person, his clothes and his home. Without water the level of sanitation and hence pollution of mans environment is

necessarily high. Second in the process of water being used, water itself becomes polluted and on discharge spreads the pollution to the land, drains, or rivers etc. As always we solve one problem but at the cost of creating new ones; thus the need for sewerage develops and following that sewage treatment, stream pollution control, and surveillance of food, fish and shellfish quality as it may be affected by pollutants.

Further objectives would include:–

1. Daily collection of solid wastes from all urban households by 1980 combined with the use of sanitary garbage containers by householders, and sanitary disposal of collected garbage.
2. Covering of all urban storm drains in commercial urban centre areas by 1980 to prevent undue contamination and access by disease vectors and vermin.
3. Conformance by all restaurants, hawkers, and other facilities engaged in serving food to the public with approved public health standards in relation to facilities construction and operation, education of food handlers and certification, and inspection by 1985.
4. Establishment and enforcement of maximum noise levels for residential, commercial and industrial areas by 1980.
5. Establishment of continuing programs of surveillance over fish, shellfish, shrimps, and other aquatic foods in relation to contamination by heavy metal compounds and other toxic substances by 1975.

– The list of objectives can be quite long but must also be geared to the reality of the situation and the ability to implement effectively.

Objectives would of course be adjusted to higher levels of quality and capability as new possibilities for improvement evolve. There is and should be no end to this process of continuing raising of levels of the quality of the human environment and of human life to meet the rising expectations of the people.

Present Status in relation to Objective

Considering the above objectives we have:–

1) In Urban Water Supply Malaysia is ahead of the WHO objectives of 60 percent to be served by house connections by 1980 with 66% presently so served (1970 Census), However this is only 38.5% of the projected 1980 urban population so much work must be done to maintain the present condition and more again to reach the objective of 75 percent of the 1980 population – in effect a doubling of all past achievements which is no small task. In addition the service through standpipes etc., to the remainder of the urban population must be greatly improved and extended.

2) In rural areas, thanks mainly to the J.K.R. (Public Works Department), systems Malaysia has already exceeded the 1980 objective set by WHO and is a little over halfway towards the objective set above. Further extension of JKR systems with more connections plus new efforts by the Ministry of Health are expected to allow for achievement of the objectives. (And large schemes such as Pahang Tenggara etc.).

3) In the area of Urban Sewerage West Malaysia badly lags behind other countries with comparable per-capita incomes. Prospects for being able to reach the WHO objective of 27 percent served by 1980 are negative and a major effort will be needed to reach 2/3rds of this or 18 percent. Without sewers densely populated urban areas cannot hope to achieve satisfactory levels of urban sanitation. Considerably more effort in planning and time is necessary for sewerage than for water supply, and construction and connection time is also considerably longer. Per-capita investment in the system alone is 2 to 2½ times that involved in water supply and in addition another equal amount is involved in house plumbing and facilities. (Total cost around $400/- per capita or more). The Ministry of Health, Environmental Health & Engineering Section has been actively promoting basic feasibility studies to support action in this area. The Ipoh study has been completed, the Kuala Lumpur Metropolitan Area study has commenced, and activities are in process for Klang, Johore Bahru, Seremban and other big urban areas.

4) Rural Excreta disposal should progress well ahead of WHO targets, mainly through provision of sanitary pour-flush latrines under Ministry of Health Programs. Activities involving

resettlement under major land development schemes will also contribute significantly in this area.

The capital costs of these programs is approximately:–

Urban Water Supply ..	$M206,000,000/- (75%+ SP)
Rural Water Supply ..	42,000,000/-(75%)
Urban Sewerage Systems	325,000,000/-(27%)
.... (Probable)	275,000,000/-(18%)
Rural Excreta Disposal ..	19,000,000/-(Govt)
	161,000,000/- (People)
Total National Investment	$M703,000,000/-

(About $M300M is cost to people & $M403M cost to Govt.)

There is also a significant operation, maintenance and an accumulating replacement cost involved.

Each of the other objectives listed needs attention and more detailed study and planning. It is not possible at this stage to make any predictions as to whether the stated objectives are realistic as basic data on the present status and needs is not available. What is needed is an initiative to "get the ball rolling".

B. PROBLEMS OF ENVIRONMENTAL QUALITY CONTROL

1. The Origin of the Sanitation Problems

(a) In the past populations have generally been small and more dispersed. Under these conditions the environment was able with the help of regular high intensity rains interspersed with strong sunshine to stabilize and absorb what were essentially human excreta and organic food wastes. As population even in rural areas has become more dense and urban centres have grown the waste load has increased and natural forces are less able to do an efficient job. Thus streams which once could be used for drinking water by rural people with only moderate risk have now become more heavily polluted and unsuitable. Other factors such as soil pollution, contamination of insect and other carriers of disease organisms, and food contamination have become progressively intensified.

What was once simple organic excreta and food wastes has tended to become more complex as detergents, insecticides, fertilizers and newer hormones and industrial chemicals have and continue to be increasingly used. This requires that the modern Environmental Control Engineers, Chemists, Biologists and others must have wider training and understanding in order to plan and implement control operations.

(b) The basic requirements for urban centres have long been known – the installation of pipes sewerage systems to collect and convey the wastes including excreta, sullage, and trade or industrial waste waters out of the urban area to a place of treatment or disposal. No urban area can be considered to be modern or sanitary without sewerage systems. By concentrating the waste water in one point the sewerage system makes treatment both necessary and feasible. A number of methods of treatment have been devised both mechanical and natural but they all essentially depend upon the action of living organisms in consuming the wastes as food and in the process stabilizing (or oxidizing) them. Such biological stabilization goes on at 2 to 3 times the rate under Malaysian temperatures of 30°C than under temperate climate conditions – a valuable asset. (A Natural Resource). Problems of treating the newer chemicals entering the sewerage can be difficult to resolve and as a result pre-treatment by industries is often required before their waste waters are discharged to sewers.

Older methods, and pit latrines have become (or always were) unsuitable to densely populated towns.

2. Pollution Control and Water Resources

Treatment of Urban Sewerage and Industrial wastes is necessary to control pollution of water resources in order to

protect the quality of the water for uses such as Water Supply, Fish & Shellfish growth, Industrial Use, Swimming and recreation, and agriculture etc. The costs of control must be carefully weighed against the value of the water uses in order to decide upon the level of control that will yield the highest return to the community and the Nation.

3. Protection of Community Water Supply Sources

Community Water Supply is generally accepted as being the most valuable use that can be made of water on a gallon for gallon basis. Thus most developed countries have made legal arrangements for protection of community water sources from contamination and to allow for transfer of water rights aquired for other uses to community use as needed (with compensation). Although Malaysia has implemented limited protection to some water supply watersheds more clearly defined and positive control is needed for the future. Procedures for aquisition of high quality water sources for community supply are also needed (e.g. Seremban).

4. Development of New Water Supply Resources

Due to the general abundance of the river surface water sources in the past it has not been necessary to consider building storage reservoirs in most cases and the potential ground water supplies have been largely ignored. It should be pointed out that on a World wide basis the quantity of fresh water in the ground averages 30 times that available from surface streams. The government is presently trying to assess this worthy of careful investigation. Ground waters are usually clear, which is require little or no treatment except chlorination, and are available at or near the point of use thus reducing the heavy costs of long supply lines and large distribution mains. Pollution of ground water can occur and can be serious when associated with modern chemicals and chemical wastes etc.

5. Designation of Beneficial Water Uses

The establishment of recognised beneficial water uses is basic to the problem of pollution control. This determines the quality of water which must be maintained and hence the treatment necessary for wastewaters and other measures for control. A great deal of work remains to be done in this area.

C. THE NEED FOR TRAINED MANPOWER

1. The Present Situation

Due to the wide and almost unprecedented avalanche of discussion and attention given to the subject of Environment over the last few years, principally originating from the developed industrial nations where environmental degradation had reached serious proportions, almost everyone who reads and listens has become informed on many aspects of the environmental problem. However, there is still a wide gap between general knowledge acquired in this way and the systematised knowledge and detailed understanding and competance of the trained specialist. Malaysia has a number of technical people who have acquired various levels of generalized and specialized competance in this area but to my knowledge no one with specialized and specific training in Environmental Engineering, planning or Management. Perhaps the nearest approach to this are the few who have had training as Public Health Engineers and who have acquired some measure of experience in dealing with problems in Malaysia.

2. A National Environmental Protection Association

What is needed is some form of organization to bring together the available competance in this area in the form of a "Malaysian Environmental Protection Association" with a broad charter capable of accommodating all people concerned with the problem. This should include people with professional training, government administrators, industrialists and business executives, and private citizens. The Association should establish active programs under its own task force or committee structure designed to develop and diseminate knowledge of Malaysian problems and should develop Environmental Policies designed to protect or enhance the

Malaysian Environment, to support needed action by Government, and to promote individual and public education. The Public Health group in your association can greatly contribute towards such an organization.

3. Training the New Specialists

Further there is need for early specialised training of a "new breed" of environmental specialist, Engineers, Architects, Health Doctors, Biologists, etc. to satisfy the need for competance in what will be an ever increasingly complex national and world environment. The lack of such trained specialists is clearly demonstrated in recent development planning reports which give verbal support to the idea of environmental protection and enhancement but are devoid of any plan to outline the "What" and "How" and "When" details that are essential.

Government is considering enactment of a new "Environmental Quality Act" to set up machinery for Environmental Quality Control but without the needed responsible trained and competant manpower such legislation cannot be implemented on a sound basis.

This is an urgent matter that needs immediate attention as it will take from 2 to 6 years to train needed people and longer for them to gain practical experience.

D. RELATED SUPPORTING ACTIVITIES

1. Environmental Sanitation and Epidemiology

The principal guide for the Environmental Quality Control manager in relation to the Public Health Aspects is the findings of the Epidemiological Service in relation to disease incidence, accident causes, mental health effects, noise effects, chemical effects of air and water, housing and overcrowding, and a range of other factors affecting the health and well being of the people. There is need for continued strengthening of the new "infant" Epidemiological Service of the Ministry of Health to provide intelligence as to what is happening to people and why and to give some answers as to what corrective measures are needed. Later this Service will play a valuable role in evaluation of the effectiveness of Environmental corrective actions taken which is needed to guide future program activities.

In support of Epidemiological Services there is further need for development of Health Laboratory Services and Medical Research, both now in Process. Expansion of Statistical services and mapping operations are also necessary.

2. Analytical Chemistry and Biology Services Etc.

New fields of Aquatic Biology, Fisheries Biology, Industrial Waste Chemistry, Air Chemistry, Radiation detection etc., all require steady development not only of the Department of Chemistry but of specialised evaluation capability in such offices as the Ministry of Health Environmental Health & Engineering Section, the J.K.R., and Dept. of Machinery as well as the proposed new Environmental Quality Control Agency. All of these activities involve further recruitment, training and integration of staff.

3. Environmental Studies and Education

Special support will be needed from University Scientific, Research bodies including social research groups for development capability to grow steadily. Eventually Environmental Studies will need to be incorporated in all education programs from primary schools to graduate studies. Advanced countries have already over the last few years entered into comprehensive programs of Environmental Education of the entire public starting with school children to fit them out with the necessary knowledge and understanding to be able to adapt to the rapidly changing environment of their countries and the world – Malaysia must also attend to this matter on a priority basis – The need for intensified efforts in the area of Health Education is recognised by the Ministry of Health with particular emphasis upon its effects upon Environmental Sanitation.

E. CONCLUSIONS

1. It is apparent that West Malaysia still has a large and difficult job to do in order to

maintain and improve its position with respect to urban and rural water supply.

2. A major effort is needed in relation to rural excreta disposal and urban sewerage which will require a strengthening of national priorities to provide needed support.
3. Preparatory work through development of programs to achieve objectives in Water & Sewerage together with provision and training of professional and sub-professional staff as for example in the Ministry of Health Sanitation, Environmental Health, Epidemiology and Health Education Sections needs reinforcement.
4. There is need for a National Environmental Quality Control Agency to draw together and give direction to the many fragmented partial and poorly supported agencies involved in activities affecting Environmental Quality. As the great bulk of these activities directly relate to the Health and well being of the people such an Agency should preferably be established under the Ministry for Health.

   A considerable volume of subsidiary legislation and regulations will be also needed but generally this needs to await analysis of the problems and development of trained people for management of activities.
5. Recruitment and Training of Professional Level Environmental Specialists is perhaps the greatest single need in this field. Competant leadership is a factor that cannot be dispensed with.

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The state of environmental pollution in the Philippines today

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INTRODUCTION

The satisfaction of man's basic needs depends upon his efficient manipulation of his own environment and its natural resources. In so doing various forms of environmental degradation of pollution result. In the beginning he may not notice the existence of such polluted conditions, but because of the cumulative tendency of pollution and the non-