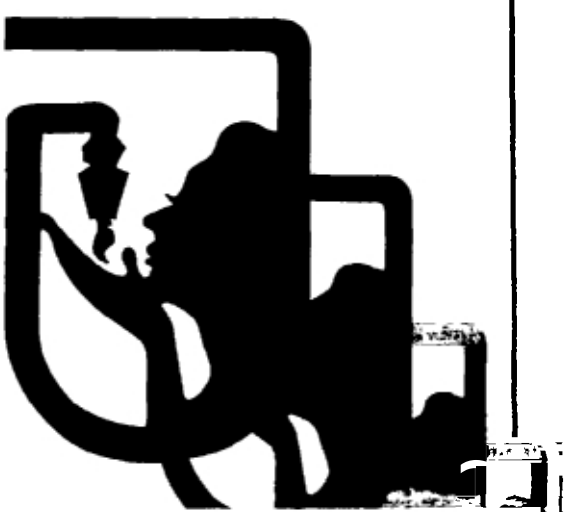
Strategies and Approaches for Community-Based Initiatives

A Source Book on Environmental Hygiene Promotion



Proceedings of the National Conference on
`Environmental Hygiene and Promotional Initiatives'

Jointly organised by:

Socio-Economic Units, Kerala &
International Union for Health Promotion and Education

STRATEGIES AND APPROACHES FOR COMMUNITY-BASED INITIATIVES

A SOURCE BOOK ON ENVIRONMENTAL HYGIENE PROMOTION

PROCEEDINGS OF THE NATIONAL CONFERENCE ON
ENVIRONMENTAL HYGIENE AND PROMOTIONAL INITIATIVES

Jointly organised by:

SOCIO-ECONOMIC UNITS, KERALA
&
INTERNATIONAL UNION FOR HEALTH PROMOTION AND EDUCATION

Strategies And Approaches for Community - Based Initiatives

A source book on
Environmental Hygiene Promotion
(Proceedings of the National Conference on Environmental Hygiene And Promotional Initiatives)

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&
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Not for sale

PERSPECTIVE

BACKGROUND AND GENESIS OF THE CONFERENCE

The national conference on Environmental Hygiene and Promotional Inititatives was held at Kanakakkunnu Palace, Thiruvananthapuram in Kerala during 19-20 December 1994. Two organisations engaged in water, environmental sanitation and hygiene got together in organising this conference -the Socio-Economic Units, Kerala (Integrated rural water supply and environmental sanitation programme; supported by the Governments of Netherlands and Denmark) and the Kerala Chapter of the International Union for Health Promotion and Education (IUHPE) under the South-East Asia Regional Bureau. Association between the two organisations have been for more than three years (since inception of the Kerala Chapter, IUHPE) in many areas of common interest, especially hygiene promotion and education led to the conduct of the national conference.

Kerala State has remained in the forefront on health status by any comparable and measurable standards. Despite the high 'literacy rate' claimed by the State, a 'high morbidity and low mortality syndrome' prevails. Even though Kerala enjoys the credit of having numerous safe drinking water sources and adequate sanitation facilities, a closer look will reveal a startling picture! Unclean surroundings add to people's agony and water-borne diseases call the shots. Fly nuisance and mosquito menace are among the many problems that increase day by day. 'God's own country', as the promoters of Kerala tourism call it, could even put the almighty to shame! It is also important to maintain clean environmental conditions through out the State and all over the country. Kerala has already earned a name, to be the first in achieving better social conditions. Considering the achievements of the State in various developmental activities, Kerala can show the world what it can do on environmental hygiene and promotional initiatives. It is in this light that this national conference was chosen to be held at Thiruvananthapuram, the State's captial.

Many agencies, governmental and non-governmental are engaged in different activities in the same sector -water supply and environmental sanitation. None of these agencies act in a co-ordinated manner. If only they all acted in co-ordination manner, the potentially obliging users together with various implementing agencies could have overcome most of the problems of the past. Perhaps, what they need is a little orientation for capacity building. The success of all developmental activities depend upon how strong, promotional initiatives are. Environmental hygiene being an issue deserving urgent consideration, this conference was meant to create a forum for like minded decision makers, experts, professionals and activists who can deliberate and come out with practicable solutions for the benefit of the country.

OBJECTIVES OF THE CONFERENCE

General :

Deliberate, analyse and evolve a practicable strategy for the promotion and sustenance of environmental hygiene.

Specific:

To evolve a practicable working strategy for improving the quality of life of the people.

To co-ordinate various groups working in the health and environmental sanitation sector.

To integrate hygiene education programmes with agencies in other sectors viz. agriculture, rural development, social welfare, health, panchayats etc.

To disseminate experiences and lessons learnt from past activities in the water and environmental sanitation sector with special focus on community participation and management.

PREPLANNING FOR THE CONFERENCE

The Socio-Economic Units, Kerala was planning to organise a conference on environmental hygiene promotion since 1992. This idea has been shared with the Regional Director, SEARB, Bangalore and the office bearers of IUHPE Kerala Chapter. However, it was possible to conduct the conference only in December 1994. Each stage of the development of the conference as well as the finalisation of the theme and subthemes has been discussed with the Regional Director and Advisor, Technical Division of SEARB. A conference planning team was identified from the office bearers of SEARB, and the staff of Socio-Economic Units, Kerala for the overall planning and management of the conference. (Details of conference planning team is given in annexure 1).

Conference methodology

The preparations for the conference started around June 1994 with a meeting of SEU staff and members of the Kerala chapter of IUHPE. Letters of intimation announcing the planned conference was sent around to a number of individuals and organisations working in the sector. Subsequent reminders were also sent to the same list of individuals and organisations. A rough list of potential participants for the conference was prepared. A joint meeting of the organisers of the conference was held, in which various sub-committees were formed, to work on assigned areas in connection with the conference. A brochure on the conference, its theme and objectives was prepared and printed for circulation among potential participants. This brochure outlined subjects to delegates for presenting papers on four different sub-themes as follows:

1. Personal hygiene habits and associated factors;

2. Environmental sanitation and role of communities with special focus on low - cost sanitation programmes;

3. Pollution and environmental hazards; and

4. Media and its role in social change of environmental hygiene and promotional initiatives.

The maximum number of papers were limited to 13 to provide maximum time for sharing of experience and group discussions. Abstracts received from delegates wanting to present papers at the conference were scruitnised by the Scientific Committee. Those papers that were accepted by the committee were short-listed for presentation. Final papers were received at a later date before the conference.

A Souvenir was prepared, including all abstracts of the papers, schedule of programme and messages from H.E. The Governor of Kerala, Hon.Chief Minister, Hon.Minister for Irrigation and Water Supply and Hon. Minister for Local Administration, Government of Kerala.

A group discussion on five different issues was planned with the guidance and support of Dr.K.A. Pisharoti, Advisor, Technical Division of IUHPE.

Exhibition

An exhibition on the theme "Women, Water and Sanitation" was planned to be conducted in connection with the conference.Ms. Riet Turksma, First Secretary, Women in Development Section of the Royal Netherlands Embassy, New Delhi offered to provide an extensive set of exhibition modules on the theme based on the experience of Indo-Dutch Water and Environmental Sanitation Programmes. The SEUs had also prepared to participate in the exhibition. Manufacturers and suppliers of materials related to water supply, sanitation and hygiene and health care products were contacted to participate in the exhibition.

Logistics

Various committees and sub-committees constituted for specific functions had independent responsibility to take care of arrangements within their function. Right from ensuring that confirmed delegates were invited formally, received and accommodated comfortably upon their arrival, registered and seated at the conference venue, the delegates and special invitees were taken good care of, through out the two-day conference up to the time of their departure.

AGENDA FOR THE CONFERENCE

The agenda for the conference was spread over two days to facilitate maximum time for group discussions and exchange of idea rather than merely concentrating on presenting papers and discussing upon it. The detailed schedule of agenda is provided as annexure 2.

CONFERENCE PROCEEDINGS

Inaugural Session

The conference was inaugurated by His Excellency The Governor of Kerala Sri.B. Rachaiah at a function presided by the Honourable Chief Minister of Kerala Sri. K.Karunakaran. Referring to WHO statistics, the Governor pointed out that 80% of all diseases was due to inappropriate use of water, poor environmental sanitation and lack of waste disposal facilities. Though Kerala had made significant progress in sectors such as literacy, health care and emancipation of women, the current scenario explained the need for increased coverage of water supply and sanitation programmes with active involvement of the people, the Governor stressed (please see annexure 3 for Governor's speech)

Delivering the presidential address, the Chief Minister Sri.K.Karunakaran said, in the wake of population explosion, industrialisation and urbanisation, the need for well designed and wide-spread distribution of cost-effective low-cost sanitation facilities through out the country was important and for the successful implementaion and management of such schemes, public participation was essential. Stressing on the importance of hygiene and sanitation at the community level for better quality of life, he reminded that a good beginning to such programmes had been given by the Government of India during IDWSSD (1981-1990) followed by the Technology Mission in 1986. An action plan for a 'Cleaner Kerala' was on the anvil, he said. He also expressed hope that Kerala would be first State in the country to achieve 100% sanitation coverage.(Annexure 4).

The Chief Minister released the Conference Souvenir by giving a copy to Prof.Lois Philip, Consultant, WHO, Geneva.

Exhibition

The Honourable Minister for Irrigation and Water Supply, Sri.T.M. Jacob inaugurated the exhibition on "Women, Water and Sanitation" organised as part of the conference. Inaugurating the exhibition, the minister reiterated that Kerala was the first state in the country to have a water policy, which emphasised on maintaining traditional water sources like wells and springs with the active involvement of the community. Referring to the "Cleaner Kerala" programme, the minister said, the preliminary report of the programme, which will be implemented jointly by the departments of Irrigation & water supply, Health, Education and Local administration has been prepared. (Annexure 5). A committee under the leadership of the Chief Secretary,has been constituted for this purpose.

Felicitations

Felicitations were offered by Dr. K.A. Pisharoti, Advisor, Technical Division, IUHPE, Sri.N.V.Madavan IAS, Secretary to Government (Irrigation & Water Supply), Sri.K.Mohandas IAS, Secretary to Government (Local Administration) and Dr. M.A. Aleykutty, Director of

Medical Education, Government of Kerala.

Dr.Babu Mathew, President IUHPE Kerala Chapter welcomed the gathering and Dr.K.Balachandra Kurup, Honourary Secretary and Executive Co-ordinator, Socio-Economic Units, Kerala proposed a vote of thanks.

Keynote Address

The Keynote address to the conference was delivered by Prof.Lois Philip, Consultant, WHO, Geneva. Talking about Environment and health, she noted that heredity and environment were two major determinants of health and well being. Of these, environment plays a significant role which at the same time offers a greater scope for intervention (Annexure 6).

In a special address, Mr.Peter M.Flik, First Secretary (Water & Sanitation) Royal Netherlands Embassy, New Delhi expressed his views on the theme of the national conference with special emphasis to the contributions of his government to Kerala and the success of the efforts taken by the Socio Economics Units in Kerala.

Scientific Session

The Scientific session consisted of presentation of papers and group discussions. The first day was devoted to the presentation of papers (over four sessions). Each session had a chair person, and two rapporteurs. Minimum time was taken by delegates for presentation and participants, later were given an opportunity to ask questions on presented papers. The whole idea was to ensure effective participation and interaction of members. Abstracts of papers received in advance before the conference were already circulated to participants to make their participation meaningful.

Cultural Programme

An interesting recital of the South Indian dance forms Bharath Natyam, Mohniyattam (traditional Kerala style) and Kuchipudi was performed by Mithilalaya Dance Academy, Vanchiyoor. The show was presented under the guidance of Smt.Kalamandalam Mythili on the evening of the first day of the conference.

Group Discussions and Presentation

The fore noon of the second day was completely devoted to group discussions. Participants were divided into five groups, each group constituted an inter-disciplinary representation. Each group was given a subject with some guidelines for discussions. The groups elected their own chairperson and rapporteur. The recommendations of each group were presented at a plenary for discussions. Discussions were held by different groups on the following five issues:-

1. Health aspects of environment.
2. Community participation for promotion environmental health.
3. Media to promote environmental health.
4. Training for health education in environmental health.
5. Inter-sectoral co-ordination to propmote environmental health.

Valedictory Function

The Valedictory address was delivered by Shri.C.T.Ahamed Ali, Minister for Local Administration on 20th December 1994. The Minister in his valedictory address expressed his pleasure about the working of the low - cost sanitation programme by the SEUs. He assured that the government will extend priority consideration to the recommendations of the conference.

Mr.Peter M. Flik, First Secretary (Water and Sanitation), Royal Netherlands Embassy, New Delhi stressed the need for preparing a proposal for a comprehensive sanitation programme in Kerala and requested the Government to make use of the expertise of the Socio-Economic Units, Kerala. He also said that he is waiting for the feed back from the organisers as well as responsible persons of the "Cleaner Kerala Programme" on the magnitude and strategy of the new programme.

During the valedictory function Shri.Gopal Krishna Pillai, Secretay to Government (Health & Family Welfare), Shri.Rudhra Gangadharan, Commissioner and Secretary to Government (Rurual Development Department) and Shri.K.Mohandas, Secretary to Government (Local Administration) addressed the gathering.

Mr. B.B. Samanta, Sanitation Coordinator, UNICEF New Delhi congratulated the organisers for conducting the conference as well as identifying a more relevant theme according to the current health scenario in the country. He spoke on behalf of the participants and expressed that the recommendations of this conference will provide greater insight into the planning and implementatin of the "Cleaner Kerala Programme" which was announced by the Hon. Chief Minister of Kerala.

OUTCOME

CONFERENCE RECOMMENDATIONS

Hygienic aspects of environment and organisational structure

The conference discussed in depth the influence of environment on health and hygiene. Recent documentations reveal that it is the household environment that carries the greatest risk to the health of people living in developing countries, particularly the poor. The domestic environment (according to latest world development report on health), comprises of inadequate water supply, poor sanitation ,inadequate garbage disposal, drainage, heavy indoor air pollution and crowding. In India and in most other developing countries, lack of access to safe water supply and adequate systems of safe disposal of human faeces pose a big challenge. In India, about 25% of the population do not have access to safe water supply and 85% are without sanitation facilities. Kerala is much better placed in the matter of availability of sanitation services (40%). The result is large scale prevalence of diarrhoea and intestinal infections. The availability of water supply in abundance is as important as the safety of water. All the participants agreed that provision of adequate and safe water supply and excreta disposal facility, both in rural and urban areas, should be priority areas for tackling problems on environmental health. In areas where the above two problems are being addressed adequately, provision of adequate drainage and disposal facilities for garbage should be the next priority item. The participants also discussed other enviornmental health problems arising out of industrial pollution, uncontrolled growth of population, unhygienic habits etc., and felt that clear cut priorities has to be established among these in order to utilise effecively, scarce financial resources. Considering all factors and the theme of the conference, the following recommedations were made.

1. Priority should be given to provide adequate and safe water supply in all urban and rural areas along with the provision of facilities for safe disposal of human excreta as these programmes will have maximum impact to improvise health and domestic hygiene.

2. As the next priority, attention should be given to promote drainage and proper disposal of garbage in areas where provision of water supply and sanitation facilites have progressed. The package could be expanded to cover drainage and garbage disposal. This will be in conformity with the objectives of establishing a "Cleaner Kerala" as proposed by the government.

3. Rural communities and urban slums should receive much greater attention than at present for the implementaion of the above priority programmes.

4. In order to make sanitation a way of life, it should be designed as an integral part of all housing schemes, educational institutions, places of work, farms and public places. Adequate provison, financial and personnel, should be made to see that facilities created are properly used and maintained.

5. The package of intervention should include both technical and essential software inputs. Software components consist of Information, Education and Communication (IEC), Community involvement, Involvement of women and other social groups and training of personnel.

6. Extra care should be taken to promote appropriate and low cost technology. A large number of options are available at present to choose from. Technology should be evaluated in terms of local needs and conditions to ensure that they are appropriate and acceptable. Dissemination of information on available low cost technology is necessary.

7. Taking into consideration the recent consititutional amendment and enactment of state laws in relation to the Panchayat Raj and Nagarapalikas, the responsibility for planning and implementation of water supply and sanitation programmes be vested with the local administrative agencies - rural and urban. This will provide for involvement of people and provision of adequate maintenance support. Only those schemes that are beyond the technical and administrative capability of the local bodies to plan and implement, and those covering more than one local body, should be executed by other appropriate agencies of the government and thereafter handed over to the local bodies for maintenance. Even here, the local bodies should be fully involved in all stages of planning, design and execution of the project.

8. Endeavour should be to include NGOs to the maximum possible extent either to assist or supplement the activities of the local bodies or government organisations. NGOs have the advantage and freedom to innovate and be flexible. They identify with the local needs and aspirations, build rapport with the people and hence have an edge over governmental agencies.

9. Local bodies should be given financial and technical support to plan and implement the programmes undertaken by them or assigned to them. Financial assistance from government, external agencies, institutions like LIC, HUDCO etc., should be availed and fully made use of. There should be provison for financial contribution by the community/beneficiaries.

10. Maximum efforts should be taken to promote inter-sectoral co-ordination in planning and implementing water supply and sanitation programmes. Ways to strengthen IEC is dealt with under separate recommendations.

11. To strengthen the infrastructure for planning, execution and maintenance of water supply and sanitation programmes, special attention should be paid to: **a**) increasing their capability to plan and implement educational aspects of the programme including community involvement; **b**) designing appropriate training and training programmes; **c**) Provision of facilites for research and development; **d**) provision for career development of the staff; **e**) provision for maintenance of facilities created; **f**) programme of advocacy and provision for montioring and evaluation.

Community participation for environmental hygiene

The available experiences indicate clearly that participation of community in planning and implementing environmental sanitation programme alone will ensure their successful implementation. While the word participation (or better involvement) has been interpreted differently, the conference felt that complete participation includes community involvement in identification of their health needs, getting priorities, planning, exploring solutions, implementing and evaluating the programmes decided upon. Government or other agencies will have to function as facilitators of action by the community. The participants from their experience, discussed in depth, many factors that essentially will support community involvement and identified as important among them, such factors as a) needs assessment by community; b) empowerment of the community; c) full utilisation of assets created; d) continuous monitoring and evaluation by community and hence providers of programmes under implementation so as to identify and remove bottlenecks; e) follow up and maintenance, and f) concentration of both hardware and software aspects of the programme. In this connection the participants felt that the technology offered should be appropriate and suitable to local needs and within the capacity of the community to absorb. Locally available technological options should also be explored. Efforts should be made to disseminate knowledge on existing technology. At the same time experiences have shown that there is need for continuous research and development of new technologies suitable for problem areas like water -logged, coastal region, hilly areas etc.

The participants also discussed in detail, the experiences of the Socio Economic Units of Kerala in involving panchayaths and local women's groups in water supply and sanitation programmes. The successful experiences provide a model capable of replication with modifications that are needed to suit the new Panchayathi-raj system. Some of the factors responsible for the success of the programme consisted of its non-political approach, flexibility in operation, innovation, learning by trial and error and transfer of responsibility to people in planning, implementaion and evaluation. After a review of all experiences and the importance of the subject, the conference recommended the following.

1. Recent enactment of legislations by the Central and State governments provide for a decentralised set up for planning and implementing all developmental activities including water supply and sanitation. The set up is ideal to promote people's involvement and intersectoral co-ordination. It is recommended that the set up be fully made use of to promote water supply and sanitation programmes. Suitable training be organised for the officials of panchayats and panchayath samithis to enable them perceive their role clearly and adequately perform these tasks. It is equally important that male members should specifically be oriented to perceive gender specific issues related to women and address them in an effective manner.

2. Initiate adequate steps to empower the community through praticipatory educational techniques. Empowerment to include decision making powers, financial autonomy and support and programme planning and implementaion responsibilities. The grassroots level workers should be trained adequately to guide and support such empowerment. Their present work load and attitudes should be looked into for correctives where necessary.

3. Make full use of local groups to function both as recipients of information and services and their dissemination. They can play a very useful role in removing social taboos, technical ignorance and provide social support to acceptance of innovations.

4. Preparatory work including surveys are essential before programmes are launched. This may be organised on a participatory basis between the service providers and local community representatives.

5. Special attention should be paid to the formation and utilisation of women's groups. Such groups, whether formal or informal, should be encouraged to take responsibility to plan, implement, monitor and evaluate Water Supply and Sanitation projects.

6. Non Governmental Organisations have been generally found to be very effective in promoting people's involvement. It is therefore recommended that NGOs be encouraged to be actively involved in promoting Water supply, sanitation and hygiene education and that partnership be established between the NGOs and Government/Panchayathi-raj institutions. The NGOs responsibility shall be clearly defined and the government provides administrative, financial and technical support to NGOs where needed.

7. Develop and disseminate appropriate technology, taking into consideration local needs and conditions including cost, affordability and acceptability.

Media to promote Environmental Health

In order to successfully promote environmental hygiene, with particular reference to water supply and sanitation and waste (solid and liquid) disposal, the group felt that people themselves will have to be empowered with the requisite knowledge, skills and attitudes that will enable them to take responsibility for their own and community health. Education is the key towards such empowerment and the process takes time to succeed. Both mass and inter - personal communication including small group discussions, have a major role to play in the educational process. Mass media covers print media, electronic media and cultural indigenous media. Each has a role to play and for maximum effectiveness, these media have to be used in a co-ordinated and mutually reinforcing manner. The selection of a particular medium is governed by the educational, social,economical and cultural status and practices of the recipient population; and their availability and known effectiveness. In general, the group felt that a multimedia approach, the mix being governed by the local circumstances will have a greater chance to succeed than concentration as a single media approach. It was also felt that where the literacy level is low, greater stress should be laid on inter personal approach, group meetings and training camps. After considerable discussions the group recommended that:

1. A multi media approach to promote water supply and sanitation should be planned and implemented. All concerned departments of government, NGOs, local panchayats and mass media agencies should be involved in its planning, implementation and evaluation.

2. Schools offer an important channel to promote water supply and sanitation messages. The curriculum of the formal education system should be reviewed to see that environmental health is adequately covered in the overall subject of health. The teachers should be trained to improve their knowledge and skills as effective trainers. The physical facilities in the school should provide for adequate water supply and sanitation facilities and people should be involved to ensure their proper use and maintenance.

3. A survey should be conducted to ascertain the availability of folk media in each state. Folk media representatives should be given adequate training so that they interpret the concerned messages in the folk programmes. Kerala has established effective alliance with NGOs like Kerala literacy group and the Kerala Sasthra Sahitya Parishad for promotion of folk media and each state could work out a pattern depending upon local circumstances.

4. A variety of IEC materials has been produced and tested for their effectiveness by a number of agencies in each state. It will be useful to prepare an inventory of available materials and their cost by a central agency. Wherever possible, existing materials could be adapted to suit local conditions. The gaps, if any, should be filled by production of new innovative materials by suitable agency.

5. Data available from the National Readership Survey should be analysed and utilised to plan and implement production and distribution of print media materials to the target population.

6. Many states have established village libraries. It will be useful to make studies of their use and coverage. Such libraries to be made use of to promote environmental health.

7. National events like Gandhi Jayanthi Day (October 2), Children's day (Nov 14) and Teachers' day (September 5) be utilised to promote water and sanitation programmes.

8. Suitable programmes be produced after pretest, for screening on Doordarshan and broadcast over All India Radio.

9. Women's magazines which are now targeting middle income groups and above, be requested to make efforts for promoting fundamental issues on sanitation and health for the benefit of its readers. Similarly the print media should be persuaded to cover adequately issues related to water supply, sanitation and hygiene.

10. It is not uncommon to find that audio-visual equipments supplied to various agencies are usually out of order, for want of proper maintenance and availability of spares and are not used. Plans have to be developed by each state to see that the equipment are properly maintained and budgetary allocations are made annually for purchase of spares. It is also essential that local groups are adequately trained to ensure proper use and maintenance of equipment.

11. The IEC materials should be designed carefully and very effectively. Apart form

accuracy of messages delivered, they should be made attractive, colourful and culturally acceptable. The materials should also be made to last for considerable time and should not get soiled easily.

12. Use of media to be well co-ordinated with an efficient, and acceptable service delivery system.

Human resources development

Development of human resources is key to promote environmental health both in rural and urban communities. The group felt that training and orientation is needed for all personnel from grassroots level functionaries to supervisory personnel at block and district levels, and planning and top management personnel at the state level. The absolute need to adopt a multi sectoral approach to solve environmental sanitation problems require that the training will have to be given to personnel from a variety of inter-related departments of health, rural development, Water supply and Sewerage Departments/Boards, education, information and broadcasting, tribal development, social welfare and others and also of voluntary agencies and community leaders. The training is to be planned as a conitnuous activity to include both initial and continuous training programmes at periodic intervals. The group also felt the need for decentralising the training activities so as to make them oriented to the local needs, field and practical based, and team based with focus on planning and implementation. In order to facilitate the training the group recommended that:

1. The training be broad based to cover personnel of all participating agencies both governmental and non governmental and of community leaders. Personnel engaged in programme implementation, supervisory staff and those in planning and management need to be covered. The focus of training of these categories will vary depending upon the functions expected to be performed by each category.

2. The training should be action oriented and designed for development of skills, carefully for grass root level programmes functionaries and their immediate supervisors.

3. Training objectives, content, methods and duration of training to vary depending upon the type of trainees and their functions.

4. Since adults learn in ways different from that of children, it is essential to keep adult learning prinicples in mind.

5. Interpersonal, participatory and gender specific approaches should be included in all types of training.

6. In order to make the training suitable to the local needs, practical, field oriented and team based, the group strongly recommended decentralisation of training of grassroots level functionaries and their immediate supervisors at block level. To facilitate this block level training teams drawn out from existing staff at Block level, should be constituted. The

training team should be given modular type of training at institutional level to enable them function as trainers for front-line workers and supervisors.

7. Each state should carry out a survey of training facilities available in that state. Such facilities are generally available in the departments of health, rural development, water supply and sewerage board and other agencies. The focus should be to utilise existing infrastructure with whatever strengthening, that is needed in the improvement of curricula, training of trainers, training support materials and training evaluation etc. Additional infrasturcture should be created only where it is absolutely necessary.

8. Establishment of an expert committee for each state consisting of health, engineering and social science professionals to identify the areas of thrust, duration of training, methods of training and preparation of training modules for different categories of personnel etc.

9. The group felt that the major thrust for training of grassroots level functionaries should be on construction and maintenance aspects, community participation and IEC, and, programme planning and implementation. Theoretical aspects should be included if found necessary during needs assessment. The middle level supervisory training should focus on the above plus programme planning, supervision monitoring and evaluation. State level personnel training to concentrate more on policy issues, programme planning and support to lower levels.
10. Periodic evaluation of training by outside agencies in addition to in-house evaluation by trainers should be carried out. Constant feedback on trainee performance in the field should be obtained from their supervisors, programme managers and community. Such factors should be fed back into the training programme.

11. To integrate training on environmental health with particular reference to practical aspects of water supply and sanitation and hygiene education with basic training courses for medical, engineering and para - medical personnel.

The need for Inter-Sectoral Co-ordination (ISC) and the agencies to be involved.

The conference recognised the need for better co-ordination and co-operation at the inter sectoral level, in the planning and implementation of the various programmes aimed at improving water supply and sanitation practices. Such co-ordination will not only ensure effective implementaion of programmes but also offer better utilisation of scarce resources. Experiences have shown that such co-ordination would require attention both at the structural and process levels. The participants also discussed the various contraints that now impede efforts at ISC and these are generally:

a) dilution of the national policy on water and sanitation during implementation by states.
b) sharing responsibilities for water supply and sanitation by many agencies.
c) lack of clear - cut directives from the highest level in the state.
d) lack of effective mechanism for co-ordinated planning.

e) for co-ordinated planning,implementation and follow up, ineffective functioning of the State Sanitation Cells where established due to the absence of stimulating agenda and sound terms of reference.
f) Insufficient funds and even where funds are available, administrative constraints in their use, and
g) Inter-departmental rivalry

In order to sort out these problems and promote ISC the conference recommended:

1. The creation of an inter departmental committee chaired by the Chief Secretary, to promote ISC. This committee should designate one department who will function as the nodal agency on its behalf to bring about ISC. The nodal agency should be vested with adequate powers and required expertise and finance to ensure its smooth functioning. If this is not possible, the committee should be assisted by a Water supply and Sanitation task force which will act as the secretariat for the committee in its planning monitoring and evaluation functions.

2. The widely dispersed responsibility for water supply and sanitation programmes in urban and rural areas should be reviewed and functions streamlined. As far as possible, water supply and sanitation for rural areas should be integrated under one department and ministry.

3. A Co-ordination Committee should be formed at different levels, particularly district and block levels, comprising representatives of all agencies concerned, including NGOs.

4. There should be a clear definition of the roles and responsibilites of each agency and of workers in each agency, and particularly their role in co-ordination.

5. All participating agencies and their staff should be adequately trained.

6. There should be periodic review at all levels on the progress in implementation and resolving of the problems encountered.

7. There should be an in-built provision for involving all participating agencies during planning, implementation and evaluation at all levels.

8. There should be provision for annual auditing of the functions of each agency and progress achieved.

9. Lessons learned from bilateral and multilateral projects should be carefully studied and incorporated in the larger planning process.

MEMORY LANE

Dignitaries being received to the dias

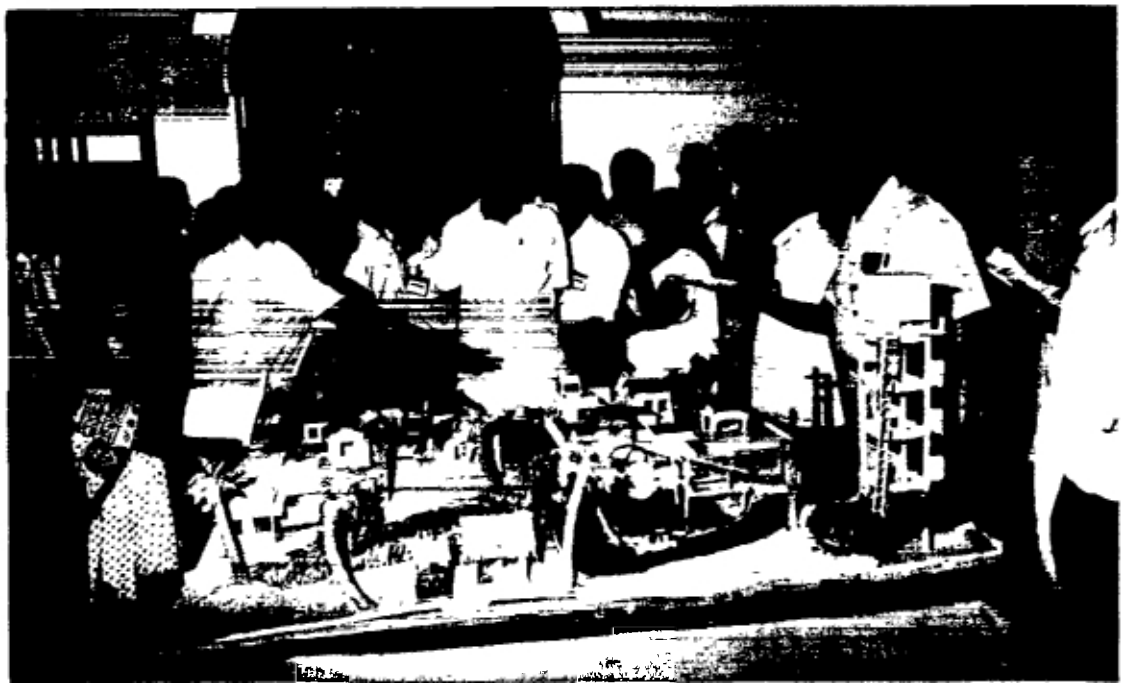
IMAGES.....

H.E The Governor of Kerala, Sri B.Rachaiah inaugurates the conference

Hon'ble Chief Minister of Kerala, Sri.K Karunakaran releases the conference souvenir
Dr.Lois Philip receives a copy.

Hon'ble Minister for Irrigation and Water supply Sri T M.Jacob
inaugurates the exhibition on 'Women, Water and Sanitation'.

Dr K Balachandra Kurup, Executive Co-ordinator, Socio - Economic Units and Honourary Secretary, Kerala chapter of IUHPE explains exhibits to the minister Sri T M Jacob.



Sri K A.Abdulla, Head of SEU (Central) explains a "dream village" to the Minister and delegates.

A cross - section of conference delegates

Hon'ble Minister for Local Administration Sri C T Ahmedali delivering the valedictory address.

IMPRESSIONS.......

THE HINDU

Stress on promoting 'total sanit

മാതൃഭൂമി

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'മലിനീകരണവിമുക്ത കേരളം'-300 കോടിയുടെ പദ്ധതി ഉടൻ: മുഖ്യമന്ത്രി

മംഗളം

ടൂറിസം വികസനത്തിന് ശുചീകരണം പ്രധാനം: മുഖ്യമന്ത്രി

ചന്ദ്രിക

'ക്ലീനർ കേരള' പദ്ധതി ഉടൻ: മുഖ്യമന്ത്രി

പരിസരശുചീകരണത്തെക്കുറിച്ച് തിരുവനന്തപുരത്ത് കനകക്കുന്ന് കൊട്ടാരത്തിൽ നടന്ന സെമിനാർ ഗവർണർ ബി. രാച്ചയ്യ ഉദ്ഘാടനം ചെയ്യുന്നു. മുഖ്യമന്ത്രി കെ. കരുണാകരൻ, എന്നിവർ സമീപം

THE HINDU

Stress on promoting 'total s...

From Our Staff Reporter

THIRUVANANTHAPURAM, Dec. 22.

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Lack of public participation

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മലയാള മനോരമ 1994 ഡിസംബർ 20 ചൊവ്വ

കേരള സോഷ്യോ-ഇക്കണോമിക് യൂണിറ്റിന്റെയും സെർവീനിന്റെയും ആഭിമുഖ്യത്തിൽ പരിസ്ഥിതി ശുചിത്വ സമ്മേളനം കനകക്കുന്ന് കൊട്ടാരത്തിൽ ഗവർണർ ബി. രാച്ചയ്യ ഉദ്ഘാടനം ചെയ്യുന്നു. മുഖ്യമന്ത്രി കെ. കരുണാകരൻ, മന്ത്രി ടി എം ജേക്കബ്, എം എ ഏറിക്കുട്ടി, ഡോ ബാബു മാത്യു, എൻ വി മാധവൻ, കെ. മോഹൻദാസ് തുടങ്ങിയവർ സമീപം

മനോരമ

കേരളകൗമുദി

സാമൂഹിക പരിസര ശുചീകരണ ദേശീയ സെമിനാറിന്റെ ഉദ്ഘാടനം കനകക്കുന്നിൽ ഗവർണർ ബി. രാച്ചയ്യ നിർവഹിക്കുന്നു. മുഖ്യമന്ത്രി കെ. കരുണാകരൻ, മന്ത്രി ടി.എം. ജേക്കബ്, എൻ.വി. മാധവൻ, കെ. മോഹൻദാസ്, കെ. ബാലചന്ദ്രക്കുറുപ്പ് തുടങ്ങിയവർ സമീപം

കേരളം 'ക്ലീനാക്കാനും' ഒരു പദ്ധതി

തിരുവനന്തപുരം: സംസ്ഥാനത്ത് ഉടനെ നടപ്പാക്കുന്ന 'ക്ലീൻ കേരള' പദ്ധതിക്കായി 300 കോടി രൂപ ചെലവ് വരുന്ന വിപുലമായ ഒരു പ്രവർത്തന പദ്ധതി തയ്യാറാക്കി വരികയാണെന്ന് മുഖ്യമന്ത്രി കെ. കരുണാകരൻ പ്രസ്താവിച്ചു.

ഗ്രാമവികസനം, ആരോഗ്യം, ജലസേചനം, തദ്ദേശ സ്വയംഭരണം എന്നീ വകുപ്പുകളുടെ സെക്രട്ടറിമാരടങ്ങുന്ന ഒരു സമിതിയാണ് പദ്ധതി തയ്യാറാക്കുന്നത്.

സാമൂഹ്യപരിസര ശുചീകരണത്തെപ്പറ്റി കനകക്കുന്ന് കൊട്ടാരത്തിൽ ഇന്നലെ ആരംഭിച്ച ദ്വിദിന ദേശീയ സെമിനാറിന്റെ ഉദ്ഘാടനച്ചടങ്ങിൽ ആദ്ധ്യക്ഷം വഹിച്ചു സംസാരിക്കുകയായിരുന്നു മുഖ്യമന്ത്രി.

പരിസ്ഥിതി മെച്ചപ്പെടുത്തുന്നതിനുള്ള പരിപാടിയുമായി ബന്ധപ്പെട്ട് ചീഫ് സെക്രട്ടറിയുടെ നേതൃത്വത്തിൽ ഉന്നതതല സമിതിക്കു രൂപം നൽകിയതായും അദ്ദേഹം പറഞ്ഞു. ജനപങ്കാളിത്തത്തോടെ നടപ്പാക്കുന്ന പദ്ധതികളിലൂടെ ചുരുങ്ങിയ കാലത്തിനുള്ളിൽ 100 ശതമാനം ശുചീകരണം കൈവരിക്കാൻ കഴിയുമെന്ന് അദ്ദേഹം ശുഭാപ്തി വിശ്വാസം പ്രകടിപ്പിച്ചു.

1991 സെൻസസ് പ്രകാരം ഇന്ത്യയിലെ ഗ്രാമീണ ശുചീകരണം 10 ശതമാനം മാത്രമാണ്. കേരളത്തിൽ ഇത് 45 ശതമാനമാണ്.

കേരള വാട്ടർ അതോറിറ്റിയുടെ സാമൂഹ്യ സാമ്പത്തിക ഏകകങ്ങൾ പഞ്ചായത്തുകളുമായി ചേർന്ന് 42 പഞ്ചായത്തുകളിലെ 80 ശതമാനത്തിലധികം ഭവനങ്ങൾക്ക് ശുചീകരണ സൗക [illegible]

[illegible] കൊല്ലത്തിനുള്ളിൽ 50,000 ചെലവ് കുറഞ്ഞ കക്കൂസുകൾ ജനപങ്കാളിത്തത്തോടെ നിർമ്മിക്കാനാണ് ഉദ്ദേശ്യമെന്ന് മുഖ്യമന്ത്രി പറഞ്ഞു.

രാജ്യത്തിന്റെ ചില ഭാഗങ്ങളിൽ ഈയിടെ പടർന്ന പ്ലേഗ് പരിസ്ഥിതി ശുചീകരണത്തിന്റെ അഭാവത്തെപ്പറ്റി നമ്മെ ഓർമ്മിപ്പിച്ചതായി ചടങ്ങ് ഉദ്ഘാടനം ചെയ്ത ഗവർണർ ബി. രാച്ചയ്യ പറഞ്ഞു.

ഗവൺമെന്റ് രൂപം നൽകിയിട്ടുള്ള ക്ലീൻ കേരള പദ്ധതിയിൽ തീരപ്രദേശങ്ങളിലും മലയോരങ്ങളിലും ശുചീകരണപരിപാടികൾക്ക് കൂടുതൽ പ്രാധാന്യം നൽകുമെന്ന് സെമിനാറിനോടനുബന്ധിച്ചുള്ള പ്രദർശനം ഉദ്ഘാടനം ചെയ്തുകൊണ്ട് മന്ത്രി ടി.എം. ജേക്കബ് പ്രസ്താവിച്ചു.

• പരിസരശുചീകരണം, ജലവിതരണം എന്നീ രംഗങ്ങളിൽ ഇന്ത്യയുടെ സ്ഥിതി ശോചനീയമാണെന്ന് [illegible] ലോകാരോഗ്യ സംഘടനയുടെ [illegible] പ്രൊഫ. [illegible] പറഞ്ഞു.

ഐ.യു.എച്ച്.പി.ഇ. ടെക്നിക്കൽ അഡ്വൈസർ ഡോ. എ.കെ. പിഷാരടി, ജലസേചന വകുപ്പ് സെക്രട്ടറി എൻ.വി. മാധവൻ, തദ്ദേശ സ്വയംഭരണ വകുപ്പ് സെക്രട്ടറി കെ. മോഹൻദാസ്, മെഡിക്കൽ വിദ്യാഭ്യാസ ഡയറക്ടർ എം.എ. ഏലിക്കുട്ടി എന്നിവർ ആശംസകളർപ്പിച്ചു.

...lian Express

INDIA'S ONLY NATIONAL NEWSPAPER

KOCHI TUESDAY DECEMBER

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The SEU had achieved 80 per cent environmental sanitation coverage in 42 panchayats, including Mala This was achieved with the contribution of labour, money and materials from even poor people.'

Governor B. Rachaiah, in his inaugural address, stressed the importance of safe drinking water since 80 per cent of all diseases came from inappropriate use of water and poor sanitation

Irrigation Minister T.M. Jacob said the ambitious ''Cleaner Kerala'' project would place special emphasis on the coast and the high ranges

IUHPE State chapter president Babu Mathew welcomed the gathering and honorary secretary and Socio-Economic Units executive director Balachandra Kurup proposed a vote of hanks. • ENS

THE HINDU

'Capital's sewerage system polluting rivers'

From Our Staff Reporter

THIRUVANANTHAPURAM Dec 21

The entire sewerage system in the State capital is practically defunct with raw sewage finding its way through punctured manholes and leaky sewer lines into open lands or surface water bodies according to a paper presented at the national seminar on environment hygiene which concluded here on Tuesday The seminar was jointly organised by the Socio Economic Units, Kerala and the International Union for Health Promotion and Education

It is pointed out that the existing drainage system in Thiruvananthapuram city is virtually ineffective in conveying the voluminous load of charged ultimately in the Parvathy-Puthanar

Firstly it is pointed out that the channels running across the farm are poorly maintained and most of them are blocked up or broken Due to this these channels are not in a position to convey the entire sewage uniformly into the cultivable areas Secondly the available area of cultivation in the farm is neither capable of absorbing the total sewage reaching the stilling basin nor is it being fully utilised.

The samples of the sewage effluents were found to contain a large amount of organic putrescible matter which needed appropriate treatment before being discharged into open water bodies the paper says The sewage sludge in the

വീക്ഷണം
Progressive National Daily

പരിസര ശുചീകരണത്തിന് ഉന്നതതല സമിതി- മുഖ്യമന്ത്രി

THE HINDU

Suggestions for promoting environmental health

From Our Staff Reporter

THIRUVANANTHAPURAM, Dec. 21.

A number of suggestions for promoting environmental health in the State have been put forward by a two-day national conference on "Environmental hygiene," jointly organised by the Socio Economic Units, Kerala, and the International Union for Health Promotion and Education.

The Chief Minister, Mr. Karunakaran, who inaugurated the conference on December 10, announced that an action plan was prepared for launching a "Cleaner Kerala". The Irrigation Minister, Mr. T. M. Jacob, invited specific suggestions which the Government could use as guidelines for the project.

A sum of Rs. 300 crores has been estimated for the first phase of the project. The Government plans to raise the amount through financial agencies.

It has been suggested that water supply, sanitation, slum improvement schemes and waste disposal facilities should be given priority while implementing the environmental sanitation programme. Local bodies and non-governmental organisations should be put in charge of the programmes to ensure their sustainability. These bodies have a rapport with the people.

The involvement of women at all stages and levels of the project has been stressed. Some local groups such as Mahila Samajams, Youth Clubs, WWC, etc. for ensuring maximum utilisation of assets, reliable feedbacks and message transmission, has been stressed.

The Conference recommends that water supply and sanitation should be integrated under one Government Department. Proper directives should be issued to all the departments concerned with the project to ensure optimum coordination, and adequate funds should be allotted to them. The State Sanitation Cell should be strengthened and a nodal agency should be set up to monitor the planning and implementation of the programmes with the help of inter-department committees.

Regarding [illegible]

The Governor, Mr. B. Rachiah, inaugurating the Sixth national conference on 'Environmental Hygiene and Promotional Initiatives' at Kanakakunnu Palace in Thiruvananthapuram on Monday. The Chief Minister, Mr K. Karunakaran and the Irrigation Minister, Mr T. M. Jacob, are also seen.

PRESENTATION

ENVIRONMENTAL CAUSES OF MORBIDITY : A CASE STUDY

Dr. R.Jayasree
Reader,S.P.Mahila University
Tirupati.

Environment and human health are inevitably interlinked and a healthy environment is essential for the health and well being of the planet and its inhabitants, who depend on it for the air they breath, the water they drink and the food they eat. Also an unhealthy population produces less, and may be forced into practices damaging the environment (WHO, 1986). From the above statement it is confirmed that the quality of human health is unattainable in a poor quality environment. On the otherhand, for attaining better health and quality of life of human beings, everyone should have access to basic necessities of life such as unpolluted air, adequate clean drinking water,sufficient amount of hygienic food and safe shelter. When we consider the relationship of environment and human health, the relationship between women and environment is vital, because of their close acquaintance with environment as consumers and providers of daily lives such as the provision of water, fuel, food and other basic needs. Hence these women not only bear the brunt of environmental degradration, but also play a crucial part in environment management.

From the above background the present paper tries to identify the environment causes of morbidity or ill-health among women and children in the village settlement of Gandhi Nagar popularly known as Pathakaluva, in Chittoor district of Andhra Pradesh.

Description of the village settlement and the people.

This village settlement is situated about 10km away from the temple town of Tirupati towards Chittoor Road. This settlement lies nearly 2km to the interior from the main road surrounded by rocks; mining/quarrying is the chief occupation for the past 50 years. The total inhabitants of this settlement consists of 200 households. All these settlers have migarted from Salem and Dharmapuri districts of Tamil Nadu and settled there. They belong to backward castes such as Kounder and Boy castes. The people, irrespective of age and sex are engaged in quarrying. Majority of them are bonded labourers. The contractors used to give an advance of Rs.5,000 to 10,000 to each family, besides a small hut for their shelter. Once the labourer accepted this agreement, he had to work under the contractors. The wage is calculated on the basis of piece rate. Half of the wages earned by the labourer goes to the contractor and only half of the benefits earned are received by the labourer. All the family memebers irrespective of thier age or sex are engaged in this work. Even the small children between the ages of 5 and 6 lend a helping hand to their parents as labourers. Hence most of the couples have more than five children. Children are considered to be assets and on the other hand the cost of child rearing is very minimal among this population, because they are not concerned about their children's education or better health or quality of life. Another interesting determinant of high fertility among these population is the absence of dowry and other marriage expenses. Most of the marriages take place within relations only.

The basic infrastructural facilities such as accessibility to roads, eletricity, sanitation and health, education, market and provision shops etc., are nil. Water, the foremost basic neccessity was also out of question for these people until recently. However, at present, they have a hand pump (Thanks to the department of Women's Studies S.P.M.V.V and Rotary Club, Tirupati). Prior to this, the villagers (women) used to walk nearly 2km to collect drinking water for which they had to pay Rs 20/- per month per household.

There are nearly 200 children of primary school- going age who have not been enrolled in school. Only five children are attending school in a near by village. The non-availability of Tamil medium in the school is one of the reasons reported by the parents for not sending their children to school. Besides, children of this age group are busy in quarrying. There is a Balwady in this village settlement set up by the Social Welfare Board. But, from the past one year, no teacher has been appointed; at present there is only an Ayah, who prepares and distributes supplementary food to the children.

Health care facilities are totally non-existent. None of the village health staff visit this village. Only when they have any serious health disorder, they avail the services at government hospital, Tirupati.

Though quarrying is a fulltime occupation among all people, the women in particular have an endless round of multiple tasks such as quarrying, water carrying, fuel collection, cooking, child bearing and child care.

The staple diet of the people in this village is only rice with dhal or rasam. They eat rice at breakfast and dinner. Mostly they do not take lunch. Milk and milk products do not form a part of their food. Green vegatables and fruits are also very rarely consumed. Once in a week they eat beef or mutton. No special food is being provided for children and pregnant women. Shopping is done by women. Once in a week they buy the rice and other provisions from Tirupathi. Most of the villagers do not possess a ration card. They buy the things from the open market. Economically, these people are far better than other rural poor, because they can work on all the days in a year. On an average, Rs 500 is the weekly income for each household despite the high rate of exploitation by the contractors.

The depletion of natural resources leading to environmental degradation has a siginificant effect on the daily life of women; women must walk farther from their homes in search of fuel wood and water. This extra distance not only adds to their physical burden but requires more time, which in turn affects their work schedules such as child care, cooking and reduces their leisure time. Shortage of fuel leads them to cook breakfast and lunch together. Preparation of tiffins take more time and requires more fuel, hence they avoid it.

Environment and Health:

Women all over the world work longer hours than men, and are under- nourished and in poor health. However, the extent of the health impact on women in relationship with the environment is most pronounced in the rural areas of the developing world. This is mainly due

to the multiple roles performed by the majority of poor women in developing countires. She does the triple-role of home-maker, economic provider and reproducer in a number of categories. These risks tend to reinforce each other to the detriment of their overall health status.

The conditions and factors such as immediate environment (household and immediate surroundings) and the local village environment coupled with the health related behaviour pattern have negative health implications for women and their families.

In the immediate environment , shelter is a crucial health determinant. What we analyse this factor in this population, all the households live in a single room thatched hurt without any ventilation or other basic facilities. This single room is used as kitchen as well as bedroom. Minimum 6-8 members sleep in this rooms. This overcrowding has had a definit impact on their health conditions such as frequent infection and respiratory problems. Here again , women are doubly vulnerable , due to the lack of ventilation, while cooking and the hazard of smoke. This indoor air pollution in one of the prime causes of high rates of respiratory disorders among women. Infant and children also bear the brunt of indoor air pollution because they stay at home along with mothers. Coupled with indoor air pollution the working atmosphere of polluted air with dust and other particulates make women more prone to diseases. More than 50% of the women suffer from chronic respiratory disorders and eye diseases, which are the outcome of this environmental hazards. The condition of children are still worse. 90% of the children suffer from cough and running nose. However, it is susrprising to note that the people b elieve and accept these diseases as part of their lives. They are ignorant of their children's sickness and ill health.

The deteriorating home environment and insufficient food intake by women and children increases the threat to their health. Here imbalance and lack of nutritious food are the major problems rather than insufficient food. As mentioned earlier, due to the lack of time and shortage of fuel, coupled with ignorance, lack of awareness and accessibility prevents them form preparing nutritious food. Almost all the people, especially women and children have one or the other vitamin and other nutrition deficiency diseases such as angular stomatitis, anaemia, red hair, skin disease etc. Severe malnutrition disease like stunted growth, Marasmus and Kwashirokar have also been noticed among the children. Various disease manifestations due to poor water and sanitation also has its own place in their life. Until the recent past, safe water source was 2 kms away from their settlement. Now, though they have a hand pump in their vicinity, the proper mangement of potable water is yet to be developed. For the other domestic activities barring cooking and drinking, they collect water from the near - by unprotected source (for cleaning vessels, washing, bathing etc.,). Here again, women and children are more prone to carry infections because they are the handlers of water for domestic activities. Once they are affected with diarrhoeal diseases and other water- borne diseases, the mothers have to look after them; this may affect them also. Non-availability of sanitation and sewage management would be a cause of gynaecological problems such as urinary infection and white discharge among these women. Unhygienic menstrual care doubles the vulnerability of women to diseases. Most of the women reported that the lack of privacy during menstrual cycles force them to be unhygienic, which in turn led to severe infections. It is important to note that, recently a woman aged 38 died due to heavy white discharge and other gynaecological problems

coupled with inadequate medical care.

The skin diseases and scabbies, due to the poor environmental conditions have also affected women and children. Personal hygiene has a very big role in the control of these diseases. Mothers have no time to take care of their children's cleanliness. Children always crawl in the mud and other unhygienic surroundings. Besides, the dust particulates of quarrying causes skin diseases among the adults as well as children.

These are some of the morbidity/ill health conditions caused by poor immediate environment coupled with illiteracy and ignorance. It is interesting to note here that a case study of a poor woman and her children's ill health due to ingorance coupled with poor environmental conditions.

Case Study :

Kalyani is quarry worker who is 28 years old, married and living with her husband and five children. She has three sons and two daughters. Her husband and children are also engaged in quarrying.

She got married at the age of sixteen, she is a migrant labourer orginally from Tamil Nadu. She migrated to this place only three years ago. Immediately after her marriage, the couple migrated to Nagpur in search of employment. They secured work in Nagpur, in a dam construction spot. They lived there for nearly 10 years. In the meantime she delivered five children. At the age of 17 years she delivered her first son. The delivery took place at home, without any ante-natal or natal care. The delivery was attended by local women. After delivery within 10 days she returned to her work. After two years she delivered her second son. This also took place at home without any medical care; she delivered all her five children with two years of birth interval each. Third and fifth children are daughters. She is ignorant about immunization and other MCH care. Except her last child, none of her children got immunization. The ignorance of preventive measures of diseases (immunization) made the life of her two children a hell. Her son has been affected by polio. He is totally handicapped. He is not able to walk, both his legs are affected, he can only crawl. This child is now 9 years. Recenlty they consulted Medical institutions and the doctors have advised them to take treatment but he has to be hospitalised and that is why they returned.

The condition of her fourth son is still worse who is now 5 years old. He is physically and mentally retarded. This child has been affected with polio at the age of 1 1/2 years. The parents are not taking any medical treatment. They feel that if they go to the hospital they cannot go for work and feed themselves and their children. They think these are all due to fate, nothing can be done. Hence the plight of these children are mainly due to the ignorance on the part of their parents coupled with the environmental conditions in which they live.

This picture of environmental hazards and ill health are not an isolated one, the condition among 75 per cent of the population, especially women and children who live in the rural and urban slums of our country are the same. They sacrifice their life in the face of environmental

degradation, illiteracy, ignorance and poverty. Hence it is high time to think about basic necessities in all the villages; at least water, latrines and primary education system. Though primary health care system has spread over the country, none of the people in remote villages are either aware of the services or realise the seriousness of their ill health. Primary health care may be strengthened further and the concept of health education and its promotion may be introduced on a war-footing. The primary health workers must change their approach and take measures to visit interior rural villages since these villages are also considered as their work area.

TOBACCO CONTROL ACTIVITIES IN KERALA

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Tobacco accounts for 30 lakhs of preventable deaths globally every year[1]. In India it is estimated that every year about 330 lakhs of people develop one or more tobacco related diseases, 6.3 lakhs die prematurally as a result of this[2]. Data published by the National Cancer Registry Programme shows that 52% of cancers in men and 18% cancers in women are caused by tobacco use[3]. It is estimated that 45% chronic obstructive lung diseases, 22% coronary heart disease, 18% strokes and a large number of peripheral vascular diseases are caused by tobacco consumption[4]. Inhailing the side stream smoke inadvertently from the cigarette of a person nearby is known as passive smoking. Exposure to passive smoking is an important health hazard as it can lead to most of the diseases caused by active smoking. Smoking by a pregnant women is harmful to the foetus and can lead to still birth or many perinatal diseases.

Tobacco is a major source for generating income by way of taxes for the Central and State Governments. About Rs. 30,000 millions were collected as taxes last year. But the paradox is that the Government had to spent approximately Rs. 6,800 millions more than the income collected for the diagnosis and treatement of tobacco related diseases, in a given year[5].

Tobacco is a habit forming substance. It is widely advertised. Therefore the teenagers get attracted to the tobacco habit and once they start using tobacco, as a result of addiction, they got hooked to the habit. The increase in the number of tobacco habitures in developing countries is due to several factors. There is an avalanche of attractive but untrue advertisements through electronic and print media which motivate highly the youngsters to take up smoking. No serious attempts are made to counter these advertisements and inform the truth that tobacco use in any form is injurious to helath and lead to great economic loss. The solitude in a nuclear family and high tension and competition of the modern life force the teenagers to try smoking, drinking or substance abuse. Though tobacco is a norcotic, there are no laws to effectively regulate the production, processing, transport, distribution or consumption of tobacco. More over, it is an accepted social behaviour in most parts of the country. People of Kerala are health conscious and literate, yet the tobacco habits are wide spread in the State.

Considering the above facts the Regional Cancer Centre, Trivandrum (RCCT) has identified tobacco control activities as one of the thrust areas and had conducted several anti-tobacco programmes [6,7,8,9]. RCC Trivandrum is one of the 10 Regional Cancer Centres in India sponsored by State and Central Governments. It offers comprehensive cancer care for about 35 millions spread over Kerala and two southern districts of Tamil Nadu. Tobacco control in a community can be achieved by a three pronged action-education, legislation and advocacy. In this paper an attempt is made to summarize the tobacco control activities of RCC Trivandrum for the period 1986 to 1994, in collaboration with the Governmental infrastructure and voluntary agencies in the State.

Education

The awareness about the hazards of tobacco consumption can be achieved through formal or informal education. The basic need before taking up helath education would be to generate and pretest appropriate health education materials. No helath education materiasl on tobacco were available at a time when RCC Trivandrum initiated the tobacco awareness programs. To fill up the lacuna the following health education materials were generated pretested and mass produced.

Table No.1: Health Education materials generated.

Books on tobacco	- 2 (10,000 and 3,000 copies each)
Brochures	- 3 (1 lakh, 30,00 and 15,000 each)
Display boards	- 12
Posters	- 5 (40,000 and 4 X 1000)
Stickers	- 6 (1 lakh, 4X100 and 1X3000)
Articles on tobacco through lay press.	- 8
Projection slide sets with Audio Casette and 40 slides	- 1 (35 sets)
Video films	- 2 (Duration 20 Mts and 11 Mts)
Broadcast through AIR	- 10(They were rebroadcast several times)
Telecast through DD and Asianet	- 6 (Retelecast many times)

During the formal education the awareness about tobacco can be created by teaching lessons on tobacco or giving the information though co-curricular activities. The educational authorities were requested to include lessons on tobacco in the formal education and these are being introduced when the text books are revised. To create tobacco awareness in the educational institutions Scout Masters, Guides Captains, Volunteers of the National Service Scheme, Teachers in-charge of Science Club, Headmasters and Talented students were identified as target groups. Trainings were given to these groups to conduct tobacco awareness programme in the schools and colleges and in the community.

Table No.2: Details of training of the target groups for tobacco awareness through co-curricular activities.

Scout Masters and Guide Captains(37 camps)	- 3476
NSS Volunteers (72 programmes)	- 3600 (Approx)
Talented students (4 programmes)	- 400
Teachers in-charge of Science Clubs	- 91
Headmasters of High Schools	- 63

The trained personnel conducted tobacco awareness meetings, held exhibitions, antitobacco ralies, included antitobacco themes for competitions in the youth festivals, spresd messages by distribution of brouchres, stickers and person to person communication, took oaths to avoid tobacco and identify with anti-tobacco movements and developed popular forms of arts to communicate with the low socio-economic groups.

To spread tobacco awareness through informal education, the following target groups were trained.

Table No.3: Details of training of target groups for tobacco awareness through informal education

Doctors	- 1597
Health Workers	- 2242
Nurses	- 2277
Dist.Mass Education Officers	- 42
Kely Trainers of Saksharatha Programmes	- 238
Volunteers of Village level cancer control programmes.	- 13928

The trained health personnel and key trainers of Saksharatha programme in turn trained small groups who work at the grass roots. The volunteers of the cancer control programme were communicating the message in small groups or in a person-to-person communication in the villages.

Evaluation of the educational activities were carried out. All professional groups were given pre-training and post-training evaluation. There was significant improvement in the post-training scores. 400 NSS Volunteers who actively participated in the anti-tobacco campaigns in 1988-89 were followed up after 5 years and their tobacco habits were compared with a matched control group from the same colleges without any tobacco-awareness exposure. Analysis showed a significantly lower number of youngsters who had tobacco-awareness became tobacco habituees compared to the untrained group. Baseline surveys of tobacco habits were taken in several villages with the help of helath workers and trained volunteers. The prevalence of tobacco habits in these areas where cancer control programmes are active will be studied after 5 years. Signed declaration forms stating individuals have given up tobacco habit are collected. These persons are intervied by letter to see whether they remain quitters or not after varying intervals.

Legislation:

There are several laws resticting smoking and other tobacco uses in cinema halls, public transport and some of the Govt. and private offices. However these laws are not rigidly implemented.

The Health Minister and members of the Legislative Assembly were requested from time to time to promolgate ordinances or take up legislative action to regulate tobacco use. An important outcome was a motion unanimously passed in the Legislative Assembly requesting the Parliament to go ahead with legislative action to ban tobacco use in public places. The Finance Minister was requested to hike taxes on tobacco and almost in each budget there was increase of tax on cigarettes. However, beedies and chewing tobacco had always escaped the Finance Minister's eyes.

Several private and govt. officers have made their offices Non-Smoking. The Southern Railway had introduced Non-Smoking coaches in the day time trains and comply with the general ban of restricting smoking in sleeper coaches. The Kerala State Transport Corporation seldom showed interest to implement the ban on smoking in public transport, so also the private buses playing in rural routes. In many rural cinema halls smoking goes on ad lib even now. A lot more are to be done to effectively regulate smoking and other forms of tobacco use by legislative action.

Advocacy:

It can be rightly sad that advocacy begins in ones heart. The tobacco habituees volunteers associating with the cancer control programmes were motivated to give up tobacco use before enrolling in the programme. They also agreed not to serve tobacco products during social functions in their families. Special occasions like world No-Tobacco Day are regularly observed by these groups with rallies and public meetings.

The Science Clubs in schools arranged tobacco awareness programme every year and some of them arranged exhibitions in the school in which hazards of tobacco are highlighted. The teachers in-charge of youth festivals were influenced to include anti-tobacco themes for competitions like cartooning, versifcation essay, elocution and short story writing. The advocacy from trained teachers and students through these co-curricular activities had resulted to look upon tobacco habit as alian behaviour at least within a few schools.

The Scouts and Guides organisation had involved all there members in Kerala State during 1994, in a project called "One Lakh Tobacco Free Homes". Each scout or Guide was asked to motivate a tobacco habituee relative or friend to give up tobacco use. The State Government had given Rs. 4 lakhs for this project. The evaluation of the project is underway. The media and public has recieved the project well and are giving publicity and support to this programme. The organisation has been awarded a State level award for their advocacy in tobacco awareness.

The Govt. of Kerala had agreed to give 20% of the money collected through the sale of Indira Vikas Pathras in a specific period for cancer control activities in the State, by lobbying the Government. A portion of this money is earmarked for health education. Tobacco awareness is an important area in the package for health education.

The RCC Trivandrum net work with other voluntary agencies like International Union for Health Promotion Education, Alcohol and Drugs Information Centre, Indian Redcross Society, Antinarcotic Council, Regional Cancer Association, Health Action by people etc and collaborate with them in observing No-Tobacco Days, arranging workshops and conferences in different parts of the State in creating an anti-tobacco lobby for direct action and advocacy to curtail tobacco use.

Comments:

Several tobacco control programmes are being organised in Kerala by the Govt. and voluntary agencies. The Government is keenly extending its support to compact tobacco menace. With

the co-operation of a helath conscious and educated population, the tobacco consumption in the State can be gradually and regularly reduced. There are several individuals and agencies who work actively and enthusiastically, but in an unco-ordinated manner. The Regional Cancer Centre, Trivandrum is willing continue to take leadership in co-ordinating, consolidating and evaluating tobacco control activities, retaining the individual identity of various groups.

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COMMUNITY PARTICIPATION AND MANAGEMENT IN ENVIRONMENTAL SANITATION PROGRAMMES

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Introduction:

In many places significant numbers of water supply points and sanitation systems are not operational since the community is not involved in the programme. Subsequently the planners and technicians were realised that many problems also arise because the consumers of these services, that is the local community, have not been sufficiently involved or even consulted in the design, implementation, management, operation and maintenance of their own water supply and sanitation facilities. Though drinking water and sanitation facilities have been increasingly provided in the community, there is substantial ignorance regarding how health is affected by unsafe drinking water and poor sanitation. The 44th round of National Sample Survey (1988/89) revealed that only about a tenth of the population in India were using both water and sanitation facilities. *The World Development Report 1992* makes an emphatic statement that **" investments in sanitation and water offer high economic, social and environmental returns".** However, these returns are realizable only with the effective utilisation of the facilities provided. It is in this context that the attempt to mobilise community or people's participation in water and sanitation programmes acquires vital importance.

Community involvement or participation has been used very frequently by many implementing organizations without realising the implications of such involvement in development programmes. Along with the International Drinking Water Supply and Sanitation Decade (IDWSSD), 1981-1990, global policies and approaches were suggested in the implementation of water supply and sanitation sector. Many countries including India adopted the goals of the IDWSSD and were committed to providing clean water and sanitation to all by the year 1990. In order to support the initiatives of Government of India multi-lateral and bilateral donors came forward with new integrated framework on water and sanitation projects. In Kerala the Netherlands and Denmark government's supported the water supply and sanitation programmes. Followed by this Socio-Economic Units (SEUs) have been established with Kerala Water Authority (KWA) in 1987/88 as part of the technical assistance component for mobilising, motivating and preparing the community in the planning, implementation, management and monitoring of the water supply and environmental sanitation programmes. In this paper an attempt has been made to review and analyse the experience of the Socio-Economic Units, Kerala while implementing the community based environmental sanitation programme.

Kerala Scenario:

In the environmental sanitation field, Kerala has historically an important place beginning in the 1950s. However, the state lacks a clear-cut strategy and management style to implement community-based sanitation programme. The low implementation rate of many of the sanitation programme in the States proves this further. The government departments, such as PHED, Rural Development and Health Services were entrusted with this responsibility but none of the departments were able to develop a community based, practical and continuing operational plan.

The main institutions involved in the provision of low-cost sanitation (latrines) in Kerala are : (1) Rural Development Department, (2) Municipalities, (3) Panchayats, (4) Department of Fisheries, (5) Housing, (6) Tribal Welfare, (7) Scheduled Caste, (8) Social Welfare, (9) Co-operative Bank, (10) Kerala Water Authority (11) the Socio-Economic Units in association with the KWA and governments of Netherlands and Denmark, (12) People's Action for Development PAD/CAPART Kerala through NGO's and women's organizations. The last three apparently have the largest completed construction efforts. However, no reliable data available on the magnitude of their operation, coverage, strategy followed and use of sanitation facilities constructed under various programme.

Even in a highly literate states like Kerala the situation is not as encouraging as it should be. There is a misconception among well educated Keralites and professionals that due to the high level of literacy, political consciousness and social awareness in Kerala, it is not necessary to carry out hygiene promotional activities on the proper use and maintenance of water and sanitation facilities. However, the experience with the environmental sanitation programme and other similar programmes reveal that many Keralites are not different from others in using and maintaining latrines and public places. The other dimension is that many persons associated with development programmes working in other parts and outside the States think that in Kerala every thing works well, due to high literacy rate, female education and other positive social and economic development. But in reality this is not at all true. In Kerala, it is difficult to implement any developmental programmes due to high political consciousness and unnecessary interference and involvement of political leaders and the labour force. Like the other states in Kerala also the privileged communities still expect every thing free and this has been largely reflected in the water and sanitation sector also. In a nut shell working in a sophisticated and literate society is as difficult as in working in a simple and illiterate society. It will not be a difficult task to convince an illiterate person and elucidate his/her confidence and cooperation in a drinking water and sanitation programme without much difficulty in any part of the world.

The SEU has a three level functional structure. At the headquarters the tasks of project planning, co-ordination, support and monitoring undertaken by a small professional team. In the field, the main functions are implementation and co-ordination. Co-ordination with other agencies, including the government, in matters of sanitation, health and education is an equally important component of the programme at this level. At the third level (at panchayat level) the temporary field organiser is working together with the Water Committees, Standpost Caretakers and the Community where the project is being implemented.

Development of community management

The Ward Water Committee (WWC) is the basic community organisation structure at the local level. This Committee is a voluntary group of seven people identified by the residents of the locality. The composition of WWCs is given below:

- elected ward member
- 2 women representative
- 2 youth representative
- 1 active social worker/ or local school teacher
- 1 representative of Social Welfare/health/rural development

It is important to note that this composition ensures that all active groups, all points of view and all, local political interests/parties are represented. The secretary of the Ward Water Committee is usually identified from the seven members. The elected ward member would be the Chairman. This is an unpaid community-based group organising and implementing water and sanitation in the ward. The latrine-with education programme is not the only activity of the Ward Water Committee. In addition to the sanitation programme, the Ward Water Committee is also active in other water-related programmes for piped water systems, chlorination of wells, environmental sanitation, and so on.

At the local level, the management of the sanitation activities during planning and implementation is largely in the hands of the Panchayat (Local government) and the Ward Water Committees. The SEUs play a catalytic role in motivating the Panchayats, Ward Water Committees and households to undertake environmental hygiene improvements and take up local management roles. The programme has three components, of which construction of improved facilities (domestic and school latrines, soak-pits, drainage channels) is only one. The three elements are : community and household motivation and participation, education/communication for improved sanitation and, lastly construction. Each element is equally important. The local implementation strategy emphasizes community leadership and responsibility for progress and results. To build management capacities, training and planning activities are held for the Ward Water Committees and the panchayat officials involved in the programme.

The community sanitation programme in each panchayat is based on a written contract, in which the Panchayat and other signatory groups (Executive Officers, Ward Water Committees) agree to manage and implement the programme according to certain procedures, with the Socio-Economic Units giving assistance and training. The construction of demonstration latrines in two or three key localities would be the last step before preparing the formal agreement for signatures.

Each panchayat contributes financially (approximately 15-20% of their annual income) to the programme on an voluntary basis. The amounts range from Rs.25000 to as much as 5 lakh rupees. In most cases, the panchayat contribution is used to provide latrines to the very poorest people at the end of the standard construction period.

Strategy and methodology adopted:

Pilot Programme:

Right from the beginning, and even more so after the study of pilot experiences and of a large number of other sanitation programmes in the state, the SEUs and Coordinating Office developing the programme concluded that another approach than usual was required to do all of the above in a cost-effective way, on as a large a scale and in as short a time as possible. Faced with the challenge of constructing large numbers of latrines (currently the goal is approximately 50,000), it was not obvious which management and administrative strategies should be developed, particularly the institutional linkages. The only answer the group could see to the question of how to provide effective sanitation to larger numbers lay in the mobilisation of already present organisational resources. To put it differently: not to do every thing themselves, but to collaborate closely with and work through local institutions and community organizations.

The challenge, as defined in 1989, was to provide as many households as possible with proper sanitation but in such a way that the beneficiaries understand and appreciate the facility and will use it properly. This meant, in practical terms, not only construction but mobilization and motivation of the beneficiaries; arranging for involvement of local groups and, finally, construction of technically sound latrines at low cost. The given latrine design was the double pit pour-flush latrine with squatting pan of steep gradient and trap with a 20 mm water seal. In so far as the most programmes in Kerala include a complete superstructure, this was also included in the programme. The major challenge then, was not technical, but was managerial and administrative.

Therefore, it was decided to have three pilot programmes to try out different institutional arrangements for implementation of the programme. The three programmes which were carried out in 1989 compared planning and implementation with:

- voluntary and semi-governmental institutions (three different institutions with sufficient experience and manpower to manage and construct 500 latrines each in three different panchayats);
- through the panchayat (local government) and voluntary Ward Water Committee. The Ward Water Committee includes members of active local institutions such as the Health Department, ICDS, schools, youth and women's organizations (tried out in two panchayats, 500 latrines each);
- by the Socio-Economic Units directly (two panchayats, 500 to 1,000 latrines each).

In all cases, the double-pit, pour flush latrine was built with superstructure having 20% financial contribution from beneficiary plus digging of pit. This is a poverty-oriented programme. All beneficiary families were to be below the poverty line, with selection based on certain commonly-agreed criteria.

Based on the experience of the pilot programme and the outcome of the evaluation study conducted by the Gandhigram Institute of Rural Health and Family Welfare, Tamil Nadu, it was possible to develop a strategy for the implementation of the sanitation programme with the active participation and involvement of the organizations and people in the panchayats. The educational input is available for all the residents in the locality where the programme is in operation. The two objectives of the programme formulated during this stage were:

-Full latrine coverage and use **by the poorer households with the program only giving direct assistance to the poor** in the participating Panchayats;

-Measurably improved sanitation habits in all households which installed latrines, and in schools and at public water-points.

These objectives were based on the fact that sanitary latrines for each family are not only an individual/family need, but a condition for an impact on public health. Without universality of sanitary improvements by all households as well as elimination of key environmental sanitation risks in public places no health impact is possible.

Comparing the outcomes of these three pilot programmes demonstrated the importance of education, community mobilization and follow-up. The pilot programme carried out through the local government with Ward Water Communities proved most satisfactory. The work of the voluntary and semi-governmental institutions was weaker in education and in obtaining commitment of the families and community. The work directly implemented by the Socio-Economic Units requires a level of manpower that could probably not be sustained in a larger programme.

The pilot experience also showed the need for adequate time (at least 3 months) before implementation of education and mobilization activities; need to involve health department staff and members of other institutions active locally; the need for follow-up monitoring for at least a year after construction. This has become the model for the programme that is currently being implemented. Provision of effective sanitation for larger number of families requires mobilization of already present organizational resources - not to do every thing ourselves but to work through local institutions. The best way to mobilize these is through the panchayat, the Ward Water Committee and the Socio-Economic Units working together.

Current Programme:

The programme has three components, of which construction is only one. The main elements of the programme are community and beneficiary motivation and participation, education / communication for improved sanitation and, lastly, construction. Each of these three elements is described briefly below, followed by a detailed description of the various steps in the programme.

In terms of community and beneficiary participation the programme is carried out by the panchayat, the Ward Water Committee and community working together with the SEUs. The

strategy emphasizes community leadership and responsibility for implementation. The various groups involved in the programme are described below:

a) The strategy of the programme is based on a written contract in which the panchayat and the groups noted below agree to manage and implement the programme following certain procedures, together with the Socio-Economic Units. Each panchayat also contributes, on a voluntary basis, for this programme. The amounts range from as little as Rs.500 to as much as 5 lakh rupees. In most cases the panchayat contribution is used to provide latrines to the very poorest people at the end of the standard construction period. However, the contribution must be deposited in a bank account, jointly operated by the panchayat and Socio-Economic Unit before the programme can begin.

b) An implementation committee looks after the day- to- day affairs of the programmes (including constructions and education activities). The Implementation committee members are: the Panchayat President, Executive Officer, an SEU Official, one lady member (elected by all the WWC members or the women WWC members). The Ward Member from the ward where programme implementation is ongoing, is a special invitee to the Implementation committee. The Executive Officer is responsible for keeping the accounts for this programme. These accounts are checked periodically by the accounts officer from the Socio-Economic Units and are subject to an occasional audit check by an external auditor.

There is an important education/communication component which is meant to be continuous and community-based. By and large the community education component had addressed the following issues:

- How can people be successfully motivated to adopt hygienic practices such as hand washing?
- How can hands be washed adequately with minimum water and soap?
- What are the usual local behavioral practices and their trend?

For example there is a common belief that children's faeces are 'harmless'. They are often more infectious than adult excreta and can contaminate if they are left in the yard thrown on a nearby garbage heap or if soiled baby clothing are washed along with dishes. Some families mentioned that the latrine would be of great help especially incase of women who have to go either early or late in the evening to defecate or be beneficial to the women during the menstruation period and be beneficial to the sick or old people.

The Education and communication activities occur at regular intervals which is given below:

-There is a 3 to 6 month general mobilization, with a range of activities such as group meetings, exhibitions, camps, street drama. This is meant to build up demand, inform people about the health aspects of latrines in general.

-Specific training for masons in construction and about imparting health/sanitation messages to the families.

-Three classes for beneficiaries each targeted on a specific topic (health, technical aspects, use and maintenance)

-Training and planning activities for the Ward Water Committees and relevant panchayat officials involved in the programme.

-Follow-up monitoring by the Ward Water Committees and other local groups.

With respect to construction, the target for this programme was 50% of the below poverty-line households. Now it has been decided to cover 100% of the below poverty line population. On basic latrine model is made, with variations taking into accounts local conditions and availability of materials. This is the double-pit, pour flush latrine, with a complete superstructure except in one panchayat. As of November 1994, the cost of each Unit average ranges for Rs.2000 to Rs.2500 (except in water-logged areas where costs are higher). The price is different in each panchayat depending on the cost of local materials and labour. Costs are carefully set through the construction of demonstration latrines at the beginning of work in each panchayat. Maximum use is made of locally available materials and local masons for each programme. It is important to keep down the costs because poor families can not afford large contributions (calculated at 20% of construction costs plus digging pits). It is also important to reduce costs in order to stretch our existing resources as far as possible.

In addition to the construction costs, there are overhead charges which include costs of the initial motivation campaigns, staff salaries and transportation. The total overhead charges are estimated to range from Rs.200 to Rs.250 per latrine (per capita cost is still below Rs.50) constructed. These costs are relatively lower than in many other programmes because of the high level of community involvement and the special effort to find the lowest cost for construction using local materials.

Criteria for selection of households:

For providing the facilities to the most deserving groups strict criteria measures has been introduced and these were followed by the water committees and the implementation committee.

- Families below poverty line currently defined as those with a monthly income of below Rs.1100/-;
- Beneficiary should express keenness to own a latrine and participate in all the health education activities;
- There should be adequate water to maintain the sanitary latrine;

- There should be sufficient place to construct a two pit latrine without causing any problems to sources of drinking water and other households;

- There should be a minimum distance of 10 meters between the latrine pits and existing drinking water sources;

- Households to be given priority are: (a) headed by disabled or handicapped; (b) headed by widows (c) families with large number of female children (d) scheduled castes or tribes not already served by other sanitation programmes;

- Land to construct the latrine and house should be owned by the beneficiary;

- The total beneficiary contribution is 25%. This is usually equivalent to the digging of the pits plus 20% financial contribution. Beneficiary should dig the pits. The beneficiaries and the WWC are responsible for local transport of materials;

- If other criteria are needed for beneficiary selection, the following should apply:--- huts and colonies;-- owning less than 5 cents of land; -- number of economically active people in the household.

After the Ward Water Committee has done the selection, a check is made by the Field Organizer who works for the Socio-Economic Units. The list of beneficiaries is also displayed in the panchayat building, PHCs and other public places so that anyone can raise questions.

Steps in implementation for each panchayat

1. **Identification and selection of Panchayat**: activities will normally be undertaken two wards at a time to allow for more efficient construction work. The education programme may work in more wards at the beginning.

2. **Panchayat/WWC training**: to brief panchayat about details of the programme, cost, technology, beneficiary participation, role of each committee- hygiene education and how to submit the panchayat proposal and contribution etc.

3. **Data collection/survey by Panchayat**: Collect data on all panchayats. Information on the existing type of latrines, households do not have latrines, water availability, active institutions working in the area, revenue of the panchayat etc will be gathered and use this data for planning the programme in each panchayat.

4. **Construct model latrines, masons training and costing of latrines**: This should be constructed in each panchayat to determine the exact costing for that panchayat. Check carefully labour costs during this construction. The demonstration latrines should be built for the ICDS, health clinic. for example. In some cases the SEU will decide to do

two constructions: one for the demonstration latrines and another to arrive at the costing.

In many cases the construction is also a time when local masons are trained. They will be active in the rest of the programme.

The costing of the latrine in this way determines how much subsidy will be given for each latrine in that panchayat. It also determines how much the beneficiary will have to contribute (20% of the price of construction). The SEU therefore try to cut down the cost at this point for each panchayat, using locally available materials.

5. **Panchayat agreement, plan formation of implementation committee:** An implementation committee comprising of Panchayat President, Executive Officer, KWA Assistant Engineer and SEU Official, one lady member (not necessarily an elected representative) from PWC will look after the day-to-day affairs.

   Resolution to be taken by the panchayat and submitted to SEU. The panchayat and Socio-Economic Unit opens a joint bank account (joint signature by Executive Officer and Programme Officer). The Panchayat contribution is first be deposited before the Socio-Economic Unit deposit (amounting to 75% of the construction cost plus 1% overhead). Agreement with panchayat must be completed and signed.

6. **Mobilisation, Campaigns and hygiene education:** This will be carried out by WWC together with existing local agencies such as ICDS and PHC for at least 3 months. Ward Water Committee is in charge of general implementation of the programme which includes the health education activities.

7. **Beneficiary Selection and Contribution:** The forms provided by the WWC are scrutinised and verified to ascertain eligibility. The list will be displayed in different parts of wards for public comments. The list must then be scrutinized and approved by Panchayat Water Committee.

   20% of the cost of the latrine has to be borne by the beneficiary. Other responsibilities of beneficiaries are: preparing two pits of appropriate size, transporting materials from the main road or store house to the site, assisting the helper etc. A separate register has to be maintained in the panchayat beneficiary.

   During this time the education meetings are held for beneficiaries.

   WWC will be responsible for motivating beneficiaries to, pay the contribution. This can be deposited in instalments, or in lump sum at the panchayat.

8. **Education on technical and health aspects:** Householders must attend 3 educational meetings before construction can begin. During this time the following topics will be covered: need for a latrine, health education and sanitation topics, use and maintenance

of a latrine, responsibilities of householders, amount and mode of remittance of contribution. Give and explain work sheet, introduction of technology, water seal, junction box, householder participation and so on (2-3 months). A description of the education programme and a sample worksheet are shown later. Staff from other departments such as health, rural development or ICDS should be oriented to take up health education programme in the long run.

9. **Pit Marking and Pit Digging**: Marking on ground is done by a technical person/health inspector and trained WWC members. Beneficiary digs the pit according to the dimensions explained by the technical person or Ward Water Committee member.

10. **Purchase and construction:** For convenience, construction could begin in two or three wards. Quality of construction has to be periodically inspected by the Sanitation Supervisor. SEU staff should in any case make spot checks of construction period. The report of the periodic and spot checking should be given to the Implementation committee. Intense health education activity (4-5 months) to begin at this stage. Also emphasize the role of mason/trained water committee member as agents of hygiene education in individual beneficiary houses.

    Implementation committee decides on sources of procurement. Printed voucher are used for all purchases. Voucher is approved by sanitation supervisor and countersigned by ward member. Separate cash book for all remittances and withdrawals are maintained in the panchayat. It is the responsibility of the Ward Water Committee to see that transportation of materials is done by beneficiaries as a group.

    Sanitation Supervisor has to submit weekly report of progress and monthly accounts Field Organizer/SEU official to make fortnightly visits. Each sanitation unit must have a serial number. SEU to maintain list of these. Specific procedures and forms or vouchers for purchase, accounts, and supervision are used.

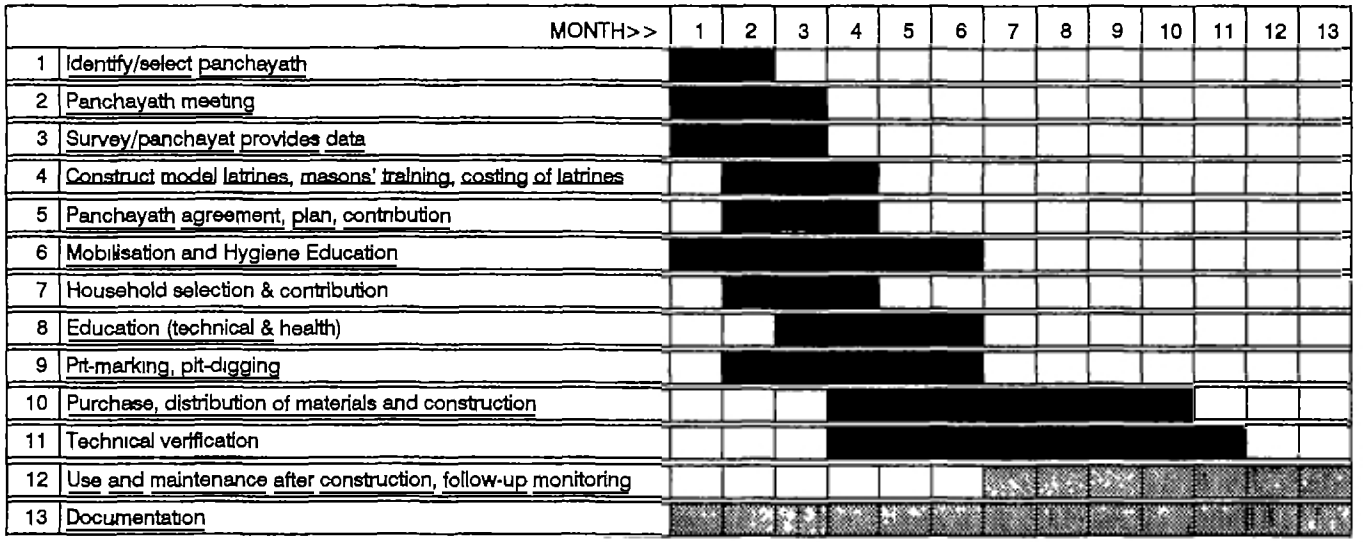
11. **Technical Verification of Units:** SEU personnel and representative from Panchayat or health department certifies fitness.

12. **Use and Maintenance after construction and follow-up monitoring**: Guidelines on use and upkeep of latrines are given to each family once again in small group meetings. These are conducted by Ward Water Committee. Also at this stage, a booklet/leaflet or instruction in use and often a brush to clean are provided. Emphasis is given to the following:

    - Children and men should use latrines
    - Washing hands with soap/ash after defecation
    - maintaining water seal
    - preventing blockage
    - keeping surroundings and latrine clean

LATRINE-WITH-EDUCATION PROGRAMME SUPPORTED BY SOCIO-ECONOMIC UNITS, KERALA

STEPS AND TIME PERIOD FOR IMPLEMENTATION FOR EACH PANCHAYAT



Ward Water Committee conducts periodic monitoring and follow-up of the latrine.

13. **Documentation:** For each panchayat, the following information should be available, kept in one file for each panchayat:

(1) Panchayat contract and proposal

(2) -**wards** in which work undertaken and dates of beginning construction in each ward. **Number of latrines** to be constructed in each ward. Confirmation that these were constructed.

(3) - register of household contribution (panchayat). Name, address of house, amount paid, application forms or pertinent information and serial number of latrines.

(4) -**accounts:** Register of accounts for programme. Accounts for each panchayat covering their contribution and the SEU contribution must be available. This will be subject to an external audit.

(5) -**education:** For each Panchayat, note any unusual things about the education programme (new topics covered that are not usually covered, problems, good things that happened--be specific). List other SEU education/project activities on-going.

-**Follow-up** include all data collected in follow-up which relate to use of latrines, household sanitation, quality of construction, defects in the materials used in construction, and so on.

Community monitoring & follow up:

Although, the concept of environmental cleanliness and purity of water are not unfamiliar to the people of Kerala, there is a strong need to strengthen the hygiene education component in water supply and environmental sanitation programmes. A major vehicle for the carriage of messages is the Ward Water Committee. Participatory training methodology has been used effectively in every stage of the programme. It is easy to make changes in technological aspects but making appropriate changes in attitudinal and behavioral practices is a very difficult task which have to be developed over a period of time. This involves more than simply explaining the importance of hygiene education to the people. Local women groups are selected to form neighbourhood committees and are trained to implement effective hygiene education programmes. Perception and knowledge of the community regarding water and sanitation is crucial before carrying out the programme. It is important to gain insights into the life style and living patterns of the community. Our experience proves that literacy is not having a significant role in the adoption of healthy and hygienic behavioral practices.

Every six months the use and maintenance of the latrine is monitored by the representative of the ward water committee and the format used is given in appendix - 1. The findings from

the monitoring data has been used for planning the hygiene promotional programmes at the ward and panchayat level. It might be interesting to note from the monitoring data (an example is given in appendix - 2) that the effective use of latrines were above 97%. In all the panchayats more than 90% of the children were found to be continue to use latrines, 98% of the users were aware of the water seal and to maintain the water seal.

Summary & Conclusion:

As indicated above, it is imperative that while planning and implementing water supply and environmental sanitation programmes people have to be consulted and involved in each stage of the activity. This will help a great deal in identifying and solving problems connected to selection of sites for public tap/ latrines, arranging cost recovery, organising effective operation and management, and increased use and maintenance of facilities. In the community mobilisation & motivation, monitoring and evaluation, people's participation is quite vital and the crucial element is the designation of appropriate community development workers or organised ward water committees as "change agents" to work with communities before, during and after the planning and installation of any improved system. There is an urgent need to review and study the experience of ongoing integrated water and environmental sanitation programmes implemented by various groups in this country for developing an effective and sustainable low cost water and sanitation programme for improving the quality of life.

Special efforts have been made for problem solving in an area with maximum involvement of the community group and systematically use them to assess their own problems, analyse the problems and identify possible solutions and act to marshal the resources necessary to implement those solutions. More important, they must learn to reassess the results of their actions, reanalyse the solutions and modify their actions on a regular basis. It is worthwhile noting that the SEU programme has succeeded in fostering more inter-sectoral co-operation and co-ordination between government departments and voluntary organizations. There has been considerable progress in this respect over the past years, and, drawing lessons from these experiences, we have incorporated new approaches and corrective measures while planning the activities for the future. As explained earlier, the sanitation programme has attracted interest from many places and this is the only programme in Kerala where the local body is contributing for extending the coverage in the area. Due to consistent commitment and enthusiasm of the community, it is possible to provide quality latrines with minimum cost. The below poverty line householders were able to contribute 25% of their share before starting the programme. More and more households are coming forward (mainly middle income community) for a sanitary latrine and they are willing to contribute 75% or even up to 100% of the cost. The unit cost of a latrine is lesser than other programmes in Kerala. Beneficiaries are very satisfied with the performance and the quality of construction. They are aware of the functions of the junction box and the need for changing pits every two years. The usage rate and the number of children using such facilities are much more than the other sanitation programme implemented in Kerala . More over, the sanitation programme has influenced the political leaders and people from all walks of life and it has been promoted as a people's programme through out the State. However, at the media level the effect and the influence of the programme and the magnitude of community initiatives has not been projected in a visualised manner. In short, the approach and

strategy in human capacity building of this programme would be very useful for the effective implementation of Panchayati-raj system at the panchayat and ward level. The trained Ward Water Committee members would be able to guide, support and facilitate the implementation of decentralised social development programmes in Kerala.

APPENDIX -I

MONITORING FORMAT

Monitoring format for use and maintenance of latrines

1. Panchayat .....

2. Ward No. ..... 3. House No. .....

4. Latrine No. ..... 5. Date of latrine built .....

6. Number persons in house .....

No. of persons using the latrine.....

7. Condition of Pan & trap:

a. Cleanliness good (without faeces sand, mud, etc.)	No	Yes
b. Does latrine flush well? (If not, check Junction Box/pit)	No	Yes
c. Foul smell	No	Yes
d. Yellow colour	No	Yes
e. S cratches or breakage in the pan	No	Yes

8. Behavioral practices:

a. Water kept inside	No	Yes
b. Water kept outside	No	Yes
c. Soap kept nearby	No	Yes
d. Availability of brush	No	Yes
e. Use by children above 3 years (ask a child, if possible)	No	Yes

9. Check whether the person is aware of the purpose of water seal — No Yes

10. Is the waterseal visible or clean — No Yes

11. If latrine is more than 2 years in use ask did you change the pit — No Yes

    If yes indicate the date .....

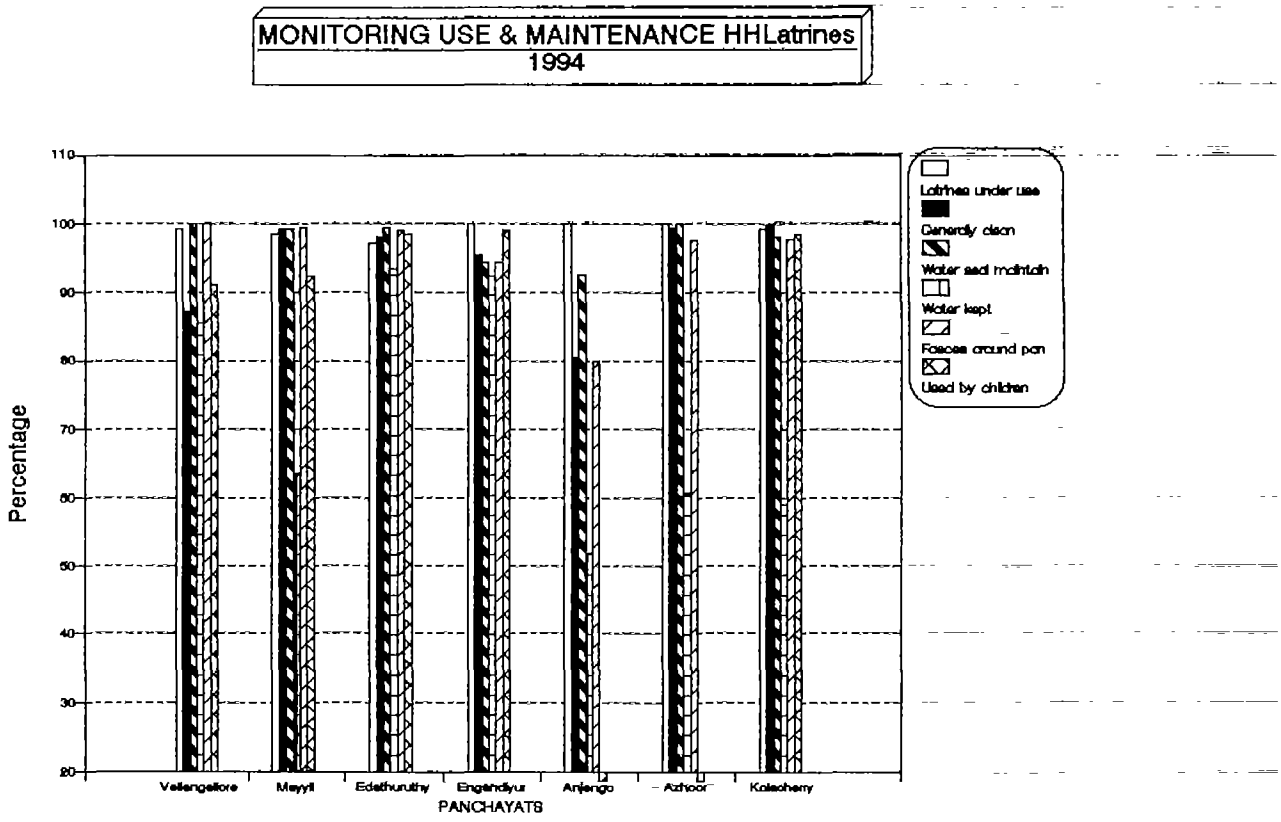
12. Check whether person is aware of the purpose of junction box — No Yes

Date .....

Name & Signature

Monitor .....

APPENDIX -II


MONITORING USE & MAINTENANCE HHLatrines
1994
Percentage
110
100
90
80
70
60
50
40
30
20
Vellengallore
Mayyil
Edathuruthy
Elgandiyur
Anjengo
Azhoor
Kolacheny
PANCHAYATS
Latrines under use
Generally clean
Water seal maintain
Water kept
Faeces around pan
Used by children

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THE EFFECTIVENESS OF COMMUNITY PARTICIPATION AND HYGIENE EDUCATION IN THE PLANNING AND MANAGEMENT OF LOW COST SANITATION PROGRAMMES IN KERALA

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This paper gives a bird's eyeview on our experience with the community in the three key aspects of environmental sanitation programme. They are,

I. The Hygiene Education and Promotion Stages adopted to sensitize the community and the households on sanitation and hygiene issues and also to sustain the positive changes with a goal of total sanitation in the Panchayaths.

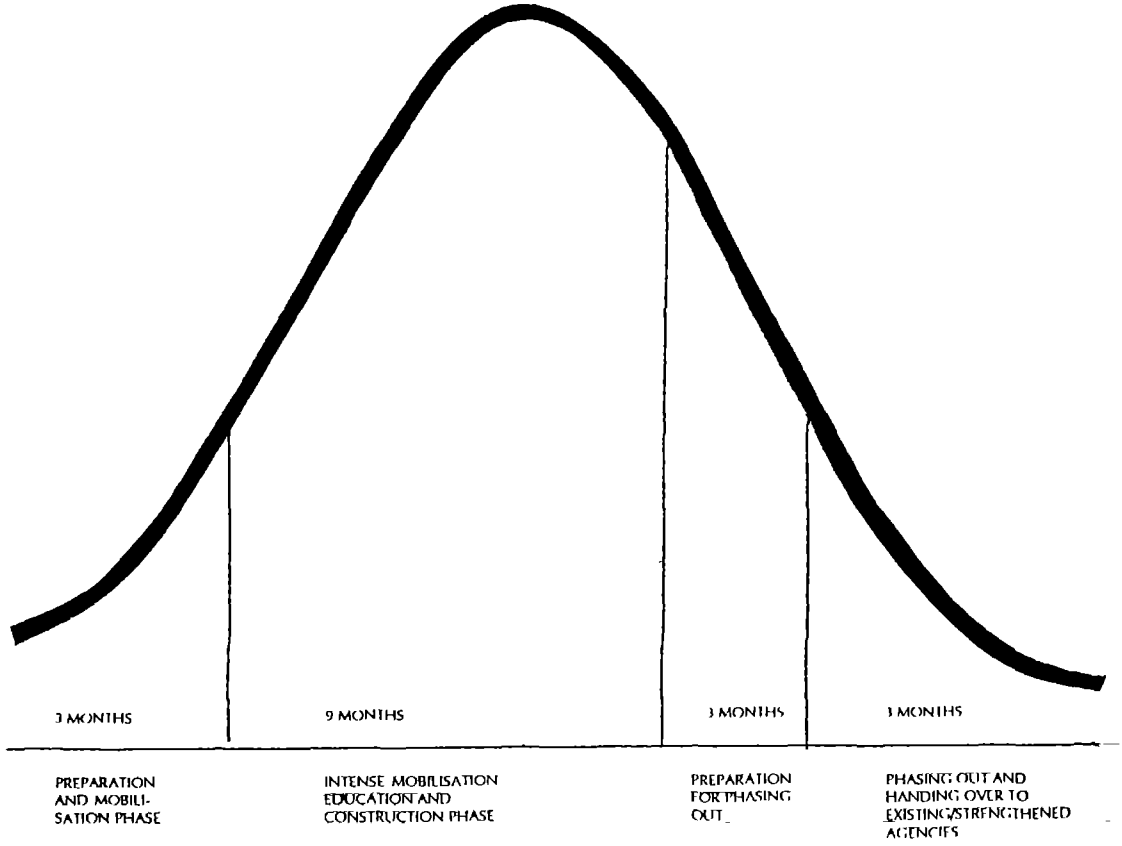
II. A picture of extended coverage of sanitation programme in one of the Grama Panchayats through self motivation of the households after SEU intervention.

III. Certain monitoring indicators which have thrown lights on sustainable and effective use of latrines.

I. The Hygiene Education and Promotion Stages

Sensitizing the community is the first step in any sanitation programme. A very good team effort of all the concerned persons, the beneficiaries promoters, neighbours, other related department officials, and the community as a whole is a sin qua non in achieving whole hearted participation and sustainability, Generally an 18 months strategy is followed in each panchayath. (Please see fig 1). This comprises of an initial preparation and mobilisation phase of 3 months followed by an intense mobilisation and education phase of 9 months. After this, there is a gradual withdrawal with preparation of phasing out in the next three months. During this period, the local groups identified earlier during the preliminary phase would be trained and sufficiently strengthened to shoulder responsibilities to manage the programme on their own. During the last three months, inputs required if any, would be assessed and the programme would be handed over to them. Regular monitoring, extending the coverage, motivating the panchayath to include the sanitation in their budget item, helping the poorest of the poor through sponsers and taking up regular sanitation programmes in the ward all form part of the job responsibilities of these strengthened groups. They are termed as the Ward Water (Sanitation) Committees (WWCs), pure voluntary group comprised of social workers and opinion leaders including women.

Fig. 1.
MODEL: HYGIENE EDUCATION IMPLEMENTATION CHART 18 MONTHS



II.The Extended Coverage of Sanitation Programme in one of the Grama Panchayat, through self motivation

Having sensitized the community and the households to own a sanitary latrine and having constructed 700 - 800 units, an effort was made to study the coverage in two of the 15 panchayaths where low cost sanitation programmes were in full swing. The present case is of one of these Panchayaths, viz, Kolacherry Grama Panchayath of Kannur District, Kerala State.

Table 1 SOME BASELINE INFORMATION ABOUT THE PANCHAYAT

Name of Panchayat	Area in Sq.Kms	Population 1991	No. of households	Average family size
Kolacherry	20.7	22346	3246	69

Table 2 STATUS OF SANITARY LATRINES BEFORE AND AFTER SEU INTERVENTION (See fig. 1 also)

Households without sanitary latrine before SEU intervention	2337	(72%)
No. of households below poverty line	1947	(60%)
After SEU Intervention		
No.of Sanitary latrines (S.L) constructed with people's participation and education.	812	(25%)
No. of S.L. under different stages of implementation	450	(14%)
No.of Units constructed by self motivation	786	(24%)
No.of units planned to be constructed by the Panchayath in the next three years under differential subsidy pattern through the WWC	270	(08%)
Balance to be covered	19	(0.6%)

The Socio-Economic Unit was determined to motivate the community and the panchayat towards achieving a total sanitation goal. Various strategies were discussed, various plans formulated and implemented and the result was incredible. It was proved that nothing was impossibile. While open air defecation was the only habitual way of disposal of human waste in this hilly area, it is a thing of the past now. The Panchayat has also made it mandatory to construct new houses only with sanitary latrines.

How was this possible?

The SEU acted as a facilitator both for the panchayat and for the householders. It contributed 50% of the total expenditure, the rest was to be met by the panchayat and the householders.

A few motivated householders started to roll the stone. Their wives persuaded their husbands, their teenage girls pleaded and their children demanded and they became the proud owners of sanitary latrines. They altogether acquired a commendable life style. Their teenage girls had no longer to wait until dusk to fulfill their primary needs. Their children were no longer seen sitting near the courtyard answering nature's call. Their neighbours frowned at them in envy. They silently wished for their own toilet facilites. Some of them visited their wiser friend's toilets. They shared their toilets during emergencies. The low cost twin pit pour flush latrine thus became the talk of this village among daily wage earners, women quarry workers and housewives.

Every latrine owner had directly or indirectly motivated two of his neighbours to own a sanitary latrine. Among them were, the wealthy and the disabled, the conservatives and the modern, the women headed families and the handicapped.

To find out the various factors and conditions that helped to achieve such a high coverage by self motivation an attempt was made to go a little deeper. Through interviews with selected questions some interesting informations were collected, which are being shared here.

Figure 2 and Table 2 give the status of household saniary latrine coverage. 786 latrines (24%) were built by the householders by self motivation. No financial aid was given either from the Panchayat or from the SEU for this group. The effort is still continuing with the aim of total sanitation coverage by 1995.

An effort was also made to study the self motivating factors of this group. (Please see fig.3, table 3). While 39% had given increased awareness on health issues as the primary factor, 25% were persuaded by the WWCs, and 21% were motivated by neighbours. Only 15% had stated lack of space as their motivating factor.

Table 3. SELF MOTIVATING FACTORS

FACTORS	NO. OF HOUSEHOLDS	%
Increased awareness on Health issues	307	39
Persuaded by WWC	196	25
More information on latrine through neighbours and others	165	21
Lack of space	118	15
TOTAL	786	100

The group was studied on the basis of educational status of the lady of the household also. (Please see Table 4)

Table 4. EDUCATIONAL STATUS OF THE LADY OF THE HOUSEHOLD

Illiterate	27.2%
Below Lower Primary (IV STD)	35.4%
Below Upper Primary (VII STD)	25.3%
High School	11.0%
College Education	01%

Only 11 of them had High School education and 1% had College education in this group. 27% were illiterate and 35% were at Lower Primary level. 25% studied upto STD VII.

Table 5. RELIGIONWISE DISTRIBUTION OF THE HOUSEHOLD

Hindu	58.51%
Muslims	41.45%
Christian	0.04%

Table 5 gives Religionwise distribution of these households. 58.5% were Hindus and 41.5% were Muslims. The rest (0.04%) were Christians.

Table 6. SIZE OF FAMILY

No. of Members	% of Households
1 - 3	10.0
4 - 6	42.5
7 - 9	28.6
10 - 12	10.9
12 +	08.0

Table 6 is on the Family size. 10% had 1-3 member family, 42.5% had 4-6 member family, 28.6% had 7-9 member family, 10.9 % had 10-12 member family and 8% had 12 member family.

Table 7. GENERAL SOCIO ECONOMIC STATUS

Very Weak	9.7%	Below 500	62%
Weak	50.5%	501 - 1000	17%
Middle	25.5%	1001 - 2000	15%
High	14.3%	2000 +	06%

Table 7 gives the Socio economic status of the households. Generally it would appear that the self motivated households who did not receive any financial assistance from the Panchayat/ other agency could be from well-off households. But the table gives a different picture altogether. Only 6% were under Rs.2000 + category, and 15% under Rs.1001 - 2000 category. The rest were having income below Rs.1000. Similarly, by assessing the house and other socio economic assets in the family, it was observed that 60% were under weak category and only 40% belonged to middle income group and above.

Table 8. ANALYSIS ON THE BASIS OF OCCUPATION

Coolie	64.4%
Government jobs	7.6%
No gainful occupation	2.5%
others (Business, traditional jobs etc)	25.5%

Table 8 gives analysis on the basis of occupation. 64.4% were daily wage earners (Coolies), 7.6% had Government jobs, 2.5.% had no gainful occupation and 25.5.% were engaged in various business ventures including traditional jobs like weaving etc. 97% had no other source of income (Table 9).

Table 9. OTHER SOURCES OF INCOME

Yes	3%
No	97%

Table 10. COST INCURRED BY THE HOUSEHOLDERS

RANGE	NO.OF HH	%	% OUT OF PANCHAYATH
Below Rs.5000	102	(13)	03.0
5000 - 7000	535	(68)	16.5
Above 7500	149	(19)	04.5

Table 10 gives the cost incurred by the householders. For 13%, the cost was below Rs.5000/ for 68% it came between Rs.5000 + Rs.7000 and for 19% it came above Rs.7500/-. A significant factor to be noted here is that when the construction is on a collective endeavour, the cost is much less compared to individual construction. The difference noted range from Rs.1000 to 2000 percent. Additional transportation, high cost of material and labour could be the reasons for higher cost. When the community purchases and the material and contracts the labour through their Implementation Committee there is bargain for lowest quotation both for material and labour as it is bulk purchase and longer period of work.

Table 11. TYPES OF UNITS CONSTRUCTED

TYPE OF UNIT	NO.OF HH	% OF HH
Single leach pit	660	84
Septic tank	21	02.6
Twin Leach pit	105	13.4
Total	786	100

Table 11 gives the types of units constructed. 84% constructed single leach pit, 13.4% constructed twin leach pit and 2.6% constructed septic tank type.

Having studied the various aspects of these self motivated housholders, it is to be presumed that

times are not far off when the relatives and friends from the neighbouring and far off panchayaths after visiting their proud latrine owner friends would act as messengers to motivate themselves and others and would pave way for a total sanitation revolution in the years to come.

Besides the household sanitation programme, this panchayat has come in the forefront by constructing urinals/toilets for all the schools with 50% PTA contribution from the schools out of the 10 schools in the panchayaths, two have their own facilities, 8 are engaged in constructing urinals/toilets and it is expected to complete during this academic year itself. Thus the goal of total sanitation is not at all a dream now but a crystal clear reality and an eye opener to many similar Grama Panchayaths.

III .Certain monitoring indicators which have thrown lights on sustainable and effective use of household latrines.

The SEU wish to show some information on latrine monitoring also as otherwise, the programme would appear half complete. As given earlier, the WWC does the regular monitoring of latrines. However, once in every six months, an outside agency is entrusted to monitor the latrines. This is done for a period of two years and is done through observation as well as through interview with the help of a questionnaire prepared based on Minimum Evaluation Procedure (MEP) by the WHO. The monitoring indicators are mainly on sustainable use, effective use and optimum use with focus on functionality, utility and impact.

Table 12 gives monitoring data from 1988 to 1992 for one panchayat where SEU had started its Pilot Sanitation Programme. From 1990 onwards SEU withdrew its activities after entrusting the activities to the local WWC. After two years of nonintervention, one more monitoring was done in 1992. Figure 4 gives the following six indicators, viz, water storage, usage, general cleanliness, water seal manitenance, incidence of diarrhoeal diseases, and use of separate container for toilet usage, water seal maintenance and general cleanliness are above 95 percentage level in all the four years monitored (1988, 1989, 1990 & 1992). Storage of water though at very low percentage in 1988 rose to 72.0 percent in the subsequent years. Functionality complaints were very negligible (Table 1) ranging from 5.1 to zero in 1992. The complaints were attended to andcorrected appropriately. The practice of seperate container for toilet use was also encouraging starting from 31% reaching 90% in 1992. Diarrhoeal diseases were recalled for last two days, and it was reported as less than 1% in 1992. In 1988 it was 5.9%.

It is true that there may be a lot of other contributing factors for the lowered incidence of diarrhoeal diseases. Nevertheless, use of sanitary latrines could be one of the contributing factors and both the users of latrines and the SEU are extremely complacent about this changed life style. The fact that with very little financial input the standard of living of a large mass could be improved is by no measure an insignificant factor.Considering the huge investments in various sectors, this is a very meagre amount compared to the meliorations brought forth.

LATRINE MONITORING DATA 1988 TO 1992

Table : 12 RAMANATTUKARA PANCHAYATH

	1988	1989	1990	1992
	(Percentage wise)			
Usage	96.6	98.6	98.5	97.2
Generally clean	95.4	97.6	97.4	97.6
Water seal maintained	98.5	98.7	97.4	97.6
Water storage nearby	31.4	68.2	72.3	72.5
Use of soap for handwashing	9.7	22.9	40.9	41.9
Functionality complaints	5.1	1.2	0.3	0
Incidence of diahorreal diseases	5.9	1.7	0.2	0.8
Seperate container for toilet use	30.9	89.9	90.1	90.5

Fig. 2. STATUS OF SANITATION COVERAGE
(Before & after SEU intervention)

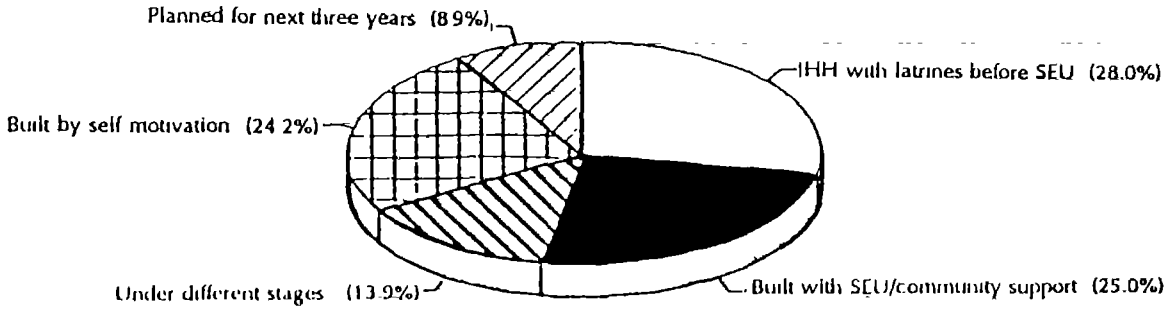


Fig.3 SELF MOTIVATING FACTORS
For construction of sanitary latrines

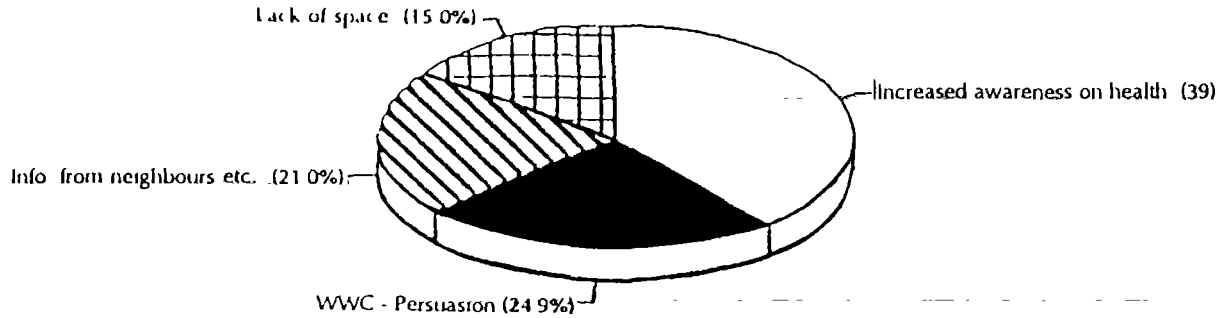
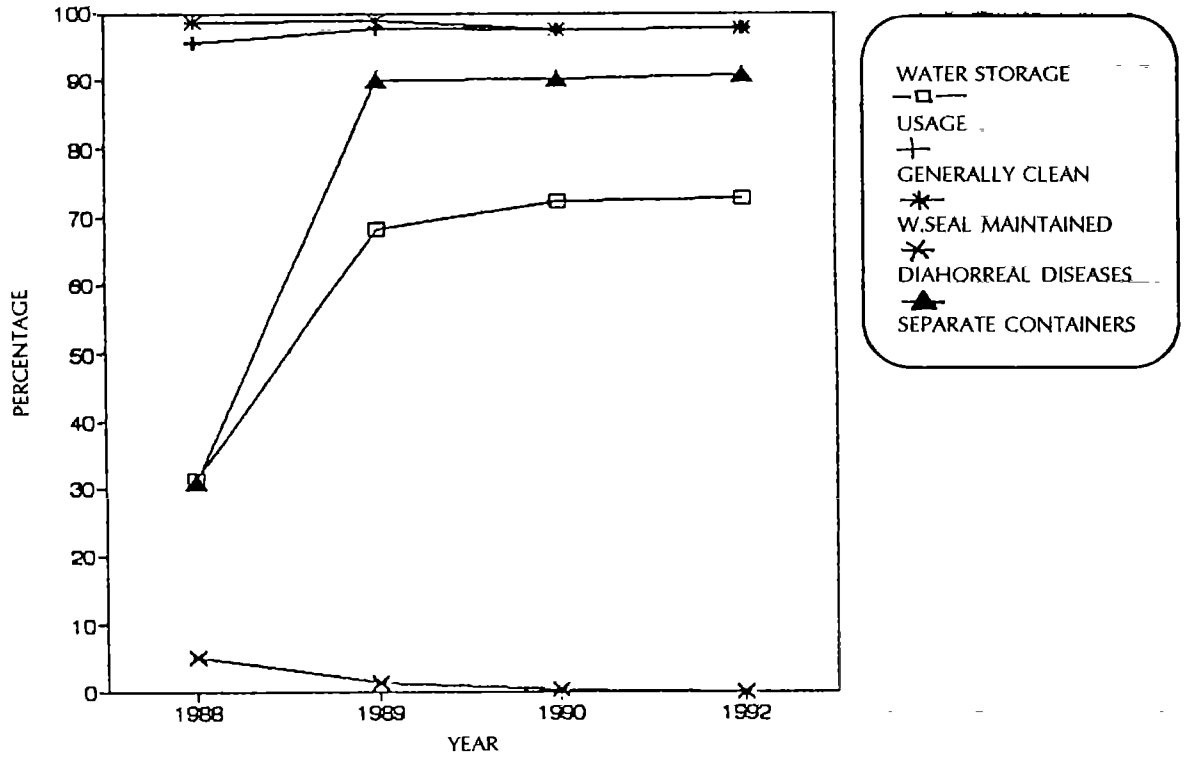


Fig. 4 LATRINE MONITORING DATA 1988 - 1992
RAMANATTUKARA PANCHAYAT - (SEU - NORTH)



ENVIRONMENTAL HYGIENE AND SANITATION IN THE FISHING COMMUNITIES OF TRIVANDRUM DISTRICT

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Summary

High water table and high population density characterise the fishing villages in Trivandrum District.

The normal defecation practises are, for men to use the shoreline and for women to use a small piece of land in or near the village.

Add to this the inadequacy of piped water supplies and crowded public wells and it takes little imagination to perceive the effects that such conditions and practises have on health in the villages,especially when coupled with ignorance and misconceptions in hygiene.

To quote from TK Vimala Kumary's book, Infant mortality among fishermen'[1], since an overwhelming proportion of families (91.2%) are defecating in the open air, that too in the very close premises of their residential area, it gives scope for the spread of contagious diseases such as typhoid and cholera which are found to be the main killers of infants and children in this area".

The infant mortality rate, IMR, in these fishing communities is 123 compared with the Kerala average of 32 and India's worst; Uttarpradesh, 140 (RG of India 1986).

This community-based project is researching environmentally, socially, economically and technically sustainable sanitation options for fishing communities.

These include reedbeds, aquatic plant lagoons, composting, vermicomposting and tidal cleansed pit latrines.

We do not try to argue that any of these alternatives are easier than conventional sanitation choices. On the contrary, they invariably demand a greater commitment from the users to adapt and participate in their operation and maintenance. But we believe that all of us must take responsibility for the waste we produce and that it cannot simply be passed on to another time or place for someone else to deal with. Rather that our waste has natural and organic place within the eco-cycles of our environment. Instead of treating our waste as something repulsive, to be hidden and disposed off we must, through organic processes, incorporate it back into our environment as something useful. As something life-giving rather than something harmful or offensive.

This requires a significant change in thinking from the existing norms. Consequently our work has a strong element of awareness raising and educating in hygiene, health and sanitation. Community understanding, commitment and participation are central to sustainability.

Introduction and Background

The inhabitants of the fishing villages on the coasts are the last-in-line water users. Their physical positon in the environment has striking similarities with their position in society. They live on the fringe of the land mass, on marginal lands or even the beach itself. Whatever has been done to the water by others, the fishing community, by virtue of their position on the coast, will invariably receive it. The effluent of the cities, towns and villages inland of them flow down the rivers, streams and canals to reach the sea and the backwaters consequently surrounding the fishing communities. In addition to this, they are poorly served, or un-served, by public water supply and sewage disposal networks. Open defecation and use of ground-water for drinking did not pose serious health threats when the coast was sparsely populated. Today it presents a serious and increasing threat to the health of children, women and men in the fishing communities. Over the long term this is a significant factor limiting the development of these communities. It would appear that in these high - density, high - water table areas, there is a choice between:

disposing of human sewage into the ground water but ensuring a safe clean piped water supply, or
to preserve and protect the ground water and to treat or process the sewage so that can be safely reincorporated to the life cycle.

For me the latter option is the most sound. As yet, these villages do not have a reliable piped water supply. Given the demand for water from the city, tourism and industry, and the increasing population are they ever likely to? And even if a guaranteed water supply does become available would it not be sound, and beautiful, if the village wells contained potable water, for bathing and brushing of teeth even for drinking in a crisis. If the present trend of pit latrines and septic tanks in high water table areas continues the ground water will become unusable.

Septic Tanks and Pit Latrines often Not the Answer

In many of the coastal villages with high water tables, pit latrines of any description are often inappropriate. The reason is because many people still depend on the ground water from open wells for drinking, bathing, mouth cleansing and washing of clothes and kitchen vessels. Even if this water is not used for drinking, it is still most inadvisable to pollute this common property resource. Septic tanks do not produce a safe effluent, they are only a primary treatment. It is most inappropriate to install them in high water table and waterlogged areas. Most septic tanks leak badly anyway. With people living on typically small plots of land, a pit litrine or septic tank, by default, lies very close to the well and penetrates the same water table. Ironically in a case like this, the family may actually have been living in more hygienic conditions when they defecated on rough land and the beach! At least then they were not directly contaminating own well.

Alternatives

Two new options which we are proposing, in particular to cater to women but eventually to men also, and which may merit development are the tidal cleansed pit latrine and the beach composting toilet with shelter belt. Land is very scarce in the village, apart form a few congested and overused defecation plots sthe only available space is on the beach, but although the men defecate there is no privacy for women to do the same. Also the faeces is often left exposed on the shoreline or is washed into the sea untreated. Women may occasionally use the beach at night but certainly not by day, forcing many privations on them. Normally they will use the unpleasant plot of land allocated for defecation with all the stigma, discomfort and health risks associated with it. Other alternatives are aquatic plants lagooning and composting toilets with evaporative reedbeds.

Tidal Cleansed Pit Latrine

The Tidal Cleansed Pit Latrine[2] is best described by the accompanying figures 1a and 1b. Essentially it comprises a simple aquaprivy or water seal type latrine atop a waterproof pit which descends to a level beneath the lowest seasonal freshwater table close to the shoreline. Beneath the freshwater table the pit is perforated and bottomless to encourage filtration and leaching of the sewage away towards the sea. If seawater is used for flushing and anal cleansing (which is traditionally the habit in shoreline defecation) this will result in the water colomn in the pit being of greater density than the freshwater outside the pit. Thus the effluent dispersing from the bottom of the pit and the perforations in the lower section will not tend to rise towards the freshwater table as they would if fresh water had been used for the flusing. Additionally the tidal rise and fall leads to a diurnal flow into and out of the bottom of the pit tending to clean and flush it. This option has the advantage that no fresh water is wasted, but the disadvantage that no treatment is attempted and the nutrient value of the sewage is lost. One would also hope the cleansing action of the tide would be sufficient and there would not be need for pumping out the pit periodically.

Beach Composting Toilet with Shelter Belt

The Beach Composting Toilet with Shelter Belt (BCT) is depicted in figure 2. This comprises a composting chamber for the faeces above which is a hole to receive them and a collector to catch the urine and direct it, via a pipe, to the roots of the shelter belt vegetation. In this case anal cleansing is by fresh water from a nearby well. Anal cleansing is not done over the defecating hole but over a normal closet immediately adjacent to it. The outlet of this closet is connected to the urine drain and thus dilutes the urine, making it a suitable feed for the shelter belt vegetation. The compost, which in six months or less should be in a dry, friable odourless form can be sold. The vermicomposting option may be incorporated too. Some of the compost produced may be added to the sand around the shelter belt to improve the soil quality further improving establishment of plants. In this way, such latrines would also contribute to coastal erosion prevention. The BCT has the advantage of minimum freshwater usage, providing water and nutrients for vegetation which stabilise the beach and also producing a valuable and safe compost.

Aquatic Plant Lagooning

The project inherited a sanitation problem which needed solving urgently, a community latrine project which was working socially but not technically. A block of ten water flush latrines had been built and the effluent led to a number of soakaways. These soakaways rapidly became clogged and contaminated the well form which the water was drawn for flushing and anal cleansing. The present system, built by the project, treats the effluent in an anaerobic decanter-digester and a series of aquatic plant lagoons. The final effluent is then passed through a small reedbed and then a slow sand filter from where a proportion of it is used to supplement toilet flushing water[3]. Plants are periodically harvested from the lagoons and composted. The system is depicted in figure 3. and in the photographs in figure 4. Lagooning systems are known to work well when receiving all the domestic effluent form a community, ie. the bathing, washing, kitchen sullage and latrine effluent. When receiving only latrine sewage, the system finds it more difficult to cope with the strong effluent. To overcome this, the project is introducing a well on the site where pregnant women may bathe in privacy (the majority of people in the village bathe openly at public wells). The sullage from this bathing will enter the lagooning system via a cascade thereby improving the dissolved oxygen in the lagoons and improving dilution. The advantage of the system is that water can be recycled for flushing and used for irrigating plants. Its chief attraction is that it can be retrofitted to existing water flush systems. However it does require more space than the other options mentioned here and consequently has limitations in the crowded village situation.

Composting and Reedbeds

In order to explore the technique of composting human faeces[5,6,7,8] in the local context, a small compost toilet is also planned on the site which a limted number of volunteers will use over the next year. This will also form a focus for education regarding this technology, its use, operation and maintenance and allow us to improve the design with experience. The faeces are to be composed in a chamber with the urine and anal cleansing water being diverted to a pair of evaporative reedbeds (see figure 5). The reedbeds are operated intermittently, one being flooded whilst the other is rested[9]. The reeds are to be harvested on a regular basis, some will be chopped to add bulk and carbon to the composting faeces and the balance may be used as domestic fuel. A variety of bulking, odour suppressing and carbon improving additives such as waste paper, leaves, cooking ashes, coir dust will be tried. The advantages of this system are that water usage is low and none of the water or nutrients are wasted, all the products can be safely incorporated back to the soil.

Awareness of Community

All of these alternatives require a considerable change in attitudes towards sanitation and hygiene. They require new understanding and that requires education and raising fresh awareness. These environmentally sustainable alternatives require the active participation and support of the users and the community. They derive their environmental sustainability from the fact that they are understood, owned, controlled and managed by the communities they serve. They cannot be imposed. A philosophy centred on people, nature an nurture must be

developed. We must take full responsibility for our own sewage, understand its potential dangers as well as its values, how to limit one and maximise the other. It is for this reason that our work starts here. Many people do not associate their present health norms with their hygiene, sanitation and water use practises. Also there are a number of deeply rooted misconceptions held by many in the communities as to the origin and modes of transmission of sickness and disease. These take patience and imagination to dispel. We are presently building our team and starting the work of awareness raising and education with particular reference to the Mahila Samajam and village youth. At the same time we are operating and developing a lagooning system for the treatment of latrine effluent from the Mahila Samajam community latrine. This also acts as learning and awareness raising focus for some of the work. We are also setting up a small laboratory in the village to analyze water samples from the lagooning system as well as from wells and standpipes in the locality.

Conclusion

These sanitation options, mobilised by active community groups and sound awareness raising may offer alternatives to the poor options often chosen presently and the doubtful expectations of centralised solutions.

The project hopes in some small way to bring about a change in people's perspectives and attitudes towards health, hygiene, water and sanitation and their inter-relatedness. Also to take a step forward in raising communities to a level of awareness where they can take decisions to select and manage environmentally sound and sustainable sanitation options.

It is also sincerely hoped that this paper will stimulate a sharing of experiences between communites, public health workers, engineers, social activists, environmentalists and others concerned about the problems we are building for ourselves whilst the present situation remains unresolved.

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Acknowledgements for help, support and partifcipation with the lagooning system are due to many. In particular to the Mahila Samajam at Pulluvila, the youth group, and community, The Programme for Community Organisation, Centre for Ecosensitive and Sustainable Development, Intermediate Technology UK, and the project team.

WET -PIT TIDAL - CLEANSED LATRINE

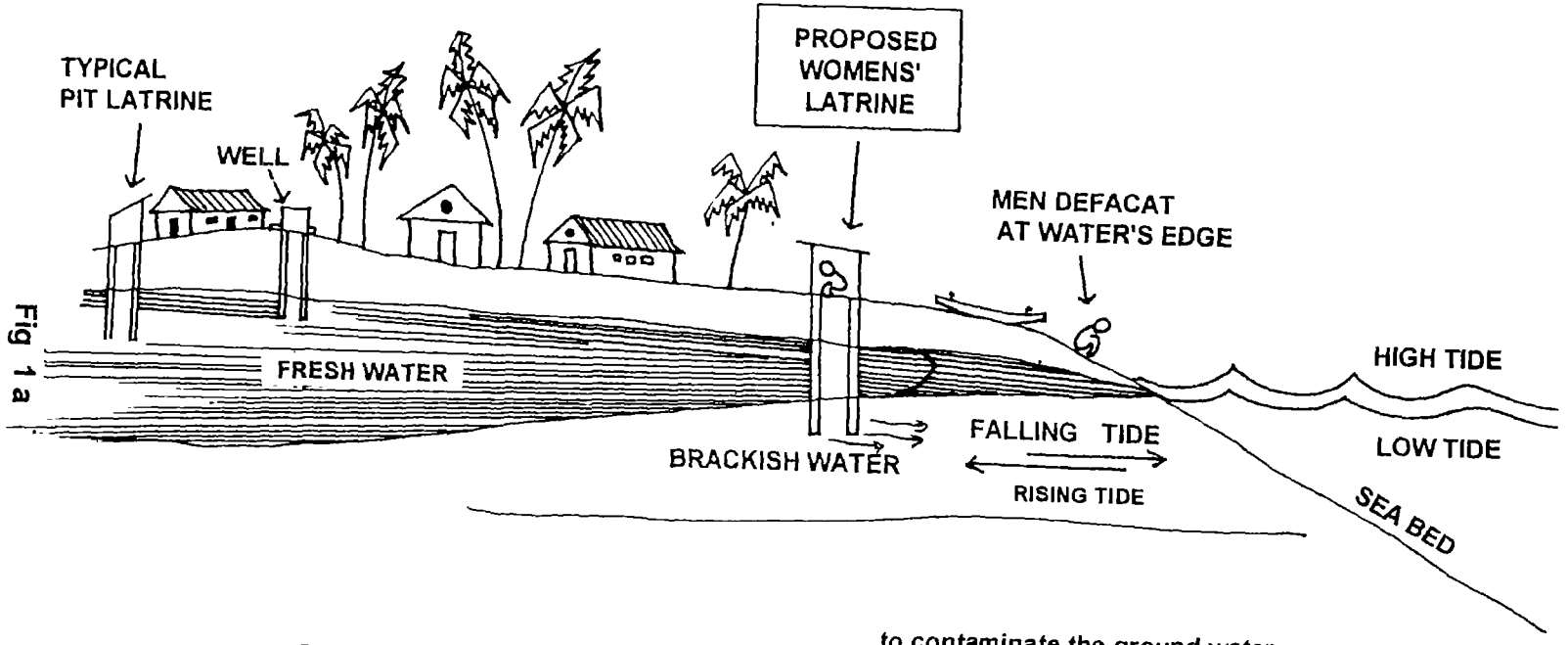


Fig 1 a

One of the biggest problems in fishing communities is lack of space for latrines. And even if people were to squeeze in lots of pit latrines amongst the housing (and the wells) it would only serve to contaminate the ground water even faster than is already the case.

But there usually is space on the beach. Men defacate there. Why not build latrines at the beach ?

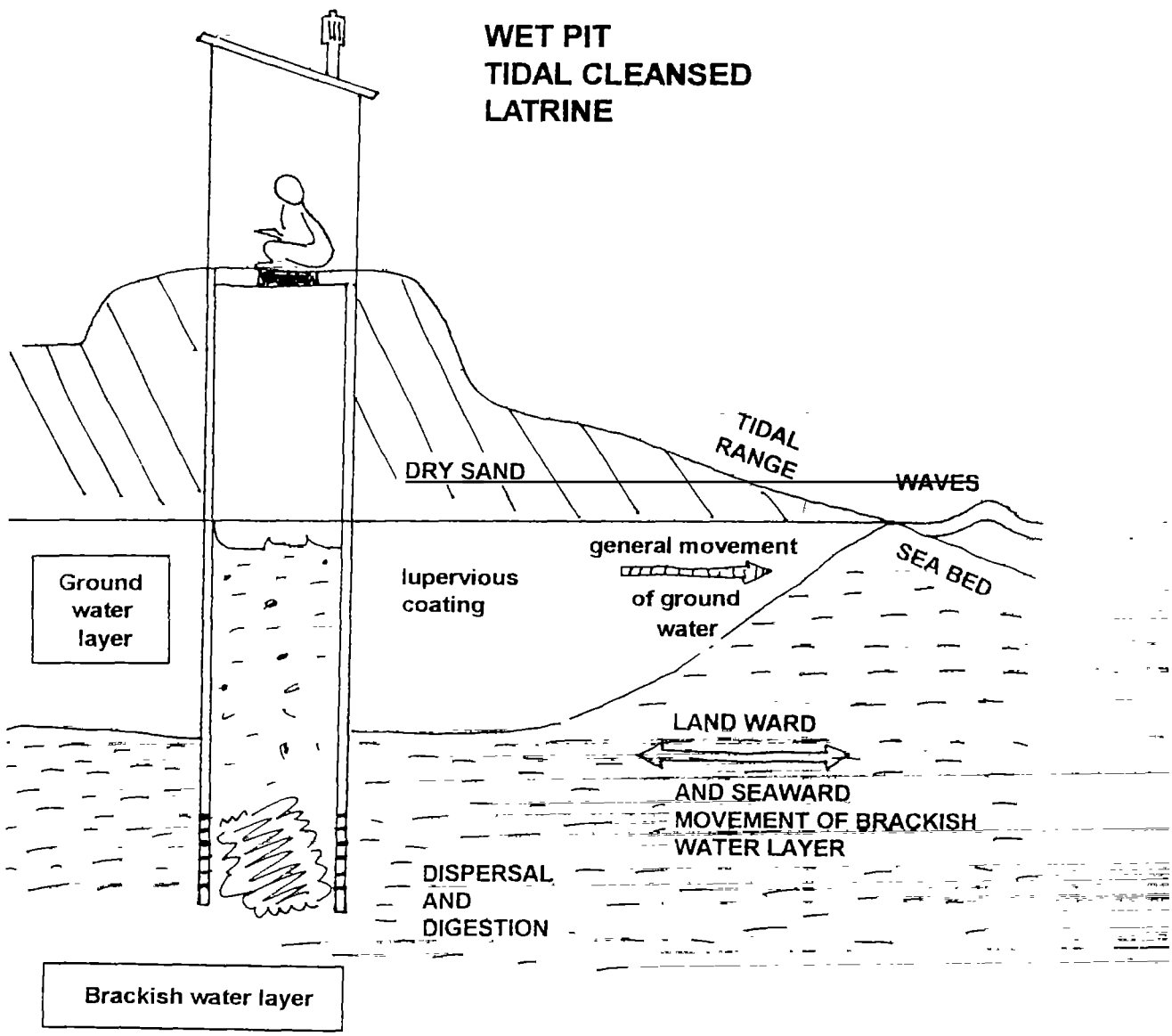
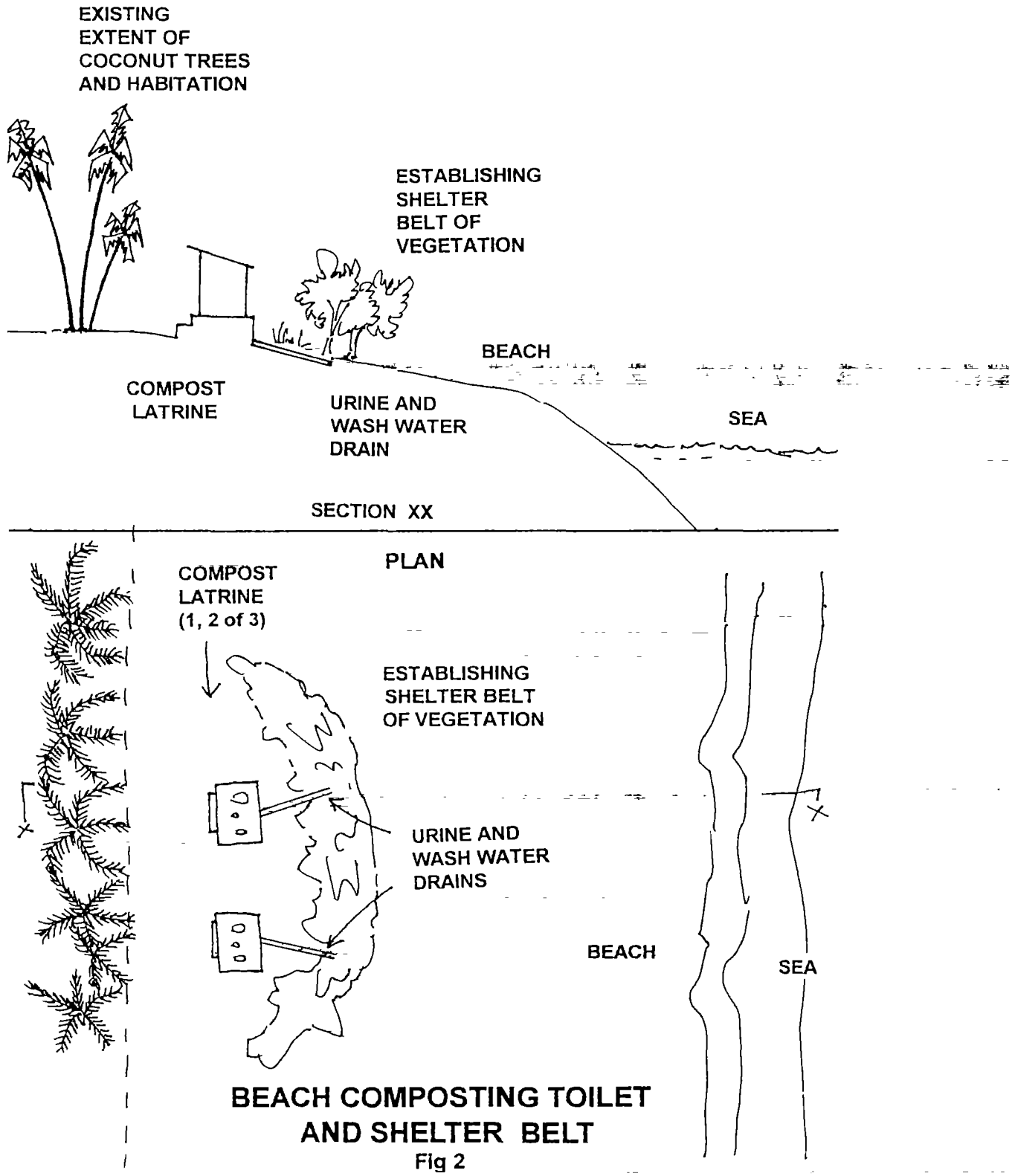
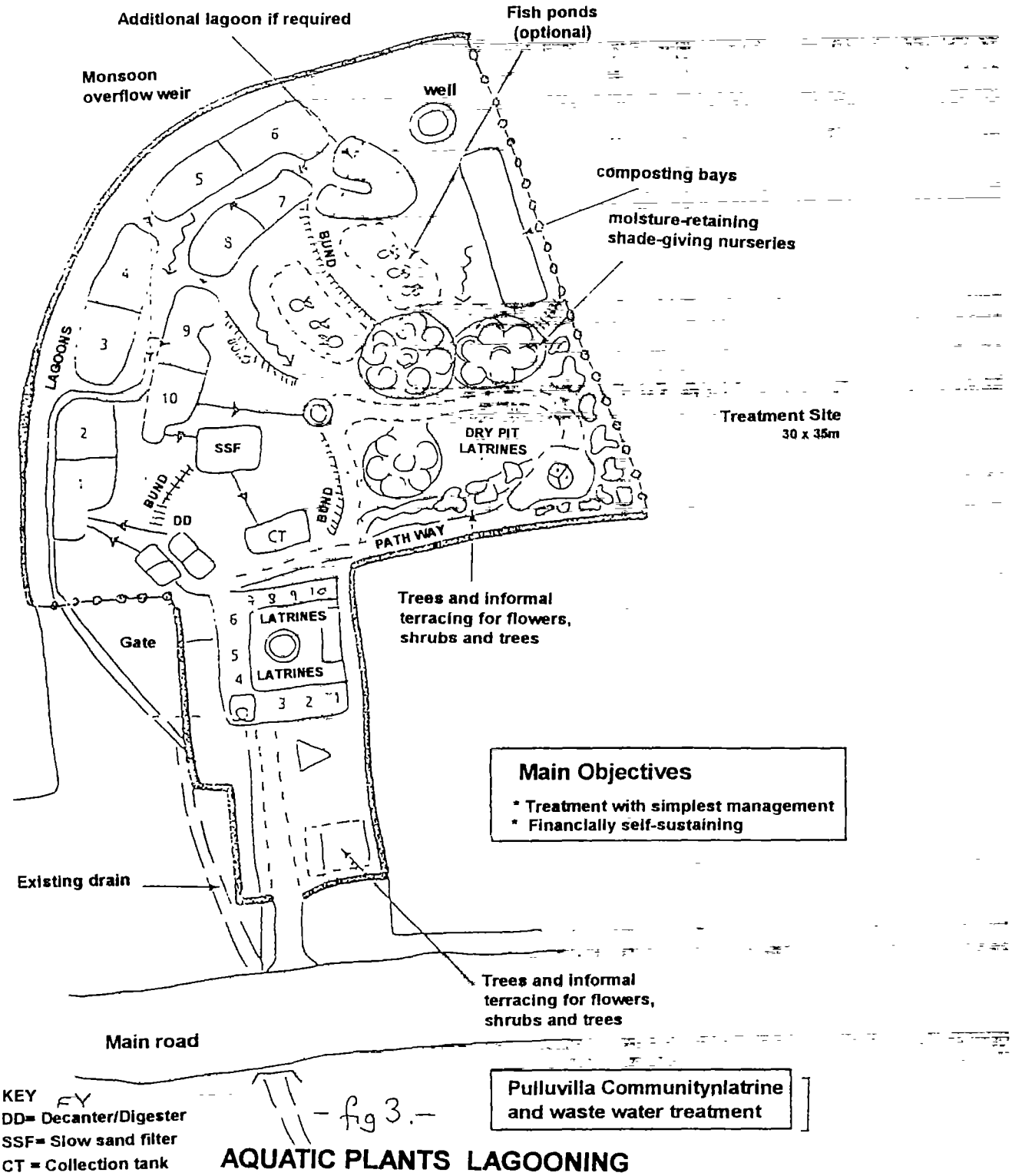

WET PIT
TIDAL CLEANSED
LATRINE
TIDAL RANGE
DRY SAND
WAVES
general movement
of ground
water
SEA BED
Ground water layer
lupervious coating
LAND WARD
AND SEAWARD
MOVEMENT OF BRACKISH
WATER LAYER
DISPERSAL
AND
DIGESTION
Brackish water layer

Fig 1 b



BEACH COMPOSTING TOILET AND SHELTER BELT

Fig 2


Additional lagoon if required
Fish ponds (optional)
Monsoon overflow weir
well
composting bays
moisture-retaining shade-giving nurseries
BUND
LAGOONS
Treatment Site
30 x 35m
DRY PIT LATRINES
SSF
DD
CT
PATH WAY
Trees and informal terracing for flowers, shrubs and trees
LATRINES
LATRINES
Gate
Main Objectives
* Treatment with simplest management
* Financially self-sustaining
Existing drain
Trees and informal terracing for flowers, shrubs and trees
Main road
KEY
DD= Decanter/Digester
SSF= Slow sand filter
CT = Collection tank
Pulluvilla Communitynlatrine and waste water treatment
AQUATIC PLANTS LAGOONING

– fig 3.–

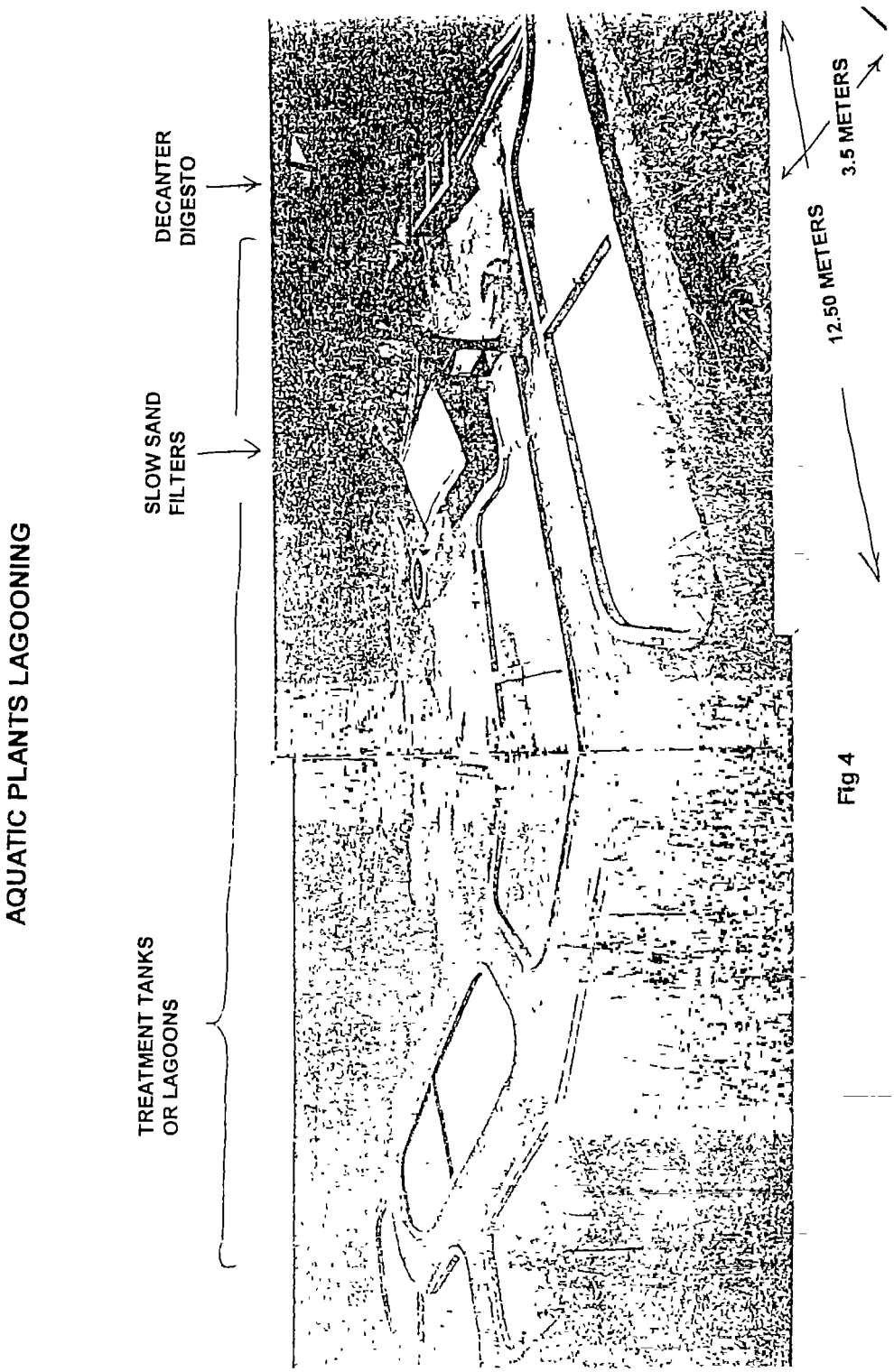
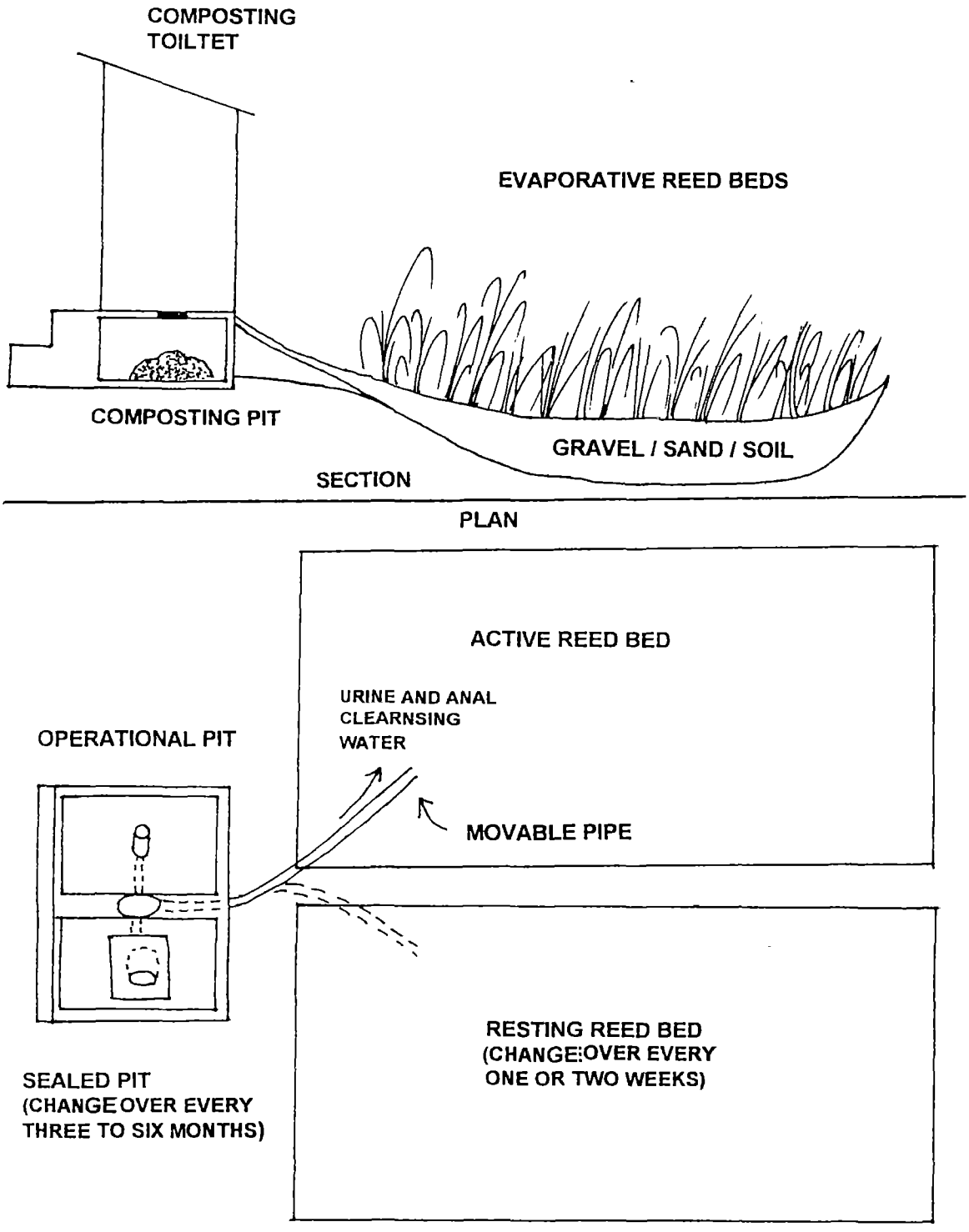

AQUATIC PLANTS LAGOONING
DECANTER DIGESTO
SLOW SAND FILTERS
TREATMENT TANKS OR LAGOONS
12.50 METERS
3.5 METERS

Fig 4



COMPOST TOILET WITH EVAPORATIVE REED BEDS

Fig 5

POLLUTION FROM HOSPITAL WASTES; ITS SOURCES, MAGNITUDE AND ABATEMENT

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The seen-but-unchallenged killer

Campaign to curb environmental pollution in Kerala is mostly limited to some couplets from poets against cutting trees. An occasional action by the Pollution Control Board gets headlines. Visibly smoggy skies and murky streams catch the eyes of a few. But not the hazardous wastes; they remain, though not out of sight, out of mind.

Releatively slow pace of industrialisation has mercifully insulated Kerala against the most common source of pollution, barring pockets like Cochin-Alwaye belt. However no state, not even Kerala enjoying a high sense of cleanliness and hygiene, is protected against a potential mass killer, hazardous wastes from the guardians of health - the hospitals.

Categories of Hospital wastes

Hospitals generate wastes which can be broadly categorised into:-

* Wastes which are supposedly harmless
* Wastes which can transmit infection

The first category of wastes is mainly packing materials, kitchen wastes, garbage and other domestic type of wastes. These wastes can safely go into the muncipal waste system; care should, however be taken to transport them quickly and carefully to the muncipal disposal sites.

The second one consists of the following:-

1. Pathological wastes, including tissues, organs, and body parts that are removed during surgery or autopsy.

2. Cultures and stocks of infectious agents and associated biologicals including cultures from medical and pathological laboratories, vaccines etc.

3. Waste human blood and products of blood, including serum, plasma, and other blood components.

4. Sharps that have been used in patient care including hypodermic needles, syringes, pipettes, broken glass, and scalpel blades, blood vial, needles with attached tubing.

5. Wastes from surgery or autopsy that were in contact with infectious agents, including soiled dressings, sponges, drapes, tubes, drainage sets, underpads, and surgical gloves.

6. Laboratory wastes from medical or pathological research, such as slides, disposable gloves, laboratory coats, and aprons.

7. Dialysis wastes that were in contact with the blood of patients undergoing hemodialysis, including contaminated disposable equipment and supplies such as tubing, filters, disposable sheets and towels.

8. Discarded medical equipment and parts that were in contact with infectious agents.

9. Biological waste and discarded materials contaminated with blood, excretion, exudates or secretion from human beings.

Hazards from Hospital wastes

In most developed countries there are no epidemiologic evidences to suggest that hospital wastes have caused diseases in a community as a result of improper disposal. The reason, of course, is that in most such countries the medical wastes are properly taken care of through stringent regulations for their effective disposal. Hence, specific studies on this issue are not available to compare the situation as between developed countries and developing countries. As far as the situation in developing countries like India, we can only guess at the likely adverse impact of leaving this issue unexplored. The outbreak of plague in Surat may be an early warning of the disaster waiting to happen.

Probable health hazards from these wastes and their improper disposal can be the transmission of the following diseases:

1. AIDS
2. Hepatitis B
3. Most common Bacterial infections including Cholera, Dysentry and Typhoid
4. Plague, Tuberculosis
5. Many parasitic infections

Studies have proved that Bacteria originating out of the hospital environment are highly resistant to many commonly used antibiotics. Hence, it may become extremely difficult to treat these patients who acquired bacterial infections from the hospital waste sources.

Magnitude of the hospital waste in Kerala

On the basis of the number of hospitals and available beds a tentative estimate of the quantum of wastes generated is arrived at

	No.of Hospitals	No.of beds
(i). Government Sector		
a. Major hospitals including Medical College Hospitals, TB and Leprosy Hospitals	148	28,872
b. Community health centres	51	3,622
c. Primary health centres	922	5,228
(ii). Private Sector	3,800	50,000 (aprox)
Total		87,722
or say, 88,000		

The quantity of infectious wastes produced per bed, per day is rockoned at 2.5 Kgs. Thus, the hospitals in the State generate more than 200 tonnes of infectious wastes every day or 7,30,000 tonnes annually.

The Present Scenario

If there is anything more deadly than the potential danger caused by infectious hospital wastes, it is the lack of concern about the danger. Presently the clinical wastes are being fed into the municipal waste system by almost all the government and private hospitals, doctor's consulting rooms, clinics and laboratories. Waste disposal systems are woefully inadequate or non existent in most hospitals. The dangerous wastes dumped into land fills next to the hospitals result in land and ground water pollution.

The workers handling these municipal wastes are themselves blissfully unaware of the danger of these hazardous body wastes. The health care workers in the hospitals are often inadequately protected because of lack of appropriate protective clothing and equipment.

Again, there are the people who run an 'informal' recycling service and thereby exposing themselves to the hazards. They rummage through the wastes for plastic, cardboard and tin.

There had also been instances when the discarded disposable syringes and needles coming back to the shops packed as new.

An agenda for action

It would be safer to incinerate every bit of waste. It is an ideal goal. But to provide incinerators to each and every hospital is unrealistic both economically and ecologically.

A practical disposal strategy, to minimize risks, can be operated in a sustainable way and do not present long term hazards. The general strategy can be:-

1. Permanently minimizing contact with waste by patients and their relatives, other personnel and population potentially affected; for this purpose plastic bags and bins should be provided to all the wards in the hospitals. The workers handling these wastes must be provided with protective garments such as coats and gloves.

2. Awareness and education programmes for medical and lay persons to appraise them of the possible dangers posed by the inappropriate and careless handling of medical waste. This must include orientation and continuing education programmes and training for all health care workers.

3. To instil the importance of tracking and disposal of infectious wastes in hospitals not only in the minds of medical personnel but hospital administrators and the government.

4. WHO has come out with a simple design for a waste pit- which may be suitable for our hospitals and community health centres in the rural areas.

5. More exotic options are also being pursued. For insance, at Armed Forces Medical College, Pune, a research on processing the hospital residues through vermiculture is being tried out !

Conclusion

We have so far escaped a major health disaster. But we are at risk of making a bad situation worse. Stringent acts to regulate these hazardous wastes requiring the hospitals to track and handle them from generation to disposal are to be promulgated. They should be closely monitored for any infringement.

Meanwhile, we have to search for a suitable technology which is relatively cheap, simple and ecofriendly.

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TRIVANDRUM SEWAGE - ENVIRONMENTAL HAZARD ON ACCOUNT OF LACK OF PROPER DISPOSAL FACILITY

B.F.H.R. Bijli & K. Padmanabhan Achari ,

Thiruvananthapuram city is the administrative capital of the state of Kerala of the Indian Union. It is located close to the southern most tip of the Indian sub continent. The city is governed by an elected city corporation council.

Thiruvananthapuram corporation encompasses an are a of 74.93 Sq.Km. having fifty administrative wards. The area is at an average latitude 8 degrees 25 mins. N and longitude 76 degree 50 mins E. The city has a population of 5,24,000 as per 1991 census.

The city has a continuous drinking water supply system. It also has a water carried sewerage system covering about 20 Sq.km of the corporation. About 40 percent of the households are connected to this.

The city has an undulated topography with ground level varying between 0 and 75 m above mean sea level. Two major rivers viz. Karamana and Killiyar and a number of small streams flow through the area. Characteristic undulated topography, porous top soil and presence of a number of streams in the area make the city well drained except at certain locations which lack secondary drainage system.

Geologically the city is underlain with laterite along the eastern portion and alluvium along the western fringe. Crystalline rock exposures are seen in and around Thirumala and Perurkada.

SEWAGE TREATMENT AND DISPOSAL FACILITIES

General

The existing sewage conveying system at Thiruvananthapuram city is virtually ineffective to convey the voluminous sewage load of the city to disposal area located at Valiathura. The problem is further aggravated by the present precarious condition of the treatment process which is based on an obsolete technology of fodder farming. It is unable to take care of the increasing sewage load reaching the farm area. Hence the entire sewerage system is practically defunct, with raw sewage finding its way through punctured manholes and leaky sewer lines, ultimately getting dumped into open lands or surface water bodies. Such an unhygienic condition can not be allowed to continue further. This calls for upgradation of sewer lines and pumping stations, on one hand, and adoption of an acceptable option for sewage treatment and disposal on the other hand.

Status of Sewage farm

The sewage farm at Valiathura is of a very old design having been constructed about thirtyfour years ago. The farm was anticipated to cater to a sewage flow of about 8 mld. Ever since the construction in 1960, there has been no increase of the size of the farm commensurate with the increase of the sewage load or adoption of any modern sewage treatment techniques. The gross area available now for sewage farming is 102 acres. Presently, farming is done in 82 acres and remaining 20 acres is kept as fallow land. The cultivated area is divided into 6 blocks. There is a 1 metre wide main sewage canali which has got various sub carriers each 30cm wide at about 8 M interval, running across the entire farm area which are meant for irrigation. The city sewage is at first brought to a stilling chamber by pumping through 3 terminal pumping stations located at Kuriathi, Pattoor and Enchakkal. From the stilling chamber, sewage gravitates into sewage farm, gets percolated down wards and gets collected by a system of under drains. The flow through these under drains, as well as the overflow, reach the two catch drains and get discharged ultimately into Parvathy Puthanar. The subcarriers running across the farm are poorly maintained and most of them are blocked up or broken . Thus these channels are not in a position to convey the entire sewage uniformly into the cultivable areas.

It was envisaged that the waste water will be diluted with fresh water drawn from the deep tube wells located inside the sewage farm area. However the deep tube wells drilled for this purpose are now defunct. Though there is a pump house and the sewage is expected to be mixed with the water pumped from Parvathy Puthanar which is passing near the sewage farm, the same is not done due to non-availability of power on continuous basis and out of order pumps. The Parvathy Puthanar itself is polluted. The available area of cultivation in the sewage farm is neither capable of nor being used for absorbing the total sewage reaching the stilling basin. Not more than 10-15% of the total sewage produced is being utilised for the fodder cultivation. In other words, about 85-90% of the sewage produced is not being passed through the sewage farm. A major portion is finding its way to the Parvathy-Puthanar and the rest is spreading over low lying areas.

Environmental Scenario & Pollution Status of Sewage Farm.

In order to decipher the environmental scenario and status of pollution existing in and around the sewage farm, a critical examination and review of various components were carried out.

General Properties of Sewage Effluent

Sewage effluent samples were collected from different locations and analyzed. The effluents are found to be very rich in organic load and need appropriate treatment before allowing them to be discharged in to open water bodies. The relationship between BOD and COD values indicated the effluents to be high in putrescible matter. Total amounts of NH_4 NO_3 nitrogen and water soluble P were also observed to be rather high. Concentration of phenolic compound were also high. Soluble salt content of the effluent were on the higher side of moderation range which may affect the soil quality adversely, when used for long time. Zn, Mn and Fe were

observed to occur in some amount with an occasional trace of Hg. Such low occurrences of metallic ions were due to lesser extent of mixing of industrial effluents in the sewage.

Sewage Sludge of Farm area

The organic carbon content of these sludge materials varied between 1.59 and 2.64% resulting in formation of an organic rich substrata in the bottom. pH values were moderately low while the soluble salt contents were somewhat high, indicating that continuous use of waste water may ultimately lead to degradation of soil conditions making it not conducive for good vegetative growth.

Metals in Sewage sludge of Farm Area

Fe, Mn, Cu and Zn are present in incomparatively higher amount in the sludge while the others occupy low to moderate concentrations. Presence of some metals in the sludge in considerable amount, in spite of their scarce availability in effluents, may be due to occurrence of these metals in the form of settleable organic particles which precipitated rapidly at the bottom in the form of sludge. Such occurrence of metals in sludge may ultimately affect the farming system in the long run.

Effects of Sewage Effluents on Outfall Areas

Change in BOD and DO values in sewage contaminated water at Parvathi Puthanar near the farm, before disposal point at Moonattumukku, after disposal point and at confluence point have been presented in table below.

CHANGES IN SURFACE WATER QUALITY AND RESULTANT DILUTION

Parameters	Near Farm	LOCATIONS		
		Before discharge Point (Moonattumukku)	After discharge Point (Moonattumukku)	Confluence
BOD	220	150	20	10
DO	Trace	0.8	20	4.0

The table clearly shows that BOD values were quite high in Parvathy Puthanar near the farm area and this resulted in lowering of DO values in the river water rendering it unsuitable for survival and growth of biotic community. Similar behaviour was observed up to disposal of the raw sewage at Moonattumukku where high organic load of the sewage effluent affected the

quality of water in the outfall area. However, after Moonathumukku, there is a sharp decline in the value of BOD and a corresponding rise in DO level, which conclusively proves the effects of dilution. Disposal of raw sewage increased the organic load in the outfall area which adversely affected the primary production and the biotic community of the region. However, high nutrient concentration of raw sewage effluent increased the Nitrogen and Phosphorous concentration of the outfall area and produced indications of gradual eutrophication.

Problems of Ground Water Pollution

In order to find out the probability of aquifer contamination and ground water pollution caused by the seepage of sewage in the sewage farm, samples were collected in a systematic manner from eight sites viz., six dug wells covering different sides of the sawage farm, one underground composite seepage water of the farm and the last one collected from a dug well at Anayara which is free form sewage pollution and, therefore, served as control.

Moreover, the extent and nature of ground water pollution taking place in the sewage farm may be understood by comparing the values of different parameters of sample nos. 1 to 7 with that of sample no. 8 (the control). BOD and COD values are low to moderately high in all the water samples. The colour and odour of these waters are not favourable in most of the cases. Amount of NH_3N_1 NO_3 M and Phosphate are also rather high, in some cases, and marginal in others. Concentration of phenolic compounds are above critical level.

Total coliform load of such ground waters collected from wells situated very near the sewage discharge canal at the time of full flow capacity were in the range between $1.3x10^3$ and 2.6×10^4 MPN/100 ml. A very positive evidence of sewage pollution of ground water has been recorded from the occurrance of chironomid larvae (4.5 numbers) in every bucket of water drawn from the wells situated near to the sewage farm.

Occurrance of Metals in Ground Waters

The ground water samples chiefly comprise of those metals which were present in the sewage effluent also. The water exhibited concentrations of Fe and to some extent, Mn. Although moderate concentrations of Zn could be detected in all the water samples, yet the values were below the critical level, if we consider the potable parameter of water.

Surface water pollution

To study the effect of sewage discharge on the properties of the receiving water, water samples were collected at different locations of the region starting right from Moonattumukku and gradually moving the disposal point towards the sea face situated about 1.5 km downstream. Near Monattumukku, samples were collected when sewage discharge was temporarily suspended and during the period of sewage disposal. Water samples from the adjacent Karamana river, having lesser pollution load due to indirect flow of waste water, was also collected for comparison. Water quality of the fresh water pond at Anayara was also studied which served as a unit of reference.

Release of sewage effluents affected almost all the characteristics of the river water and there byconfirming the increase in organic load of the river water is due to the discharge of sewage. Variations were also observed in other properties as well, especially Nitrogen and Phosphorus. However, the organic load of the water body declined considerably as the flow reached near estury, although the value was much higher than that of Karamana river. On further downstream, there was large scale release of coconuthusk-retted waste water arising from some creeks surrounded by coconut groves.

Occurrance of Metals in Surface Water

Concentrations of Zn, Mn and Fe, the three major metals occurring in raw sewage were also observed in higher concentrations in the surface water at Moonattumukku during the period of sewage disposal than the period when the disposal was suspended and also of the adjacent Karamana river water which did not receive these effluents.

Status of Soil in Sewage Farm

The sewage farm is underlined by a fairly thick cover of soil which allows ready seepage of raw sewage through it. Continuous use of sewage effluents within the farm area has changed the nature and properties of these soils especially in such blocks which are put to fodder cultivation. However, the case is just the reverse in the extreme southern portion of the farm, which is essentially kept as a fallow land and this zone did not receive any sewage effluent directly.

It is observed that the use of organic rich sewage load has resulted in considerable accumulation of organic matter on these soil surfaces of the sewage farm compared to the corresponding value of the fallow land lying in the extreme southern portion.

The values of electrical conductivity (E.C) are also quite high indicating accumulation of soluble salts in the soil. Moreover, a positive co-relation was there between the concentration of organic matter and N/P ratio of the surface soils. Such behaviour was obviously expected since the organic matter forms the chief source of nitrogen content could, in turn, be attributed to application of sewage which may ultimately affect the crop health adversely, because higher concentration of nitrogen is supposed to encourage susceptibility of plants to disease and pest attack.

Occurrance of Metals in Soils

Metals like Fe, Mn, Zn, and Cu constituted the major ones in the surface soils. While other metals also exist here, their occurrences are only noted in moderate to low concentrations. The soil in the control area, south of the farm, exhibited the lowest concentration with respect to all the metals as compared to those of sewage-fed areas.

The sub-surface soils of the farm were sandy in nature and hence the soluble portions of the sewage penetrated easily through these soils both vertically and horizontally. This resulted in

moderate increment in organic matter content of the sub-surface soils through accumulation of soluble organic matter. Lateral movement of water within the sub-surface soils resulted in considerable accumulation of soluble salts in the fallow area also. This indicates that the sewage effluent has the potentiality to move both vertically as well as horizontally. Perhaps such movements are also responsible for polluting the ground water of the nearby locality, as observed earlier.

Fe, Mn, Cu and Zn are found to constitute the major metals in case of sub-surface soils and these are followed by Pb. Concentrations of other metals, some of which are toxic in nature, are of very low order in these soil samples in contrary to their surface counterparts.

Characterisation of Bottom Sediments

The nature and properties of the bottom sediments in Parvathi Puthanar and its outfall area were studied along with sediments of the adjacent area of Karamana River. The river bed sediments of Parvathi Puthanar exhibited quite high concentration of organic matter and such characteristic were observed in the outfall area as well. The effect of sewage effluent on these sediments was distinct when the values were compared with those of Karamana River bed. Accumulation of such high amount of easily decomposable organic matter in the soils of the out-fall area is likely to develop anoxic condition in the bottom and thereby affect the biological life of the surrounding areas. Increase in the amounts of available nitrogen and phophorous in the soils of the outfall area due to sewage dicharge were also quite significant. Bottom soils at outfall areas exhibit moderate to high concentrations of Fe, Zn, Cu, Mn and Pb. Other metals namely Hg, Cr, Cd and Ni, although much available in the sewage effluent, yet occurred in low to moderate concentration in these bottom soils. Gradual accumulation small amounts of metals originating from sewage effluent might have resulted in such concentrations.

Biotic Community (Floral and Faunal Diversity) Plankton, Benthos and Fishes

The benthic fauna in Parvathi Puthanar adjacent to the out-fall area are mostly affected due to sewage toxicity. The stretch and the size of the area affected depends on the degree of flushing and dispersion in the discharge area, topography of the river bottom, sedimentation charactristics of the waste and quality of the waste discharged. Since the river water is not prone to tidal effect and wave action, the soils carried by the sewage tends to accumulate near the sewage discharge point. As the deposited organic matter degrades, dissolved oxygen tends to decrease in the receiving waters. Species of benthos unable to adopt the altered substrata are replaced by opportunistic species that prefer more oganic rich sediments, the diversity of benthic species decreases whereas biomass of opportunistic species increases. Among bottom dwellers, snails and clams and crustaceans are present as commonly encountered in such organic rich sediments. Near the disposal point, very poor and at the farm site, practically no macro bethic organism was present due to high concentration of organic matter. Some fresh and brackish water fishes were caught from 500m and 1000m downstream from Moonattumukku on the Parvathy Puthanar river.

The disposal area and the farm area were devoid of fishes during waste disposal period, but during other times when sewage effluent discharge was temporarily discontinued, the movement of a few dishes was noticed. Many fishes no doubt prefer to feed on food associated with disposal areas and their productivity and growth may actually have to be enhanced by nutrients and organic carbon inputs associated with domestic waste discharge. However, the dissolved oxygen level of the water was so low during sewage discharge period that the fishes visited this area only during suspended disposal period to utilise the food available there. Study of plankton revealed that the concentration of plankton in the sewage influenced river water was higher than the control water body.

Productivity of the Waterbodies

In order to study the productivity potential of the sewage as compared to the fresh water of an impounded area (pond), both gross and net primary productivity studies were carried out in (i) the sewage influenced water at Moonattumukku and(ii) the pond at Anayara. The result of the study has been presented in Table below.

PRIMARY PRODUCTIVITY OF SEWAGE AND FRESH WATER

Location	Water Quality	Primary Productivity(mg^{-3} $cm^{-1}h$) Gross	Net
Moonattumukku	Sewage mixed	93.75	37.50
Anayara	Fresh Water	131.25	56.25

The results shown in Table above indicate that sewage influenced water of Moonattumukku exhibit lesser productivity status in relation to food production both in terms of gross and net productivity. Such result, in spite of higher nutrient concentration in the sewage may be due to higher amount of organic load.

General health Status and Prevalent Diseases

The area in which the fodder grass is grown in the sewage farm is infested with poisonous snakes and other reptiles. The workers are exposed to the risk of being bitten by these reptiles. Even though the workers are provided with gum boots, it is learnt that cases of snake bites are not uncommon. Due to stagnation of sewage water in the fodder fields, the workers cutting the fodder grass come in to contact with the sewage and often suffer from skin irritation. The workers also suffer form one related disease and often compalin from chest pain, body weakness, stomach disorder etc. The lack of medical facilities aggravate the situation.

There are certian hutments location in the areas adjoing Parvathy Puthanar. The people living in these hutments do not have any house hold safe water supply. There are some standposts in the area form which they collect water. To augment their water supply, they often take water from the polluted wells of Parvathi Puthanar and use that water for a number of house hold purposes. Taking bath in Parvathi Puthanar is also not a very uncommon scene. All these prove that that presently existing sewage farm and the indiscriminate discharge of waste water to Parvathi Puthanar do cause health problems, not only to the farm workers, but also to the people residing in nearby hutments.

In order to prove conclusively about the adverse effects of both ground water and surface water pollution on general health status of individuals, a health survey was carried out among the residents of certain blocks around the farm area by soliciting answers on a structured questionnaire. From the survey, it appears that incidence of skin disease are very common in the locality. Dysentery and fever are also common. Besides, the farm areas serve as a healthy breeding ground for various other organisms like insects, flies, mosquitos, rates and frogs thriving well in these marshy, water - logged areas. Frogs serve as ready prey for snakes which therby multiply in huge numbers. The colour and odour of the house hold well waters are also beyond acceptable limits. A mild foul smell is contantly perceived in the ambient environment which may be due to methane gas produced by the bio-degradation of the sewage flowing through the farm area. All these factors undoubtably prove the existence of pollution in soil, air and water which has a direct bearing on the health of the population residing in the vicinity of the sewage farm.

Conclusion

Taking all these considerations in to view, it could be concluded that the present treatment process is ineffective and needs to be suitably replaced by a more effective treatment mechanism which could be techno-econlogically and economically acceptable.

The following processes are available for treatment of sewage.

1. Activated Sludge Process
2. Trickling filter Process
3. Aerated Lagoon
4. Extended Aeration System
5. Stabilisation pond
6. Duck weed pond
7. Sewage farm

However, selection of a particular system is a very difficult and complex exercise, as a large number of parameters/factors are to be considered and weighted for each available treatment process to finally arrive at particular decision. All agree that whatever treatment facilities are proposed for Thiruvananthapuram, it has to be sited/accommodated with in the present sewage farm area, since the sewerage system is so designed and laid out it drains to this point, as this

is the lower most area topographically and no big chunk of land is available nearby. Based on land constraints, some of the above processes are automatically ruled out. Again the proximity of the air port envisages avoidance of bird menace. We have to choose such a system which would accommodate the future expansion and would take in to account the constrains mentioned above. The consultants who studied this have recommended Extended Aeration as an apt treatment process with utilising the treated effluent to continue the fodder farming in the remaining area.

This paper is based on the Environmental Assessment study of the existing sewerage system done by the Kerala Urban Development Project. The consultants of the study were M/s. Consulting Engineering Services (I) Pvt. Ltd., Calcutta. The authors were associated in the preparation of the above study by assisting the above organisation. The intention of presenting this paper is to draw the attention of people, the necessity of the rehabilitation and strengthening of the Trivandrum Sewerage System which is the only big enough sewerage system in the Kerala State.

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POLLUTION AND THE INDIVIDUAL REACTION

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Introduction

Pollution and environmental problems are subjects too much talked about but not always rightly conceived and sincerly imbibed. While reacting to environmental issues, the individual commitment to a solution seems to be evasive. It is rarely remembered that an individual is part of this dynamic system and each and every individual action is a complement either to environmental protection or otherwise, to destruction. Only a holistic concept and a disciplined approach can be solution to the problems of the environment.

The concept

Pollution is mostly conceived as the contamination of air or water which render them useless to mankind. But this concept is too much confined. Pollution is rather an immediately perceivable form of an impending environmental problem. Environment is a constituent of the three mutually interacting and influencing segments, the atmosphere, the lithospshere and the dygrosphere, and the fourth one - the biosphere, manifesting over these three, all together being in a state of dynamic equilibrium. The effect of any action on any of these segments will be propagated through out the system in total, in chain, and, side chains in differing manifestations. The conditions of the environment is normally described by the physical, chemical and biological factors. Pollution, more precisely can be defined as a change in the natural condition of the environment.

The origin and manifestation of the problem.

The existence of life itself is exerting a pollution load on the environment by way of extraction of resources and release of residuals back to the environment. But this comparitively low pollution load will be assimilated by the environment and the resources regenerated. As the social need increase, resources are over extrated overtaking the process of assimilation and regeneration and residuals build up. More than that, when it becomes greed rather than need, it is exploitation instead of extraton, leading to simultaneous environmental deterioration and waste accumulation, leaving detrimental effects on the ecosystem and disturbing trends on the environmental equilibrium. Along with over extration of resources, wide spread modification of its regimes, utter disregard and total neglience are the social attrocities on the environment.

Pollution can have diverse dimensions and many manifestations. Presence of used plastic materials or such rubbish in a park, beach or any other public place is primarily an aesthetic problem. When the presence is wide spread, it is more than an aesthetic problem. An unpleasant smell is a nuisance problem and so is dust. In a suffocating level, unpleasant gases, vapours or dust is a health problem. Presence of atmospheric pollutants result in the formentation of fog

of smog and crete visibility problems and bring forth man made disasters like road accidents or plane crash. Continued presence of air pollutants result in a second dimension by producing photochemical by products, more harmful then the original pollutants themselves. They cause elevation in atmospheric temperature by way of the Green House effect, cause acid rain, create water and soil pollution and consequent destruction of vegetation followed by ecological shifting or ecodestruction. Further, such situations induce changes in global circulation pattern resulting in disasters like drought, flood, cyclones or hurricane. Water pollution problems can manifest in similar ways from simple aesthetic to large scale environmental problems. Colouring materials or suspended solids in water can cause to the aesthetic rejection and if in higher intensity, can interfere with the processes of aquatic life. Pollutants in sewage or industrial discharges can bring forth insanitary conditions resulting in the spread of water related diseases. Pollutants, rich in phosphorus can cause entrophication resulting in the death of the water body. Pollution problems ultimately can result in the modification of environmental regimes, erroding its qualities to support civilizations or life even.

Awareness or awakening ?

Truly understanding on the problems of the environment, the world over. Mrs. Rachal Carsons classic `The silent spring' published in 1962 have perhaps been the inspiration. Ten years after, the Stockholm Conference on the Human Environment have been instrumental in the globalisation of this inspiration. The 1970s and the 1980s have been decades of environmental awareness and concern. This concern have well been translated into a policy by world governments and environmental protection is a susbject in governance. The world commission on Environment and Development has published a book "Our Common Future" in 1987. The spirit of this book is more a practical advice on how to live with in the world's ecological means. The globalisation of environmental living identifies efficiency, economy and equity as the guiding principles of environmental protection which makes individual response vital to these programmes. But such a spirit is not practically imbibed by the world community. Eventhough, there is sufficient reaction or even overaction on environmental issues personal commitment seems to be distant. It is an awakening rather than an awareness. Translation of this awareness or awakening into actions of environmental protection seems to be a very slow process.

Environmental discipline is the need.

Man being the most powerful manipulator of the environment, second only to natural events, his actions, life styles and attitudes have a determining effect in inducing, magnifying and propagating environmental effects. The good old times when man thought only of essentials are burried deep in anthropological piles and the times of basic needs heaped in historical files, comfortable living is far forgotten. Luxury is sidelined by super luxury and an undefined development quest is fast forward. This certainly has to settle down to an environment friendly living to sustain living itself and the individual commitment and contribution to this process of settling down has to be the primary concern for the coming years. This frame work for environment-friendly living can be called environmental discipline, which is nothing serious than social discipline or self discipline. Practicing discipline added with an environmental

thinking will sufficiently guide to the essential extent of environmental protection. Prudently, differentiating the basic needs, the essentials and the luxuries itself will be a sound step towards practicing it.

At home; first

In the home environment many adversities can usually be noticed. First is the increasing energy intensive nature of the house holds. Lighting devices, fans, air coolers, air conditioners etc. are freely used. An environmental friendly aerodynamic design doing away with the prevalent style off `privacy' will permit more light and air movements, helping in a reduction in lighting or fanning requirements or even avoid the need for air cooler or air conditioner. In the kitchen, if a kitchen machine can be avoided resorting to good old `hand machine' it will not only be a saving of energy but also a good physiotherapy for the family members. Becoming energy intensive means straining the environment with the fall-outs of Hydel, Thermal or Nuclear power projects.

There is a growing tendency to sideline the idea of conservation, best example being the use of water. Water is the life-sustaining wonder liquid. But this knowledge is not imbibed while using it. The world water resosurces are getting polluted and depleted day-by-day by various human activities. Water treatment cost or extraction cost is spiralling up. Drinking water is becoming a costly commodity. In the wash basin, in the washing machine, in the bath room, in the garden and everywhere, if water can be conservingly used, it will an environmental gain.

Equally important is conservation of fuels. The waste of fuel is a frequent malpractice in the kitchen. The kerosene or gas stove can release into the environment, considerable quantities of carbon monoxide, partially burned or even unburned hydro carbons if the burner system is inefficient. The effect of carbonmonoxide as a pollutant is well known. It competes with oxygen in combining with heamoglobin and forms carboxyheamoglobin. It is oxyheamoglobin that supplies oxygen to the tissues by easily releasing oxygen and regenerating haemoglobin. Carboxyhaemoglobin can neither supply any oxygen nor easily regenerate heamoglobin owing to its increased stability. A timely attention to the burner system will avoid pollution of the home environment, avoid waste of fuel and will provide hot blue efficient flame that will not blacken the cooking vessels, which in turn will reduce the use of water and cleaning agents.

The modern home is supplemented with a number of chemicals in varying formulations or combinations used for different purposes ranging from beauty agents to medicines. The capacity of these chemicals to interest with the basic molecules of life is not fully understood. But available data warrants a certain amount of caution to be applied.

The first among them to be mentioned are the chemical preparations in our dressing room. Hair dressers, deodorants nail polish, lipsticks etc. All these beauty agents find a respectable place in our home. Hair dyes are generally paraphenylene diamine which is a coaltar product. Most hair shampoos contain sodium lauryl sulphate and a builder such as phosphate. Hair permanents are thioglycollic acid, oxydising agents like hydrogen peroxide, potassium bromate and sodium perborate along with various additives to control odour, colour, acidity

and reactivity. Hair sprays contain a plastic resin polyvinyl pyrrolidine blended with a plasticiser dimenthyl phthalate and solvent-propellant mixture ethanol freon - 11 and freon - 12. Freons contribute to the problem of stratospheric ozone hole. Hair dying have become a very popular activity, even though grey hair is a symbol of seniority. Beauty parlours are profitable business but they are the `social holes' all the way.

A typical deordorant is hydrated aluminium chloride or aluminium chlorohydrate dissolved in an alcoholic solvent. As astringents, they can reduce or close-up the opening of sweat glands by chemically interfering with the protein molecules, in a sense preventing sweating. Sweating is a natural way of cleaning the body system. Arresting sweating is suicidal as it strains the kidneys. To get rid of the smell of sweat, drinking sufficient quantity of water is the best way. Lipstick and nail polish contain highly coloured coaltar dyes which are direct health hazards. An emphatic 'No' to these items by individuals to the cause of the environment will be the right attitude.

Cleaning agents find an important place in homes. Detergents for cloth washing, toilet bowl cleaners, window cleaners, floor cleaners - they appear in many trade names and brand names. A typical solid detergent marketed today contain sodium alkyl benzene sulphonate (18%) sodium tripolyphosphate (50%) water and inorganic filler (19.7%) anticorrosion agent (6%) de-dusting agent (3%) foam boaster (3%) and optical brightener (0.3%). It is not argued that all the above chemicals are direct heath hazards eventhough some of them are. The most important point is the application of an environmental sense and an idea of conservation in using them. Lured by the lucrative display by manfacturers and market operators, they are usually accepted with a free hand and the society is going lavish. In the production facilities of these items and their accessories like wrappers, packing, printing etc. there are certainly the problems of waste treatment and pollution control. In the transportation of these items to the consumers, a good amount is being spent. A prudent mind to conserve and limit the use of these items to the bare minimum will certainly reduce the pollution problems, reduce transportation cost all which will contribute to environmental gain .

For the control of rodents, cockroaches, houseflies, mosquitos and such other insects, a number of chemical formulations are used in the home environment. They usually contain the basic chemicals such as sodium arsenate, sodium fluoroacetate, strichnine, warfarine, zinc phosphide, or phenolic derivatives etc. Man is not far seperated form his fellow species in susceptibility to these chemicals. Often they are applied in overdose, also resulting in the contamination of the home environment and possibly enters the human body either through ingestion or inhalation. Inhalation is 40 times dangerous to ingestion. Thus these chemicals first hit the target and then bounce back with a super hit on man. Insects usually infest unkept areas. A neat up-keep of the home environment will help keep the insects off to some extent, thus reducing the use of these chemicals.

Cigarette smoke is a frequent chemical contaminant in the home environment. It contains about 2000 parts per million of carbonmonoxide, the effect of which have already been discussed. Along with carbonmonoxide, it also contains compounds like 3,4 - benzopyrene, benzophenanthrene, Indinopyrene, dibenzo carbazole, methyl cholanthrene etc., all

carcenogenic in nature. 3,4 benzopyrene is a mutagen also. Giving up smoking is simply protecting the body from unnecessary torture and also an environment friendly living as it prevents the build up of dangerous chemicals in the environment.

Use of medicine without proper prescriptions is another deplorable tendency. Medicines are health guards only when used to prescription, on the other hand they act only as chemical burdens to the body and results in systematic malfunctioning. Individual ill-health is an environmental problem as the individual is an interacting element of environment.

In social life a large number of examples can be cited as environment unfriendly activities which can be avoided if the individual reaction to the problem of pollution is in the right direction.

Conclusion

While environmental awareness and awakening have forced the inclusion of environment as a subject in governance, individual life styles, attitudes and behaviour pressurise policy makers to dilute invironmental considerations to satisfy social desires. That is the conflict between environmental protection and development planning. Clearly, the soultion to this dilemma should come from the individual itself.

This paper was only circulated among the participants during the conference

ENVIRONMENTAL SANITATION - A CASE STUDY

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Introduction

The health status of an individual community or a nation is determined by the interplay and integration of two ecological universes. The internal environment of man himself and the external environment which surrounds him. Diseases are due to a disturbance in the delicate balance between man and his environment.

All things that surround us on earth are included under environment. Living organisma survive by adjusting themselves to the environment. It is therefore necessary that these cycles are maintained unimpaired. The air, the water, man and animals, plants and planktons, the soil and bacteria are all interlinked in a life sustaining system called the environment.

Any perceptible change in any of these factors which may interfere with the above mentioned rythm and cycle are called pollution.

Sanitation is referred to as "The Science of safeguarding health." World Health Organisation defines environmental sanitation as the "control of all those factors in man's physical environment which exercise or may exercise a deleterious effect on his physical development, health and survival".

From the villages of the interior to the large metropolitan cities environmental degradation is affecting the lives and health of people in our country. Most of the diseases and deaths in developing countries are due to the unavailability or inadequate use of drinking water and sanitation facilities. A concerted effort has to be made at all levels to prevent pollution and environmental degradation.

Thus the relationship between the environment and health is an established fact. Clear air, water and soil are the vital ingredients for a healthy life. Their abundance have a direct bearing on the quality of life and yet one finds environmental degradation progressing at a frightening pace. Provision of clear water and sanitation facilities are important for improving the health status of all. UNICEF estimates that about 15 million children below the age of 5 die in the developing countries every year. The absence of safewater and sanitation play a major part in this tragedy.

The progress of civilisation has steadily destroyed our natural global heritage. The air and water have been polluted by acid rain the ozone layer of the atmosphere depleted and the land denuded by deforestation and soil erosion.

Environmental sanitation in Indian context.

India is the seventh largest country with good number of religious, commercial, lingusitic and cultural groups. According to the 1991 census India has the 2nd largest population in the world. This gives an average density of 267 per sq km.

The massive population growth outstrips economic development, retards social development and make curshing demands on civic amenities, resources and the bearing capacity of an increasingly diminishing environment.

The basic problems of safe water supply and sanitary disposal of human excreta are yet to be solved. Much of the ill health in India is due to defective environment. It has been calculated that India looses 180 crore person hours each year due to diseases related to water and sanitation alone. Therefore health is the prerequisite to the development process and productivity.

India is blessed with her natural resources. But man the one who supposed to preserve the nature for future generation is destroying it in many ways. Rapid reckless industrialisation added more to it. The move towards development ignoring its adverse effect on environment. The improper use of these natural resources may lead to water, air and soil pollution ultimately leading environmental insanitation. By and large India is getting polluted day by day.

Many of the rivers in our country are accumulated with heaps of pollutants. About 73 million workdays are lost due to water related diseases. According to scientists at the National Environmental Engineering and Research Institute, the Ganges despite its high self purification capacity is among India's most polluted rivers.

Community wastes from human settlements account for four times as much waste water or industrial effluents. Most of these wastes are discharged untreated into the water sources. Out of India's 3119 towns and cities only 217 have partial (209) or full (8) sewerage and sewage treatment facilities. The implication of such massive pollution for the health of the nation are extremely serious. According to one estimate two third of all illnesses in India are related to water borne diseases.

In 1955-56 pollution of the Yamuna river resulted in 40,000 cases of Jaundice in Delhi and a few hundred deaths in 1978, 2000 attacks of Jaundice were reported in Bombay due to pollution of water. In poor communities diarrhoea and dysentry have become part of life.

Water pollution severely affects aquatic life also. Occurrences of massive fish kills have became a common feature in various parts of the country.

Air is a precious natural resources without which life cannot be sustained for more than a few minutes. Human activities like industrial production, motor transport and domestic burning of fuels are adding large amounts of harmful pollutants to the atmosphere. India's premier pollution research institute claims that 60% of Calcutta's residents suffer from respiratory diseases because of air pollution. The current car and two wheeler boom in Indian cities could

choke thousands to death. Delhi's half a million motor vehicles spew 400 tones of pollutants daily. In Bombay, a municipal survey shows that air pollution is a major cause of tuberculosis and various respiratory ailments. Clean air is a rare phenomenon in large Indian cities. The world's worst air pollution problems could be the woodsmoke inhaled by rural women while cooking. Even today over 90% of households use wood, dung and crop residues as fuels. Which generates even more pollution. Rural poor are the main victims of these cases. Plants too are affected by air pollution.

Soil is subjected to contamination in present time as a result of the unscientific cultivation and management in the farming systems. The main agents which attribute to the soil pollution and consequent degradation of the soil are soil erosion, leaching, excessive use of pesticides and other chemicals used in the cultivation, sewage and other sludge materials left into the soil etc. They issue damage to the soil eco system and resulting change in the structure. These inturn are carried in to the water through the streams where drinking water is polluted very badly and this has a direct impact on the health of the rural population.

It has been our experience that health education coupled with community organisation bring about remarkable changes in the attitude and life style of villagers as a whole with regard to sanitation. It was very evident from a recent study we conducted in two nearby villages.

Area of study

The villages selected are from Idukki Dist. In the state of Kerala situated in southern part of India. Kerala enjoys a special status in the country with reference to standards in literacy, health, social welfare activities and womens education.

However, the scenario in Idukki is different. Idukki is the largest district (4998 sq.kms) in the State with many problems especially one of ecological nature. Idukki which was once full of thick forest was converted into agricultgural land over a period of four decades. Steep areas were converted into agricultural land and were subjected to intense soil erosion because of the high rainfall received in the area from both south - west and north - east monsoon. Productivity of the land is very low and the availability of water is reduced. The whole region is now passing through a process of environmental degradation adversely affecting the productivity of land and the quality of life of the people. It is therefore to be seen that idukki district now represents a region within Kerala where the problems brought about due to ecological changes have not only affected the economy but also the quality of life of the community existing in the area.

The two selected villages namely Kappaluvenga and Kanayamkavayal lie close to each other. Kappaluvenga is a new settlement with 120 households. Majority of them are daily labourers. Intensive community organisation was done by an NGO in this village.

People are highly organised and degree of socialisation is comparatively high in this village. The organisations are Grama Vikasana Samithi, Mahila Samajam, Youth club, Balavadi, Harijan Grama Vyavasaya Sahakarana Sangam. Weekly meetings conducted by these groups are another important fact.

In Kanyamkavayal too, people have migrated from other parts of Kerala and have settled in the last four decades. There are 368 households. Majority are small and marginal farmers. There are no organisations or groups which provide opportunity for people to come together.

Though both these villages have more or less the same economic and educational background they showed striking differences with regard to their attitude towards health, sanitation and the need for infrastructure facilities.

The study was conducted in 20 households in both the villages selected by random sampling. The results regarding their health awareness is tabulated below.

Awareness of respondents regarding health and sanitation practices.

Sl.No.	Desirable practice	Level of Awareness	
		Kappalu venga	Kanayam kavayal
1.	Keeping drinking water separately	100%	89%
2.	Choose well water for drinking	91%	79%
3.	Contamination of water can be avoided by filtering & boiling	97%	63%
4.	Having sanitary latrine and its proper use	67.4%	6.7%
5.	Sanitary latrine is a must for every household	96%	32%
6.	Aware about hook worm infestation	85%	44%
7.	Awareness about the need for proper ventilation	62%	39%

Eventhough in both the villages factors such as education, occupation and economic status were almost the same, remarkable difference was noticed in Kappaluvenga with regard to the attitude towards sanitation. This intrigued us to study the reasons for it.

The respondents of Kappaluvenga explained that major changes have occured in their attitude

and awareness towards many aspects of life since they began to have strong micro - level organisation. All of them are members of one or more organisations and many of the information and the ability to practise them are attributed to community development work going on in the village.

The following factors found in Kappaluvenga were responsible for the difference between the villages.

a. Micro level organisations
b. Peoples' participation and co-operative movement
c. Regular weekly meetings of the micro level organisations
d. Homogeneous system of cultivation.
e. Conscientisation programmes and financial assistance by NGO were found to have influenced their thinking.

A deeper analysis of these factors point to the basic fact that whether it is sanitation or education or whatever, a political will is essential for improving the statusquo. The poor are often blamed for lack of hygiene and for pollution. But who cares about providing facilities for them is the question.

Both the villages studied, come under the catchment area of Idukki dam, the biggest hydro electric project of Kerala. Both the villages are not yet electrified and the only bus which ply to the village once a day is a recent development. Hence they have to pay more than others for any infrastructure development. The point here is the relationship between health and sanitation and social justice. Hence while thinking about global environmental issues we should not forget the basic needs of our fellow citizens. "Think globally and act locally "may be a very apt maxim that should guide our thinking and planning.

This paper was only circulated among the participants during the conference

MEDIA AND HEALTH PROMOTION

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Communication is the basis of all social inter-course. The process of communitcation is intimately connected with the overall fabric of social system. Hence it is difficult to comprehend social life in the absence of communication system. The development of human civilization depends directly on refinement and growth of forms, mechanisms and quality of the contents of communication.

The word communication is derived from the Latin varb, communicare, which means to make common, to share, to impart, to transmit. Thus the role of communication is to break down the barriers in the way of human interaction in order to achieve mutual understanding. For transmitting knowledge, disseminating facts and directing various emotional appeals to influence rural public the mass media have assumed vital importance.

Communication is now being viewed as an important key to the process of social development and transformation. All types of development, be it personal or national, in any field for eg; health, depends mainly on the success of communication. The mass media deal with day-to-day problems and affect the destiny of a nation, in particular, and humanity, in general.

It is because all actions and events have communicative aspect as soon as they are percieved by human beings. Such perception changed the information which an individual possesses and therefore, influences him. In this context mass media as an agent of communication has paramount importance in our society. The role of mass media in health development is not only to inform and create awareness among the public or society but to implement the new ideas and attitudes which cause change.

At the present stage of rural development particularly in the health improvement aspect when the technological know-how is available for taking great strides forward in rural India it is the human element that is to be exploited for the development. The key to the rural devlopment lies in the mind, heart and hands of the rural people. To swing open the doors to health promotion of the rural people, motivated technology is inevitable. The uppermost force which accelerates the development process is the effective dissemination of adequate information.

Communication is, however, an uphill task in the rural areas because of high rate of illiteracy, customs, traditions and other prevailing constraints. In such a situation the health improvement, a great challenge, can be successfully met with the support of media. Through its effective communication of right information, the rural people even at the remote places can be convinced about the utility of the information. There is so much to know in the health area which rural people need to know and hence there is a greater necessity to have new means of communication for fast flow of scientific information on health. The success of health

promotion of rural people mainly depends on quick dissemination of innovations in an intelligent and compatible manner. The communication of innovations and promotion of usage of these techniques do promote health improvement. Without a sophisticated and efficient development of communication, the base of health improvement programmes needed in rural society cannot be established.

The problem of unsatisfactory improvement of health status of rural people does not seem to be with the potentiality of modern scientific and technological know-how of health but with its effective transfer to the clientele. If proper encouragment and adequate exposure to new scientific knowledge in the field of health is given to them, the health of the rural folk can be improved without much cost. It will be beneficial to the rural mass if health information is provided to them through mass media in the form of classes or lectures, so that they are able to understand them properly and are able to take necessary decisions so as to adopt them for their benefits.

The message given to the rural people through media is more likely to be accepted readily if the same is recieved form two or more different and highly credible sources.

For the advancement of rural people in the field of health through mass media, the existing socio-economic and cultural mileu should be clearly understood. Such a mileu should be gradually over -powered by the application of scientific and technological information about health, particularly by the identification and planning of natural resources for the better utilization of the same , with a view to enhance the health improvement process.

Communication process does not necessarily mean total rejection of traditional values and acquiring modern ones but emphasizes the need for recrystallization and utilization of traditional media, such as puppetry, folk songs, dramas, street plays etc. in disseminating information about health to the disadvantaged group of the society - the rural mass.

Development of communication infrastructure permitting the flow of informations throughout a rural society is an important pre-requisite to their health improvement. The health information should be related to the felt needs of the people and should also be able to create a mental picture in their minds.

An effective communication has to provide continuous learning situation in which rural people could develop better understanding for the adoption of new information. A developing country like ours needs a very effective mass media to bring about desirable changes in health promotion especially among rural people who form the majority of our population. But the event to which the scientific and technical information regarding health reaches the rural people through effective communication remains unanswered.

Though the role of mass media in health improvement of rural people has been much talked about, very little has so far been utlilized to upgrade their knowledge, attitudes and skills regarding the health aspects. In the present era of scientific advancement, a steady flow of information about health through appropriate media is a must to bridge the gap between the latest scientific information available and its adoption by the rural people. It is in this context

the communication of information exclusively for rural people assume special significance.

In the light of above, it is useful to analyse the role of mass media in regard to the recent incident of plague in India. Though the media has served to a great extent in creating awareness among people about plague so that they were able to take preventive measures, the exaggerated reports by certain media paved way for creating panic among the people. As a nation, India's socio-economic status has been sullied by the outbreak of plague, the precautionary measures taken by other states in India and countries served the purpose of disrupting the spread of plague among other people. Critical analysis of the role of mass media in the above subject reveals the fact that, eventhough the media has sullied the socio - economic status of India to a certain extent, it has served the purpose of promoting the health status of the mankind as a whole. Factual reporting and dissimination of correct health information can allay public apprehension, create an environment of rationality and encourage public co-operation in health problems.

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ROLE OF EDUCATION WITH REGARDS TO ENVIRONMENTAL HYGIENE AND PROMOTIONAL INITIATIVES

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Introduction

Literacy being declared as 100% in Kerala, I was curious to find the knowledge mothers had regarding simple living habits, planning of menu and also to find out their level of information regarding current matters. I was particularly interested in the relationship between education status of mothers and its corelation with ability to gather correct information and implementation of this information in practical living. Because literacy, knowledge and wisdom though related are indeed different aspects of the same coin.

Material and method

An effort was made to interview mothers while they came to drop their children at school. This time was selected because mothers are free at this hour. Having taken care of the family needs in the morning they are free to chat and be free before the next session of work at home.

The interview was followed by a spot test with three simple questions. They were given a piece of paper and pencil and place and wrote the answer in twenty minutes. The questions were as follows:

1. What is meant by balanced diet?
2. What are the water - borne diseases?
3. What is the mode of spread of weils disease?

The papers were collected and at a later fixed date an open discussion was done with these mothers. Though fifty mothers were available for the test, eighty attended the discussion. The discussion was very lively. Each mother stood up and asked doubts.

During this session I had the chance to teach them wholesome menu. Menu consisted of simple available things during season. I was also able to tell them as to how to organise their work. This would enable them to spend time with children and husband without being busy in kitchen when they needed them. A detailed demonstration and description of hand washing was done and how hand washing and nail clipping prevent Orofaecal route was told. Mothers were also told to teach and insist hand washing by family before they started meals.

Analysis of Data

92% of the women were between age group (25-36 year) 8% being above 40.

66% had 2 children, 24% had 3 children, 8% had one child and 2% had 4 children.

Education-wise 58% had finished school, 8% pre-degree course in college and 2% Bachelor or arts, 4% were below IVth Std. and 28% between IVth & IXth Std. Regarding husband's occupation 52% belong to manual worker group, 4% technical worker and 8% white collar group.

Discussion

The knowledge regarding the first question i.e. what is balanced diet? was fairly good. About 70% gave correct answers. 30% emphasised only on aspects like milk and egg. This was rather surprising. Nutrition education has been available to the public for a long time and I had expected mothers to score better on this topic.

Regarding water borne disease, all came out with diarrhoea as was water borne but were not sure of diseases like hepatites, polio and weils.

Regarding weils disease only 4% gave correct answer. They happened to be the ones who finished school and went to college. Most women believed that weils spread through intake of food contaminated by rats' or rhodent urine where as it actually spreads by the direct contact of contaminated water with broken skin i.e. contaminated with urine of rat/rhodent. Even prolonged contact with this water can infect man.

Most mothers were unaware of the importance of toilet training in preschool days. The teachers also commented and requested me to tell more on this subject.

Summary

Public Education and media play an important role in spreading information. This leads to two important deduction. The first one being the information given by the media or by health education should be correct. So the media personnel and those involved in health education have an obligation to the society to gather correct information. For example everyone knew that rat had something to do with the spread of weils disease in Kerala. But not many knew how to prevent it. Secondly the message must be very simple. The oral rehydration therapy with it's simple message of hydration with home available fluids has changed the dreadful consequences of dehydration and only 1% of the diarrhoea disease became hospitalized. 90% being treated with home available fluids and 10% with oral rehydration salt threapy.

The need for environmental hygiene as public effort needs emphais. This is now considered as duty of the municipality. Women are happy to sweep their homes and put garbage over the walls or onto the street. Shop keeper litter the drains with paper and cloth-These habbits block the drains and help rhodents to thrive.

The eager response of mothers show that mothers are willing to talk and gain knowledge. Plague

and weils helped the crowning of rat as king. Public is eager to save themselves and their children from such disaster. This ripe and receptive soil should be utilized to spread correct and simple information regarding role of environmental hygene and health.

My Suggestions are as follows:

1. The preschool curriculum should consist aspects on toilet training and hand washing as early learning will cause a permanent habit in young mind.

2. During mothers meeting topics of use with regard to environmental hygiene should be talked about.

3. Teachers handling children in nurseries and lower primary schools should be given special training to enable them to teach and handle young children well.

4. Media that is appreciated by all must be used to spread correct information in a very simple mannr.

Table No:1

Table showing classification of mothers according to age and No. of children having.

Age group	No.of mothers	No.of mothers having children				Total
		1	2	3	4	
25-28	13	2	10	1	0	13
29-32	15	1	9	5	0	15
33-36	10	1	7	1	1	10
37-39	8	0	5	3	0	8
40 & above	4	0	2	2	0	4
Total	**50**	**4**	**33**	**12**	**1**	**50**

Table No:2

Table showing classification of mothers according to age and educational status.							
Age group	No.of mothers	Educational Status.					
		Below Primary	Primary & above	SSLC	PDC	Degree	Total
25-28	13	0	2	9	1	1	13
29-32	15	0	8	5	2	0	15
33-36	10	0	2	7	1	0	10
37-39	8	1	2	5	0	0	8
40 & above	4	1	0	3	0	0	4
Total	**50**	**2**	**14 29**		**4**	**1**	**50**

Table No:3

Table showing classification of mothers according to age and husband's occupation.					
Age group	No.of mothers	Occupational Status of husbands			
		Manualwork	Regularsalaried employee	Technical worker	others
25-28	13	8	2	1	2
29-32	15	9	1	1	4
33-36	10	8	1	0	1
37-39	8	1	0	0	7
40 & above	4	0	0	0	4
Total	**50**	**26**	**4**	**2**	**18**

Table No:4

Table showing classification of mothers according to age and other knowledge in health aspects.

Age group	No.of Mothers	Health Knowledge		
		Know about balanced diet	Water borne desease	Weils
25-28	13	10	11	6
29-32	15	12	14	6
33-36	10	8	7	5
37-39	8	3	4	2
40 & above	4	2	2	2
Total	**50**	**35**	**38**	**20**

NATIONAL STRATEGY ON PROMOTION OF ENVIRONMENTAL HYGIENE IN INDIA

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The need to protect and preserve our environment has been felt all over the world in recent years. The deterioration of natural resources due to industrialization and the unplanned harnessing of land, water and forests in the past is posing a serious threat to mankind. The problem of water and air pollution has given a new dimension to the issue of a safe environment. Toxic hazards, such as the use of pesticides in crops, the use of insecticides and rodent control chemicals for storage of food grains, have led to the contamination of food articles and wreaked havoc on the health of mankind. But above all these, the greatest and constant danger to human life is from diseases caused by unhygienic sanitary practices.

Until the beginning of the last decade, not much attention was paid to the role of environmental sanitation in the promotion and preservation of the health and welfare of the people. Despite the government's best efforts, not much could be achieved in the sanitation sector. In India, the last decade (International Drinking Water and Sanitation Decade) ended on a note of small success in the construction of sanitary latrines through government efforts, viz., just three per cent in rural households. According to recent reports, only 14% of the rural population has access to sanitary latrines, as a result of the efforts of the Government, NGOs and private initiative. It is evident that 86% of rural households do not have any access to sanitary latrines. Infact, according to rough estimates, 120-130 million households, out of a total of 150 million households, are without sanitary latrines.

Throughout the countryside, the sight of men, women and children defecating in the open is simply one of the facts of rural life. It is easy to attribute this to centuries old taboos and beliefs, but the crux of the issue is the lack of sanitary latrines and the lack of awareness about the intimate relationship between health and open defecation. The situation is worse in urban and semi-urban areas, where due to the mushrooming of slums and inadequate toilet facilities, there is open defecation in the lanes, bylanes, parks, and along the periphery of open drains. Pigs and other stray animals compound the health hazards in these areas. In the circumstances, it would not be wrong to say that individually Indians are the cleanest persons in the world, but collectively they are among the dirtiest.

In urban slums, the problem of human waste disposal has been compounded by the problem of the safe disposal of solid waste, which presents a fertile breeding ground for rodents and pests and poses a major hazard to the health of human beings. The recent outbreak of epidemics in the country has reinforced the concern for environmental hygiene. According to rough estimates, about 250 million kilograms of human excreta is dumped on land or consigned to holy rivers together with 900 million litres of urine, per day. Much of this huge quantity of human

waste goes untreated, and serves as a breeding ground for bacteria and other pathogens, bringing disease in its wake.

Thus, we have the enormous problem of the safe disposal of human waste coupled with poor hygienic practices, which together create an unhealthy environment and contribute substantially to the poor health of communities, especially children. Surveys have indicated that in any community, if open defecation is stopped and the people adopt hygienic practices, the Infant Mortality Rate (IMR) is substantially reduced. The link between health and sanitation is not always evident to a community. Hence, the changing of age old practices and attitudes is an uphill task. It becomes more difficult when improved sanitation is not perceived as a felt-need.

In our country, the problem of sanitation has been compounded by poverty, illiteracy, the caste system and the varied climate and terrain. The priority of the rural poor, understandably, is food, shelter and clothing. Throughout their lives, they struggle for these basic necessities, in this order of priority. In rural areas, they are compelled to accept garbage, litter, cowdung and stagnant water as a part of their environment. The problem becomes worse during the rains. What is more, most of the rural poor (those below poverty line) do not have land and water. In this scenario, sanitation ranks lowest in their priorities.

Sanitation is nowadays seen in a wider perspective, and includes personal hygiene, home sanitation, and garbage, excreta & waste water disposal. Although the concept of total sanitation was aimed at in a number of places, most efforts in this field have tended to focus only on the construction of sanitary latrines. This is mainly to prevent open defecation and provide privacy to the womenfolk.

In India, sanitation planning and strategy for environment hygiene is merely 50 years old. Although a number of efforts were made in the preindependence period for improving sanitary conditions, the first organized attempt with a national perspective was made in 1943 with the appointment of Bhore Committee, which was to look into the sanitary problems in the country. The Committee recommended the supply of safe and adequate water to all towns with a population of 50,000 and above in a period of 35 years and the construction of drainage systems within 10 years. Most of these recommendations remained unfulfilled. The recommendations of another committee constituted by the Govt. of India in 1948-49 (Environment Hygiene Committee), which recommended coverage of 90 per cent population in 40 years on environmental sanitation, met with a similar fate. In 1954, the rural sanitation programme was introduced in the First Year Plan as part of the health sector. During 1981, a decade long programme was launched with the aim of covering 25 percent of the population under the sanitation programme, but nothing much was done in the initial years of the decade.

In 1985, the Rural Sanitation Programme was transfered to the Department of Rural Development from the Ministry of Urban Development. In 1986, a major initiative was taken with the launching of the Centrally Sponsored Rural Sanitation Programme (CRSP). It aimed at constructing one million sanitary latrines with the objective of improving the quality of life of the rural people and providing privacy and dignity to womenfolk. This was intended to

supplement the efforts of the States. The programme provided 100 per cent subsidy for construction of sanitary latrines for SC/ST and landless labourers, and subsidy as per the rate prevailing in the States for the general public. The CRSP led to the creation of a consciousness among the implementing agencies, social scientists, voluntary sector and NGOs, people's representatives and opinion leaders,about the health hazards arising from unsafe water and insanitary conditions, and the need for environmental sanitation. This resulted in a number of successful models being evolved in different parts of the country by NGOs as well as by government agencies.

The Midnapore Model is based on locally available low cost technology and materials to suit the various income groups. The Periyar district model, implemented by government agencies, provides sanitation as a total package, and is need based with beneficiary participation and very high usage rate of latrines. The Sulabh Sauchalaya model involves motivation, promotion, education and community participation. The model evolved by the Environmental Sanitation Institute (Safai Vidyalaya), Ahmedabad, involves the generation of felt need, people's participation, simple yet appropriate technology before launching the programme of construction of latrines. The model of the Institue of Engineering and Rural Technology (IERT), Allahabad, and the UP experience are needbased with beneficiary contribution. The Alwar Model motivates the community to adopt a package of sanitary facilities and practices through a cadre of core change agents at village level with a State Government Department serving as promotor and facilitator. These are only some well known and successful models based on the efforts of social organizations, innovators, and dedicated Government functionaries in different parts of the country.

Multilateral and bilateral agencies gave technical and financial support for a number of sanitation programs, which were integrated with the water supply programs. The improtant multilateral donors were UNICEF, world Bank and UNDP, and bilateral donors were the Netherlands, Denmark, Switzerland and Sweden.

As the programme for the promotion of environmental sanitation was still in its infancy till the end of the last decade,it suffered from several shortcomings, such as inexperience, inadequate delivery capability, and the absence of well formulated strategies.

In 1989, the UNICEF conducted a KAP (Knowledge, Attitude, Practices) survey along with the National Drinking Water Mission, on the positive and negative perceptions of people about water, sanitation and health. The survey was an eyeopener for planners in the formulation of future strategies and overcoming shortcomings of the past. The KAP survey showed that on the positive side a close linkage is perceived between water, sanitation and health, but on the negative side, there is a bundle of misconceptions about sanitation.

At the beginning of this decade, the National Drinking Water Mission reviewed the entire sanitation programme and found that the reasons for the slow progress were mainly due to the (i) lack of initative at all levels; (ii) inadequate financial resources; (iii) poor perception of the importance of sanitation; (iv) lack of felt need from the people and (v) lack of people's participation. Based on the past experience and to formulate a new strategy, a National Seminar

on Rural Sanitation was held in September 1992 in New Delhi. The recommendations of the seminar were grouped under four broad areas, viz., sociological aspects; appropriate technology and R&D; institutional and intersectoral linkages; and human resource development, community participation and role of women.

The major recommendations included social mobilization and a decentralized, participatory approach; maximizing women's participation; involvement of NGOs at the community level; integration of sanitation programme with other related national and state programs; continuation of subsidy; introduction of the concept of total sanitation in school curricula; financial support for self employment for scavengers; legislative support for a ban on the construction of dry latrines; developing of appropriate guidelines for various technological options with different materials suitable for different geographical areas and socioeconomic conditions; closer linkage, co-operation and co-ordination among the Departments, organizations concerned with rural development, drinking water supply and sanitation, literacy, health care, social welfare sectors; establishment of a network of nodal training institutions for the purpose of human resource development.

On the basis of the recommendations of the National Seminar, new guidelines were framed in 1993 for the implementation of the CRSP, with the objective of achieving an integrated approach to rural sanitation. The new guidelines aim at the generation of felt need and people's participation. They provide subsidy to the poorer among the households below poverty line; encourage other households to purchase the facilities through markets, including sanitary marts; launch intensive campaign to establish individual sanitary latrines wherever possible; establish exclusive sanitary complexes for women; and encourage locally suitable and acceptable models of Latrines. The revised guidelines changed the subsidy pattern, limiting it to 80% for persons below poverty line for individual household latrines.

The basic thrust of the national strategy on environmental hygiene now is that sanitation should emerge as a demand, felt need from the people. Demand generation is crucial to success. For this, motivation is the key word, which is best achieved through information, education and communication (IEC) through the efforts of NGOs and people's participation. Government's main role is that of a facilitator and catalyst. However, it is committed to the subsidy for the rural poor under the CRSP guidelines.

Environment hygiene is not merely the construction of sanitary latrines. It is one of the essentail prerequisites for achieving the goal of Health for All by 2000. Without basic sanitation, the full benefits of safe drinking water cannot be achieved. Hence it is essential that all out efforts are made to provide sanitation facilities to the entire rural population and rural areas by the end of this decade. For this, rural sanitation must become a people's programme. There must be active involvement of the entire community, particularly women, at all stages of the environmental hygiene programme, be it planning, project formulation, or execution.

There must be generation of felt need and motivation through awareness campaigns with IEC as the principal tool for removing misconceptions and superstitions about sanitation. The awareness campaign must revolve around the concept of `Total Environmental Sanitation',

including safe drinking water; solid and liquid waste disposal; excreta disposal; home, food and personal hygiene; and environmental hygiene. The campaign must emphasize the linkage between health and environmental hygiene. The mass media and NGOs must be involved in the awareness creation and in community participation. The programme must give emphasis to safe, low cost technology suited to various geological and climatic conditions, as well as the needs and habits of people of various regions. Finally a nation wide movement must be generated and private initiative for the construction of sanitary latrines targeted. The panchayati raj institutions must be fully involved in the task of promoting hygiene and environment consciousness in relation to the community's health, dignity, and welfare.

This paper was only circulated among the participants during the conference

ROLE OF SCHOOL SANITATION IN ENVIRONMENTAL HYGIENE PERCEPTION AN OVERVIEW

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Despite huge industrial development and economic upliftment among the community in general, every year more than 2.5 million children die from various diseases that could have been prevented by sanitary intervention. Heavy investment made in water supply since 1980, but the resulting health benefits have been severely limited by very poor progress in sanitation.

Normally among various rural development programme and other activities in Rural and Fringe areas, low cost sanitation facilities and awareness campaigns have never been prestigious. Even professionals particularly those involved in conventional technologies avoid sanitation as a low-status, low-pay carrier in comparision to high-status, high-technology engineering or medical possibilities. Among affluent consumers low cost sanitation has no prestige in comparison with conventional water borne sanitation.

Even in cases where sanitation is promoted the approach taken is some times not relevent to the local needs. Generalisations are attempted to find simple universal solutions which mostly fail due to ignorance of diversity of needs and contents. In most cases technological options offered are limited and inappropriate and the behaviourial components of the communities are ignored in accepting the technologies.

In various Information & Dissemination campaigns the environmental hygiene promotions is based on message concepts which ignored existing knowledge, belief, convention, taboos and experience.
Children and women are the most vulnerable victims of lack of sanitation but men usually make the decision regarding tackling of the problem.

Many local customs ignore the children's excreta and these are a major source of diseases pathogens. Children need security in sanitation more than men yet they are unable to express these needs.

1. One of the major factors of dismally low coverage of rural sanitation programme in India can be traced to the non involvement or very little involvement of rural eductional institutes in the sanitation and environmental Hygiene Programme.

2. Since the concepts and technologies involved in Rural Sanitation has a very strong community behavioral component which contributes towards their active involvement, it is esssential that institutes/schools located in rural areas are involved in the programme through active participation of the student community.

3. Another area of lack of perception is the inability to appreciate the linkage between intestinal and other excreta related diseases and use of sanitary latrines. Since basic education plays a big part in reducing this lack of perception, the student community in their formative ages as in schools play a vital role in propagating the message through their own involvement.

4. Considering the influence of children on their parents in rural society and the village hierarchy, any demand of science & technology information through sanitary latrines/ soakpits/environmental sanitation, etc always gets a positive response.

5. Obviously one of the most effective ways of initiating this Problem Based Learning (PBL) as done in some other countries to develop and appreciate the Excreta Related Diseases and Sanitary Excreta disposal intervention is to introduce a Centrally Sponsored Scheme of School Sanitation and Health Programme.

6. Sustainability & Replicability of an effective rural sanitation programme depends heavily on the community appreciation of linkage between diseases and introduction of effective and scientific disposal system. This is ensured and made very convincing when their own children are involved in the programme.

Implementation Strategy

1. Health Through Sanitation & Water (HESEWA) implemented through learning institutions as sponsored in other countries is an effective way for sensitization and mobilisation of rural communities is actively solving sanitation related health problems.

2. The implementation stages may consist of :

(a) Identification of basic health problems of students in selected rural based schools/ institutes through the assistance of rural health centres/NGO's professionals.

(b) Ascertaining of causes of the health problems for each cases through professional screening and scientific classification of the causes.

(c) Liaison with parents to frame a programme of action leading to effective sanitary & environmental hygiene information.

3. Selection of area of study and the Participating Institution (PI) is to be made in consultation with local panchayat sabhapati (Adhyakhya) and also on the basis of no-intervention and high disease rate villages.

4. Selection & training of Village Health Workers (VHW)/ Rural Health unit Professionals/ Clinical staff/ Documentation & Data Entry operation staff through consultation with panchayats and Department of Health.

5. Preparation of slide/tape and visual modules highlighting the concepts and ER diseases and Excreta disposal system linkages and organising Appreciation programme for the motivators professionals screened for the purpose.

6. Organising Encounter Sessions with panchayats and Schools/hierarchy and teachers about the necessity of screening students having

health problems and identifying the excreta related victims for further action.

7. On identification of excreta related diseases, the village health team has to organise meetings/ discussions with parents of identified students advising them about preventive and protective measures including the sanitary latrine information in their houses.

8. On agreement with the parents the motivators alongwith professionals would have to examine the various options for immediate short term (like medical information) and long-term (engineering and technical information) steps required to correct the situation.

9. In cases, where the victim is not suffering due to any excreta related problems the parents should be advised accordingly by professional team.

10. Once the parents/panchayats/schools hierarchy agree on the proposal solution, the team will conduct KAP survey from time to time to evolve change with knowledge. Attitude and preference status in the villagers.

11. In case where scientific excreta disposal system is agreed upon, the local community polytechnic/PHED/NGO professionals might be assigned the job of installing and commissioning the technology.

12. Production of motivating slide/tape/video modes - at learning resource centres of Regional TTTI/community Polytechnics/other agencies like UNICEF/WHO.

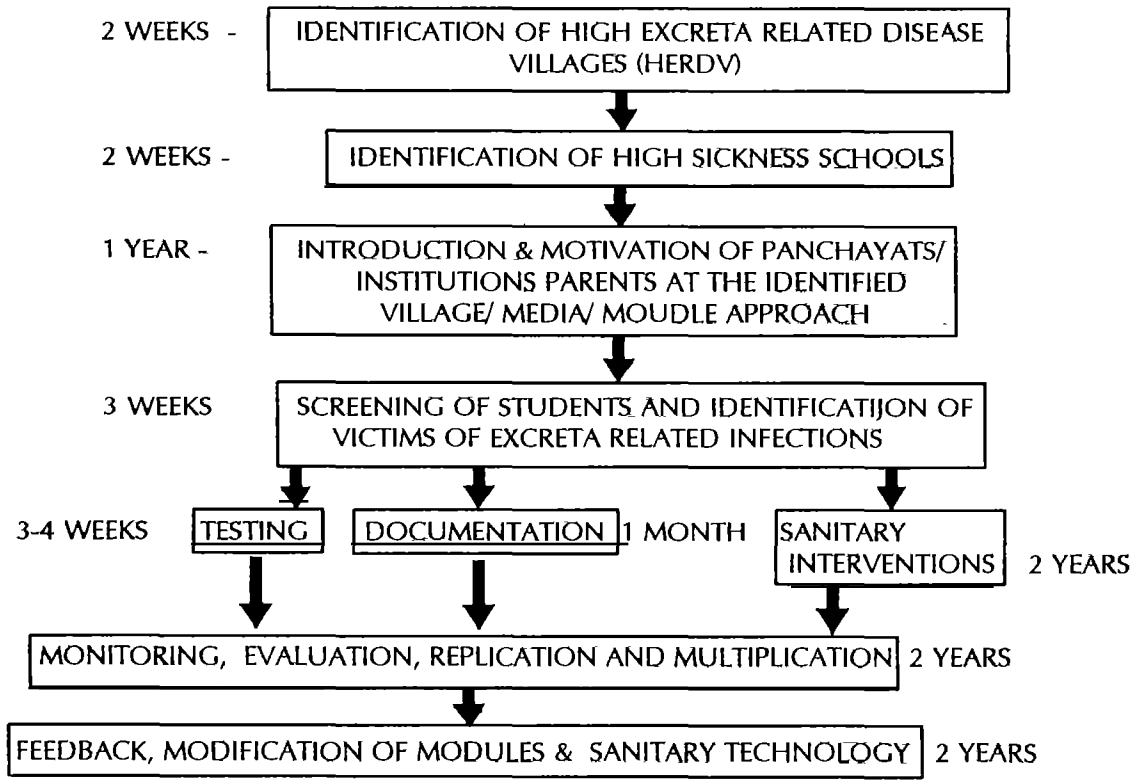
Monitoring and Evaluation

1. From six weeks onwards an effective system of monitoring the health system and the extent of the use of the waste disposal systems introduced have to be monitored on regular basis.

2. Local professional institutes like NGO professional may be assigned to prepare annual status papers for effects on the community, their health alongwith processing the encouraging demand for sanitation system.

3. Once a moderate success is achieved in reducing the excreta related diseases and increase with no. of excreta disposal system, the next target non-intervention villages (NIV) would have to be identified for multiplier effect.

ACTIVITY PROFILE
OF
SCHOOL SANITATION
AND
HEALTH PROGRAMME



METHODOLOGY

Stage - 1.

The Ex-officio programme officer from PHED/Panchayat or other Nodal Agencies is to co-ordinate with the dept. of health, Rural Health Units, Gram Panchayats to as certain the incidence of high Excreta related disease villages (HERDV) in the particular Dist./Block on the basis of available infomation, some primary and middle schools having a high rate of excreta related diseases among the student community. (20% above). Attempts are to be by the programme officer to authenticate information from other health sources/medical practitioners and paramedical work the block through interviews/discussions.

Stage - 2.

Having identified the institution and on being convinced about the excreta related diseases, which might be reduced through sanitary intervention the ex-officio programme officer is to organise awareness camps with UNICEF/WHO sources, adopted to local languages.

Stage - 3.

On identification of medical screening team consisting of professionals/paramedical staff and medical technicians first briefs the target group to fill up simple water & sanitation status format. (WATSAN FORMAT) for obtaining base line information on the existing status of

i. State of Latrine (if any)
ii. Soak pits
iii. Home Drainage system
iv. Re-face pits.

Selected members of teaching faculty, who may be included as volunteers to assist their pupils in filling up the formats. These would have to be processed by the Data Entry operators for preparation of a data base for the village/school sanitation.

Stage - 4

Preceding the screening of the students the screening team assisted by the teaching faculty will record the basic informations regarding (i) Name (ii) Sex (iii) Class (iv) Weight (v) Height. The data entry operator is to maintain appropriate information base. This is followed by the screening of the group in respect of:-

(i) Haemoglobin
(ii) Stool & Urine for immediate Microscopic Examination
(iii) Quick physical examination for clinical abnormalities.
(iv) Clinical examination including inquiry regarding episodes of diarrhoea in the previous month, eating habits, water use habit.

are to be followed for the collection of stool/urine samples and their testing.

The bacterial presence as seen through the microscope might be shown occasionally to the parents/students/Teachers to convince them about the preventive steps & sanitary intervention.

Stage - 5

On completion of the screening the screening group has to work on data analysis and report writing for the target group as well as for the entire school as a community. The team will have to identify the excreta related problems and prepare learning/motivating materials/modules for parents/motivating session for sanitary intervention. The parents of children having other major diseases are also to be advised/treated accordingly.

Stage - 6

In the parent motivating session (PMS) the individual report card is to be prepared to each parent highlighting the Excreta Related (ERD) Diseases and the effectiveness of sanitary intervention. Problem Based learning (PBL) and programed learning (PL) along with other adult teaching/ learning methodologies are to be applied for effecting necessary behavioural. Orientation for the parents so that they are able to:

* Identify the major health problems in their children & School.
* Appreciate the causes of the problems
* Understand the possible remedies of the problems and the need for sanitary intervention
* Formulate a programme of taken (POC) in respect of what is to be done in what time frame and how they are to be done.

Stage - 7

On identification of the programme of action, the programme officer along the with the technical supporting staff will have to identify the appropriate technology options for the sanitary interventions. Considering the local condition and availability of materials the available design options as maintained by the programme officer, will have to be adopted the common being the two pit pour flush latrine, the design depending on the available space in the household. For any problems the programme officer and his team at the local PHED / Panchayat office will have to provide all guidences to the village community.

Panchayat/Local PHED field staff/school authorities/parents village Health workers about the necessity of initiating immediate short term steps (screening, testing & treatment of the student victims) and long term actions like sanitary intervention in school itself (if necessary) and the homes of the suffering pupils. This will require a comprehensive media approach with Slide/ Tape/Video modules supplemented by non projected media like charts/photographs etc to convince the village & school hierarchy and the parents group. About the need of providing

from environmental and personal hygiene which includes sanitary latrines, soak pits, proper drainage and proper cleaning habits for the family. The Slide/Tape/Video modules will be ;made available through its pre-arrangeed availability at local professional/Technical Institutions involved.

School Sanitation if organised properly can be a very effective tool for need based multipilier effects in the local area which plays a vital part in sanitation promotion in the deprived communities.

ANNEXURE

Water and Sanitation Status Format (Watsan Format)

Format

1. Name of head of family :

2. No. of family members & their ages

3. Name of village/Block/Panchayat/Dist.

4. Name of school where the children are enrolled.

5. Basic occupation.

6. Income level

7. Type of water supply for the family.

8. Type of latrine (if any)

9. If yes, when constructed and how many family members using it.

10. Is there a soak pit, if yes what type? Specify

11. Is there a house drainage system? If yes what type? Specify

12. Is there a refuse pit, if yes, what type? Specify.

This paper was only circulated among the participants during the conference.

LOW COST SANITATION PROGRAMME - ANDHRA PRADESH EXPERIENCE

Dr.M.V.Bapiraj, Consultant,
Dr.P.V.Subba Rao, Project Officer,
Mr.M.Samba Siva Reddy, Project Officer,
RAJIV GANDHI TECHNOLOGY MISSION FOR RURAL POOR, HYDERABAD, A.P.

Andhra Pradesh is the fifth largest state in India both in size and population. As per the 1991 census the population of Andhra Pradesh is about 6.50 Crores and 1994-95 estimated population is about 7.50 Crores. 75% of the population lives in rural areas in about 27,000 villages and urban population in 109 municiplities and 6 municipal corporations. At the state level under the administrative control of the Chief Engineer Panchayat Raj, state level sanitation cell was formed to take up the low cost saniation programmes in the villages of the State with the active involvement of the UNICEF authorities. So far 9 districts have been brought under the present low cost sanitation programmes involving about 2500 villages. One of the significant factors noted is that about 8 voluntary organizations/NGOs in different districts have voluntered to come forward to take up the construction programme. The department has extensive plans to train the NGOs/voluntary organizations primarily interested in the low cost sanitation programmes, identify local masons and train them, the Engineering staff namely, the peripherals under these and the work inspectors are also trained in the low cost sanitation programmes. Under these programmes Rs.2000 are sanctioned for each unit. Government of India and the State Government contribute 40% each for the household latrine and the remining 20% by the beneficiary himself either in the form of cash, kind or material or even labour. During the year 1987-88 the entire amount was given as subsidy towards the cost of the individual latrines but subsequently the system was dispensed with and the beneficiary's involvement has been given priority so that the beneficiary would feel proud of having his own sanitary latrine and used by the members of his family. It was observed that the involvement of the beneficiaries was not there, the usage of the latrine was less than 50%. The Operations Research Group has conducted a survey in Krishna and W.Godavari Districts where in 10,000 latrines are constructed in 3 to 4 months. One significant observation is that the Collector's involvement in the implementation of the programme has yielded rich dividends and there is large scale acceptance especially in Krishna and W.Godavari Districts and about 25,000 applications are pending with these two District Collectors for sanction. The focus for the construction of the individual latrines is for those families who are below the poverty line. One of the local organizations by name Training and Development Centre has been actively involved in the training of non-Governmental Organizations in the sanitation package programmes with emphasis on low cost sanitation. As seen from the magnitude of the problem we have not been able to touch even the fringe of the problem but however we would like to say that the Government of Andhra Pradesh is very much committed to low cost sanitation programmes and on a priority basis. The Chief Minister of Andhra Pradesh announced that the Government of India and the State Government have sanctioned an amount of Rs.36.00 Crores specially for this project. The Chief Minister announced that 2.00 lakhs individual latrines will be constructed especially for the women and girl children in Andhra Pradesh. In all, the programme

is being implemented in 10 districts out of the 23 districts with a total cost of Rs.45.00 Crores. The UNIEF authorities are giving support for the construction of the sanitary latrines in 9 districts of the State by providing an amount of Rs.500/- for each sanitary latrine. Because of the active involvement of the District administration some of those beneficaries who were been to have a latrine but not able to give the proposed contribution, the District administration is coming to the rescue to provide a sort of loan through DRDA and DWACRA. With regard to the impact of the programme a survey was conducted by the Indian Market Research Bureau in the State and the findings were very much revealing. So far 1.63 lakhs latrines were constructed in the rural areas since the beginning of the programme.

Low cost sanitation programme in urban areas

In Andhra Pradesh there are 6 municipal corporations, 102 municipalities. About 26% of the state's population is living in the urban areas and it also includes the slums and slum dwellers. For the slums, a separate sanitation programme are organized and implemented with the ODA assistance. It is natural to have teething troubles in the implementation of this type of programme but the progress is very encouraging. Adverting to the municiplities the programme is being monitored, implemented and planned by the Commissioner/Director of Municipal Administration from 1992-93 onwards. Earlier it was under the administrative control of the Chief Engineer, Public Health. There are 5 schemes for the improvement of sanitation in these urban towns.

1. Vimukhthi Padakham (74 municipalities with Rs. 20.00 Crores expenditure.)

2. Centrally sponsored schemes with empasis on scavenging elemination (13 municiplities with an amount of Rs.7.00 Crores expenditure)

3. Again under the centrally sponsored schemes integrated low cost sanitation and rehabilitation of scavengers was taken up in Stage I with the finances of the Government of India and HUDCO loan and beneficiary's contribution. The amont spent for ths was Rs. 0.70 Crores. This programme was taken up in 22 municipalities in the Stage I, in Stage II 34 municipalities were taken and in the Stage II. A 44 municipalities were taken up. Under this programme the unit is constructed for use by 5 members and it costs Rs.2600/-. For 10 users the cost of the latrine is Rs.3000/-. In conclusion we are extremely happy to make a mention that every effort is put forth for active involvement of the community, NGOs, local leadership, Mahila Mandals, DWACRA groups, Youth, Nehru Yuva Kendras in the implementation of this low cost sanitation programmes and we are confident that in the coming years we will be able to actively involve many more NGOs in the State. The RGTM has organized a special training programme for the NGOs during 1994-95 to seek their support and cooperation in the implementation of model plans in the rural areas of the State.

RGTM experience in rural sanitation programme

RGTM is constituted by the Government of Andhra Pradesh as registered society under the

A.P.Public Societies Registration Act in the year 1992 with the objectives to take the science and techonlogy inputs to the door steps of the rural poor by acting as nodal agency for the voluntary organizations in the State. To fulfill its objectives RGTM has proposed the project of rural sanitation programme in Andhra Pradesh in selected 294 villages of AP selecting from each Assembly constituency at the rate of one from each constituency. To develop as a modal village in achieving 100% results in all the minimum needs sectors like agriculture, sanitation, medical, health education, housing etc. which can be replicated easily elsewhere in the State.

RGTM proposes to develop the model village as 100% results in the field of sanitation while taking the experience and advise of the other organizations who are involved in this field since long time. RGTM has conducted surveys and discussed with various organizations working in the rural sanitation programme like CAPART, UNICEF, SULABH INTERNATIONAL and other national organisations including various voluntary organizations in the State.

The concept of sanitation includes personal hygiene,rural sanitation, safe drinking water, garbage disposal, excreta disposal and disposal of waste water. It is a known fact and a reality that the latrines facilities are not available in most of the villages. Presently in all the villages the people are accustomed to open defecation which is creating unhygienic problems. Dry latrines are prevalent which require the services of scavenging services which are considered inhuman therefore, the urgent need is to put an end to this unsocial inhuman activities of the scavenging activity. In this direction RGTM has examined the causes of the failure and success of the existing types of sanitation.

Community latrine - The misery:

In this direction keeping in view of the drudgery of the user and scavenger community, latrines have been constructed on an experimental basis in rural areas. The dry type community latrines could not be used for more than two days as there were no facilities to clean them on regular basis. Even flush type community latrines have become symbols of insanitation and source of unhygienic conditions leading to epidemic and other consequent diseases.

Community latrine with an attender - An urban success

This is the time when Sulabh international introduced community latrines with an attender. These latrines were initially in railway station, bus stations and other public places where an attender maintains and cleans the community latrines for a nominal charge. This has proved to be very successful in public places of urban areas. However, there are some practical problems to replicate the concept of community latrines with attender in rural areas. Community latrines in urban areas have become a success because of continuos flow of floating population. Therefore, the attender is fully engaged round the clock both with the work and with income. Thus it becomes remunerative and occupational busy. In rural areas the latrines are normally utilized during fixed hours in the morning and to some extend in the evening. Therefore the peak load in the morning hours and some times in the evening and during the rest of the day when latrines are not under use. During this lean time when they are not in use, the attender tends to leave the latrines to attend to some other work. Therefore cleaning during

his absence is not done. Once the latrines are not found clean, people definitely hesitate to use such uncleaned dirty latrines. Thus the very purpose of providing latrine is defeated. Under these circumstances community latrine in a village is not a successful proposal.

RGTM New approach individual sanitary latrines - A successful experience

Under the above circumstances, Rajiv Gandhi Technology Mission felt that the only way is to provide individual sanitary latrines in each household with the financial/physical involvement of the family members themselves. This system of individual latrines has a number of advantages compared to community latrines or dry type latrines since the user family participated financially/physcially in the construction of latrines.

The advantages of individual latrines are as follows:

1. Since the latrine is constructed partly with their money, they have a sense of ownership. The latrine also becomes part of their own house.

2. Since it is used only by their family members, they keep it clean to avoid consequent epidemic diseases.

3. The latrine is available round the clock day in and day out and also in all the seasons.

4. It saves time for the women, this time saved will definitely be utilized by the women for the welfare of the family members.

5. It is easily accessible to the sick and old members of the family for their use at any time where as a community latrine away from their house.

6. The hygienic culture of the family improves and therefore youngsters will get to use this hygienic culture and extend it to other areas to maintain hygienic conditions and cleanliness.

7. The streets and the back yards will remain clean. Normally the children are encouraged to make use of the roadsides and streets in front of their houses and back yards to nature calls. Thus they become dirty. With the construction of latrine within the house the streets and backyards will be kept clean.

8. The latrine in the house perhaps is the only place to provide privacy to women. Normally the layout of the house in the village does not provide privacy during the day time. The latrine perhaps is the only place where privacy could be provided to the women and young girls during the day time.

9. The social status of the family will be improved.

Keeping in view the above in general and the excellent facility of privacy and time saving in

particular Rajiv Gandhi Technology Mission decided to go in for individual sanitary latrines rather than community latrines in 294 selected villages for 100% results in entire village.

Designs proposed by RGTM

Some of the designs propagated earlier by UNICEF, SULABH INTERNATIONAL to limit the construction of the latrine to the basement level only. The superstructure is left to the owner. Normally the owner provides a bamboo *'thatti'* or a jute cloth or some sort of temporary partition constructed with palm leaves etc. Even this has failed miserably as the life of such partition is limited to one season only. Even a small peep hole in the wall leads to hesitation by women for its use. It is therefore, felt by Rajiv Gandhi Technology Mission that a latrine with permanent super structure and roof shall be provided instead of latrine upto basement level. It is a one time investment and a lifetime comfort and a dire necessity to the women folk.

RGTM has conducted survey on sanitation and identified some of the above discussed problems facing in implementing the rural sanitation programme by UNICEF, SULABH and other national organisations. In the above process RGTM has developed a model and low cost individual sanitary latrine costing Rs.3000 per unit with superstructure using Bison panel which are made out of cement, wood particles manufactured by NCL industries. The superstructure could be erected with in hours by the local village carpenters.

The latrine consists of two pits. These pits are constructed by using cement rings, (or) Brick masonry (or) R.R.masonry depending upon the local available materials. One junction chamber is also constructed to connect the pits and the basis with stoneware pipes. Junction chamber, and sub-structure of latrine are constructed with brick masonry by using 1:6 cement mortar, and plastered 1:3 cement mortar. One A.C.Pipe is provided in junction chamber to circulate the waste gases produced from human excreta which is stored in pits.

Site Selection

For construction of individual sanitary latrines utmost care will be taken for selection of the site, keeping in view of the drinking water source and other factors to prevent contamination. RGTM model has been widely adopted during the awareness campaign conducted by RGTM at Nellore district with the involvement of the district collector of Nellore personally involving most of the voluntary organizations particularly women representatives. The Nellore District has **"Podupulakshmi" groups** where in the rural women folk are the members of the group who contributed daily/weekly/monthly their savings in community basis. They were the motivators for the idea for having individual sanitary latrines by each household in the villages among rural folk. Demonstrative individual latrines are constructed for in all the mandals of the district for satisfying villagers themselves of the usefulness of this latrines where the ladies and elders can easily go in for their nature calls providing privacy for themselves. RGTM has also introduced this type of system in Ratnagiri village of Bheemadevarapalli mandal where the Hon'ble Prime Minister of India Shri P.V.Narasimha Rao hails. There is a good response from the people of the district of Nellore as well as other parts of the State. As many as 10,000 families have paid @Rs. 500/- as their to the local officials (MDOs) in Nellore District for advance booking of their own sanitary latrine.

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DISCUSSIONS

Group Discussions

The recommendations detailed in the beginning of this source book emerged from the deleberations of Group discussions by five groups. Issues addressed by each one of the five groups are as follows:

GROUP - 1

HEALTH ASPECTS OF ENVIRONMENT AND ORGANISATIONAL STRUCTURE

1 What do you think are the major environmental health problems, based on your experience?

2 What type of interventions are necessary to solve the problem and how would you prioritise them if possible?

3 From your experience, could you suggest a package of interventions that might be appropriate to the rural/semi-urban community?

4 Which agency would you suggest and why, for taking up the responsibility for promoting rural semi-urban sanitation?

5 What organisational strengthening would you recommend to enable the agency discharge its role effectively?

6 What role would you recommend for voluntary agencies in promoting environmental health?

Participants for discussion on this issue were:

Dr.M.V.Bapiraju Sharma - Chair Person
Mr. R.Shivappa - Rapporteur
Mrs. Aleyamma Vijayan
Mr.N.K.Sunder Raj
Mr. B.Manoharan
Mr. Dipak Sompura
Dr.N.Sukumaran Nair
Mr. V.S.Sankaran Nair
Mr. V.S Ramachandran Nair
Mr. K.Surendran
Mr. Saji Sebastian
Mr. Benny Mathew
Mr. M.S. Shiva Reddy
Mr. Paul Calvert
Mr. M.Nizar
Mr. P.Janardhana Aiyar

GROUP - II

COMMUNITY INVOLVEMENT FOR PROMOTING ENVIRONMENTAL HEALTH

1 What are the key lessons you have learned-success and failures in promoting community involvement?

2 Do you think that the recently proposed 'Panchayat Raj' system can be used to promote Community involvement? if so, do you envisage any constraints and what steps will be necessary to remove the constraints and make it a success?

3 Water supply and Sanitation facilities are crucial to women and hence the need for their total involvement at all stages of the programme. Identify constraints inhibiting involvement and suggestions to overcome them.

4 Based on above, what working model would you recommend for promoting community involvement?

Participants in this group were:

Prof. Bhattacharya P.K.
Ms.Beena G.
Ms. Elizabeth Zachariah
Dr. Jayasree R.
Dr.James Samuel
Mr.C.O.Kurian
Prof.Vijay Kochar
Mr.Rajeevan
Mr.Robert P.
Ms.Vimala Kumari

GROUP - III

MEDIA TO PROMOTE ENVIRONMENTAL HEALTH

1 What are the mass media you have used and with what effect?

2 Is there any role for cultural idigenous media in the programme and if so, what are these and what will be the effect?

3 Who are the workers ideally suited for face-to-face communication strategy and how can these efforts be mobilised? Would you recommend a single or multi-media strategy?

4 Based on your experiences, could you suggest a media strategy for promoting environmental health in the rural/semi-urban areas?

5 What type of audio-visual materials you have found useful for Community education? Is there any need for production of new materials and if so, what are they?

Ms.Riet Turksma
Ms.Suma Mathews
Ms.S.Vijaya Lakshmi
Mr.K.K.Perumal
Mr.Jagmeet Uppal
Mr.Roy Joseph
Mr.Wilson.G.K.
Mr.K.Madhu
Mr.Jayasankar.S
Mr.G.Raveendran Nair
Mr.K.Padmanabhan Achari
Mr.R.Rajasekharan Nair
Dr.S.S.Jagnayak
Mrs.O.T.Remadevi
Dr.Babu Mathew and
Mr.B.B.Samanta were participants of this group

GROUP - IV

HUMAN RESOURCES DEVELOPMENT

1 What category of people and from what levels need to be trained?

2 Can the existing infrastructure take care of the training needs? Do you recommend decentralised training for front line workers and supervisors and also for community influential If so, how can this be organised and who will be the trainers?

3 What are the major areas to be stressed in the curriculum for training for different categories of workers? how will you assure the training is practically oriented?

4 Do you think that the environmental health with particular reference to water supply and sanitation and health education should be integrated with the basic training of engineers including diploma training courses? and the medical officers if so, how can this be done?

The following participants took part in discussing the issue.

Dr.K.Rajendran
Mrs.S.Chellammal
Dr.Sheela Noone
Mrs. Kochurani Mathew
Ms. Thresiamma Mathew
Ms. Lekshmi Bhaskar
Ms. Jaisy Joseph
Ms. Geetha Nair
Mr.Chandrasekharan.M
Dr.Radhakrishnapillai
Mr.Patel
Dr.A.S.Narayana Pillai
Mr.V.D.Vamadevan
Dr.K.A.Pisharoti

GROUP - V

INTER-SECTORAL CO-ORDINATION TO PROMOTE ENVIRONMENTAL HEALTH

1 What do you think are the major environment health problems based on your experience?

2 What type of interventions are necessary to solve the problem and how would you prioritise them, if possible?

3 From your experience - Could you suggest a package of interventions that might to appropriate to the rural and semi- urban community?

4 Which agency would you suggest and why for taking up the responsibility for promoting rural/semiurban sanitation?

5 What organistion strengthening would you recommend to enable the agency discharge it's role effectively?

6 What role would you recommend for voluntary agencies in promoting environmental health?

Participants of this group were:

Mr.Peter M.Flik
Dr.Lois Philip
Dr.Madhava Kurup
Mr.Tharakan
Mr.Mr.B.F.H.R.Bijli
Ms. Kalavathy.S.
Mrs.Fancy Prema
Mr.Issac John
Dr.K.Balachandra Kurup
Mr.Settappa.

ANNEXURES

Organising Committee

Dr.V.Ramakrishna
Regional Director, SEARB, IUHPE

Dr. Babu Mathew
Chairman,
6th National Conference

Dr.K.A.Pisharoti
Advisor, Technical Division, IUHPE

Dr.K.Balachandra Kurup
Organising Secretary,
6th National Conference

Scientific Committee

Dr. Babu Mathew
Mr. P.Subramonian
Dr. K.Balachandra Kurup
Mr. C.Ramesh Kumar
Mr. P.Harish Kumar

Exhibition Committee

Mrs. Kochurani Mathew
Mr. M. Nizar
Mr. K. A. Abdulla
Mr. C.O. Kurian

Media and Public Relations

Mr. C.Ramesh Kumar
Mr. M.Shajahan
Mr. V.Manilal

Travel and Accommodation

Mr. Isac John
Mr. George Varghese
Mr. Jayakumar

Reception

Mrs.Thresiamma Mathew
Mr. M.O.Varghese
Mr. V.Ravindran Nair
Mrs. C.G.Umadevi Amma
Mrs. O.T.Remadevi
Mrs. Sosamma Chacko

Food and light refreshments

Mr. V. Manilal
Dr. Babu Mathew
Mr. K.K. Perumal
Mrs. Geetha Nambiar

Registration

Mr. K.Padmanabhan Achari
Mrs. S.Vijayalakshmi
Mrs. Geetha Nambiar
Mr. P.Jayakumar

Finance Committee

Mr. P. Harish Kumar
Mr. B.F.H.R. Bijli
Dr. K. Balachandra Kurup

PROGRAMME-DAY 1

Inaugural Function

10.00 National Anthem	:	
Welcome	:	Dr. Babu Mathew President, Kerala Chapter, IUHPE
10.10 Presidential address and Release of Souvenir	:	Sri.K.Karunakaran Honourable Chief Minister, Government of Kerala
10.20 Inauguration	:	Sri. B.Rachaiah His Excellency The Governor of Kerala
10.30 Felicitations	:	Dr. K.A.Pisharoti Advisor, Technical Division, IUHPE
	:	Sri. N.V.Madhavan IAS Secetary to Government of Kerala (Irrigation & Water Supply) & Chairman, Kerala Water Authority
	:	Sri. K.Mohandas IAS Secretary to Government of Kerala, (Local Administration)
	:	Dr. M.A.Aleykutty Director of Medical Education, Kerala
11.00 Vote of thanks	:	Dr.K.Balachandra Kurup Executive Co-ordinator, Socio-Economic Units, Kerala Honourary Secretary, Kerala Chapter, IUHPE
11.15 Inauguration of exhibition	:	Sri T.M.Jacob Honourable Minister for Irrigation & Water Supply, Government of Kerala.
11.30 Keynote Address	:	Dr. Lois Philip Consultant, WHO, Geneva

11.45	Special address (RNE's view on the the conference)	:	Sri. Peter M.Flik First Secretary(Water&Sanitation theme of Royal Netherlands Embassy, New Delhi
12.00	Introduction of theme	:	Dr. K.A.Pisharoti
12.15	Presentaion of papers		
13.00	Lunch Break		
15.15	Tea break		
15.30	Presentation of proceedings of Day 1		
17.00	Cultural Programme		
19.30	Dinner		

PROGRAMME- DAY 2

09.00	Group formation		
09.15	Group Discussions		
12.15	Presentaion from groups		
12.30	Exhibition /Video film/informal discussions		
13.00	Lunch break		
14.00	Presentations to continue		
15.15	Presentation of proceedings Day-2		
15.30	Concluding remaks		
16.00	Valedictory Function:		
	Special invitees	:	Sri. Gopal Krishna Pillai IAS Secretary, Health & Family Walfare Government of Kerala
		:	Sri. Rudhra Gangadharan IAS Commissioner & Secretary Rural Development Government of Kerala
		:	Sri.K.Mohandas IAS Secretary, Local Administration Government of Kerala
		:	Mr. Peter M.Flik First Secretary Water & Sanitation Royal Netherlands Embassy, New Delhi
	Valedictory	:	Sri. C.T. Ahammed Ali Honourable Minister for Local Administration, Government of Kerala.

INAUGURAL ADDRESS BY SRI. B. RACHAIAH H.E. THE GOVERNOR OF KERALA

I am happy to associate myself with the National Conference on "Environmental Hygiene and Promotional Initiatives" being held here. Let me congratulate the organisers for selecting this topic which is of great relevance today.

The recent outbreak of 'plague' in some parts of the country has shown us what can happen if we do not have a cleaner environment. We could have avoided such calamities if the people were more aware and careful about the importance of environmental hygiene. It is often said that cleanliness is next to godliness. People should take every care in keeping themselves and their surroundings as clean as possible. But majority of the people living in rural areas have very little access to facilities that can maintain cleanliness. People are not aware, as they should be, about practices that are ideal to healthy living.

Promotional initiatives on environmental hygiene is particularly relevent in this context. I hope, in this two-day conference, delegates from all over the country and abroad, will exchange ideas, share experiences, suggest improvements and evolve programmes for promoting better health and environment. Co-ordination of all agencies involved in the development process is very important. The outcome of this conference should provide effective solution to improve our status in environmental hygiene. We should not forget that our country is densely populated and that our resources are limited.

World Health Organisation statistics has pointed out that 80% of all diseases are due to inappropriate use of water, and poor environmental sanitation. These include lack of disposal facilities of human waste and solid materials. Studies carried out by experts reveal that children below the age of five in India are most vulnerable to diseases caused by environmental pollution. It is reported that Malaria is also on its return to many States. This shows the urgency to develop innovative and low-cost environment improvement programmes.

Kerala has made much progress in the various sectors such as literacy, health

care, emanicipation of women, environmental sanitation and family welfare programmes. This state has also a long tradition of health care system due to an extensive net-work of health and educational institutions. The current scenario explains the need for increased coverage of water supply and sanitation programmes with the active involvement of the people. In the World Development Report 1992, it is stated that "investments in sanitation and water offer high economic, social and environmental returns." However these returns are realisable only with the effective utilisation of the facilities provided. It is in this context that attempt to mobilise people's participation in the water and sanitation programmes acquires vital importance. I am happy to note that the activities of the Socio-Economic Units, Kerala are in conformity with these objectives.

Let us not allow another deadly epidemic like plague or malaria to invade us once again. Let us all pledge that we will strive hard to make our nation healthy.

I wish the delegates and this conference all success.

JAI HIND

PRESIDENTIAL ADDRESS BY SRI. K. KARUNAKARAN
Honourable Chief Minister of Kerala

Excellency the Governor, Shri.Jacob, Dr. Lois Philip, Dr. Pisharoti, Friends,

I deem it is a great privilege to address this conference on "Environmental Hygiene and Promotional Initiatives" organised by Socio-Economic Units, Kerala and the Kerala chapter of the International Union for Hygiene Promotion and Education.

Let me add my own welcome to the delegates who have assembled here. I hope you will take back pleasant memories of your sojourn in this beautiful state.

When we think of environment and life, it is of prime importance that we have a good sense of hygiene and sanitation too. Because, quality of life can be improved only if people are conscious of the importance of hygiene, proper use and management of water & sanitary facilities and above all a clean environment. Government of India, under the leadership of late Smt. Indira Gandhi had given a good start to such a programme in the country during the International Drinking Water Supply and Sanitation decade (1981 - 1990) which was consistently followed up by late Rajeevji. The Technology Mission was established in 1986 during his regime giving special mandate for smoother implementation of drinking water supply and sanitation programmes. The mission also conceived an integrated philosophy to the drinking water and environmental sanitation scenario in the country.

India, rich in cultural heritage and Kerala, which we claim as "God's own country" attracts plenty of tourists from distant and neighbouring countries. Tourism is already a major industry earning substanital amounts of foreign exchange for the country. It is as important as preserving our country's traditions and values to keep it clean. Exploding population, ever growing industrial sector and increasing number of vehicles are major threats to the environment. But it is our concern for this conference that we are left too behind in terms of lack of well designed and wide spread distribution of cost effective low cost sanitation facilities through out the country. For the implementation

and management of such schemes the community should be consulted and they should be considered as the main actors in the programme. Only then can we expect to achieve sustainable development in this sector. I am very happy to announce here that the Socio Economic Units, Kerala have already evolved a strategy for involving the community in the planning, implementation and management of both water and sanitation facilities in this state.

Health statistics indicate that 80% of the diseases are found to be water borne. This is mainly due to lack of water and sanitation facilities and its effective use. Governmental attempts to improve the situation has many limitations. It needs no explanation that it is difficult to cater to a huge demand with very little time and even little resources. People of Kerala have realised the need for improved environmental sanitation and they are consistently working hard to achieve what was a distant dream until a few years back. According to the 1991 census, the coverage of rural sanitation in India is approximately 10% and for Kerala it is approximately 45%.

The Socio-Economic Units of Kerala, working hand in hand with panchayats has achieved around 80% coverage on environmental sanitation facilities in 42 panchayats all over the state with financial assistance from the Governments of Netherlands and Denmark. They have also plans to build another 50,000 sanitary facilities with people's participation in the next two three years. They have also succeeded in bringing together, various government departments like Health, Rural Development, Education, and Panchayats in contributing to the environmental sanitation programme. My government, in support of the programme, has shared financial contributions through various panchayats in the programme area. This has reduced financial burden of very poor beneficiaries in the programme panchayats. It is a matter of pride to all of us that even poor people, who are beneficiaries of this programme, have contributed money, labour or materials to the programme. Popular participation has been phenomenal and the demand is growing every year. This indicates how serious our people are, to attain improved quality of life.

I am also very proud of the fact that six panchayats in the Mala water supply scheme area, which is part of my constituency, was the first to have touched

the 80% coverage mark recently. I must say that the manner in which the programme is being implemented with people's involvement and participation is excellent. If we all act together in a systematic manner, it will not be long, before Kerala becomes the first state to achieve 100% sanitation coverage. Kerala, as we all know was the first to become totally literate. My Government has taken up, in right earnest, the issue of environmental improvement programme and a high power committee has been constituted under the leadership of the Chief Secretary. This committee consisting of four other Secretaries of the departments of Rural Development, Health, Irrigation & water and Local Administration is now in the process of preparing a detailed action plan for a cleaner Kerala which is to be implemented immediately.

This conference, I trust, will engage itself in serious deliberations to evolve a future plan and strategy applicable to all the States in the country. The delegates attending this conference, as I understand are experts in the field of environmental hygiene and related faculties from various states. It is for the second time that a conference on environmental hygiene and sanitation is being held in Kerala. This shows the State's interest and initiative in making environmental sanitation a cause. Now that there are many Governmental and non-governmental agencies engaged in activities to further environmental sanitation, the out come of this conference should, I am sure help in stimulating and intensifying the cause of environmental sanitation with public participation and promotional initiatives.

I have now pleasure in inviting His Excellency the Governor to formally inaugurate the conference.

JAI HIND

ADDRESS BY SRI.T.M.JACOB
Honourable Minister for Irrigation and Water Supply

It is a great pleasure for me to be with you in this august gathering in connection with the national conference on "Environmental Hygiene and Promotional Initiatives", which is organised together by Socio-Economic Units, Kerala and the Kerala Chapter of the International Union for Health Promotion and Education. At the outset, I would like to take this opportunity to thank the organisers for selecting this theme for a conference. I am sure the two days deliberations would be of great value to the Government of Kerala for developing a comprehensive environmental sanitation programme.

I am very pleased to note that an exhibition on women, water and sanitation is being organised as part of this conference as a way of marking respect to women who play a major role in all promotional initiatives on environmental hygiene and water handling and management. This is particularly relevant in the Indian context. At this juncture I have to announce that the recognition rendered by the Royal Netherlands Embassy to develop a package for demonstration purpose on how women are involved in the planning, implementation and management of various community managed water and sanitation programmes in this country.

As we all know, this Government has taken timely steps for the effective implementation of water supply and sanitation programmes. One of the classic examples is the announcement of the State Water Policy. This is the first State in India which announced and is implementing a State Water Policy. In this Policy, we have given emphasis to the protection and development of traditional water sources like wells and springs with the active involvment of the community.

Safe drinking water and disposal of human wastes are considered as two essential components of sound health. This Government has taken various measures to accelerate the completion of water projects in order to provide better services to the community in a speedy manner. However, the Govern-

ment can provide the required services only if the consumers made proper use of the facilities and considered it as their own. Now that some work has already been done and that the results were positive, I wish the trend continues so that it becomes easier for the government to build up more and more people's programmes.

Providing safe water and sanitation to every citizen is a time - consuming and expensive endeavour. In a State like ours, where resources are quite meagre and the population is quite dense, the government alone will not be able to make much headway. Such a situation calls for pooling of funds from various sources, motivation and participation of community groups on innovative and cost effective programmes could be a possible solution. This idea was seen as working in the SEU supported low cost sanitation programme, where panchayasts came forward with a contribution of 15-20% of their resources every year.

As you may be aware, we are building an international airport near Cochin with financial contribution from NRIs and the public. This government is genuinely interested in taking up all possible and innovative steps to cater the developmental demands of the people in the State.

Through such initiatives, Kerala has already built up local level implementation capacity with minimum external input. It is my own feeling that strategies can be evolved in the State, inviting contributions from public, business houses, banks etc. I do not think it will be difficult to attract such contributions for a genuine cause like water supply and environmental sanitation. What we need is a good programme with flexible mandate to attract people from all walks of life to develop this sector. We would like to have co-operation from many organisations like the Socio-Economic Units to support the programme. However, there are still some areas which require massive support, such as the coastal belt and the high ranges. Various surveys highlighted that the people in these areas are in dire need of both water and sanitation facilities. I may take this opportunity to mention here that our government is in an advanced stage of planning for "Cleaner Kerala" programme which will give special thrust to coastal and high range areas. Health for all by

2000 AD would still be a distant dream if we do not focus attention on the priority areas where water borne and other water-related diseases frequently occur.

I would be most interested in hearing the outcome of this conference and welcoming practical suggestions arising out of the deliberations. The government will give all necessary support for the implementation of innovative suggestions resulting out of this conference.

With these words let me conclude and declare the exhibition on "Women, Water and Sanitation" open.

JAI HIND

ENVIRONMENTAL HEALTH AND PROMOTIONAL INITIATIVES

Keynote Address
by
Dr. Lois Philip S.
Consultant, WHO, Geneva

Environment and Health

Two major determinants of health and well being are heridity and the environment. Of these two, the environment plays a significant role, and at the same time offers a greater scope for intervention.

Globally there is greater awareness and increasing focus on the environment leading to varying initiatives taken in the local, national and international arena. Ranging from potential threats such as depletion of the atmospheric ozone layer and global warming that threaten the earth to local problems of inadequate water, the environmental influences on the well being of mankind widens day by day. Environmental factors that affect life on earth include factors in the physical and social environment pertains to the elements of air, water, and soil that surrounds us and the social environment refers to people who make up society. May be we could include other living things such as animals, insects and plants.

In a World Bank Publication on World Development, environmental influences on health has been considered under four main heads, namely, household environment, occupational environment, ambient environment and road transport environment.

Health risks in the household in developing countries arise from poor sanitation, inadequate water supply, poor hygiene, inadequate garbage disposal and drainage, indoor and out door pollution as well as crowding.

The occupational environment poses health risks not only in the work place, both in fields and factories but also in the domestic front where women are affected greatly. Agriculture employs more than half the adults in developing countries and is found to be the world's most dangerous occupation. Apart form injuries they are exposed to disease-carrying animals and to poisonous agrochemicals. Mining and construction pose health risks and migrant and child workers suffer greatly. Small work places have low safety measures and often environmental control measures are overlooked by authorities.

The ambient environment when invaded by radiation and pollution of air and water pose serious health hazards. Industry, power plants, transport and use of coal pollute the air, especially in urban areas. In developing countries rapid industrialisation and mobility of population to cities and towns which can not keep pace with these developments, the situation is deteriorating rapidly. Harmful chemicals and biological wastes from industrial and domestic sources pollute

rivers, lakes and coastal waters. Individuals are exposed to natural ionizing radiation and to radiation used for medical diagnosis. Well operated nuclear power stations account only for a small amount of radiation. However, accidents and occupational risks to workers in nuclear industries and those working in radio-active mines are to be monitored and prevented.

The road transport enviroment accounts for motor vehicle accidents leading to injury and death. There is an increasing burden of such risks in developing countries.

Not withstanding the several health risks mentioned above from the domestic, occupational, ambient and road transport environment in many developing countries including India, the focus in environmental sanitation is mostly on water and waste disposal.

Impact of the Environment on Health

The impact of a poor environment on health has far reaching out come. In addition to premature mortality, a good part of the burden of diseases, consists of disability. Disability adjusted life year (DALY), is a measure used to assess the burden of disease. The DALY combines healthy life years lost because of premature death with those years lost as a result of disability.

In India, the DALY is 350 for every 1000 population. It has the second highest figure compared to other regions. Table 1 shows the burden of disease in developing countries because of poor household environments. This adds upto 338 Million DALYS per year. The table shows principal diseases and the relevant environmental problems involved, arising from pollution of water, soil and air.

Table 1.

Estimated costs and health benefits of the minimum package of public health and essential clinical services in low-and middle-income countries, 1990.

Group	Cost (dollars per capita per year)	Cost as a percentage of income per capita	Approximate reduction in burden of disease (percent)
Low-income Countries *(Income per capita=$350)*			
Public health	4 2	1 2	8
Essential clinical Services	7 8	2.2	24
Total	12 0	3 4	32
Middle-income countries *(Income per capita = $25000)*			
Public health	6 8	0 3	4
Essential clinical Services	14 7	0 6	11
Total	21.5	0.9	15

a. The estimated costs and benefits are for a minimum essential package of clinical services, as defined in the text. Many countries may wish if they have the resources to define their essential clinical package more broadly.

Source : World Bank Calculations

The lack of basic services such as water supply and sanitation in regions in India is the worst, where over 80% of the population are without sanitation services. Water supply appears to be in better shape, with over 20% without such a service.

Indoor air pollution is a very crucial environmental problem and is one of the four critical global issues. More people are exposed to air pollutants than to pollutants in outdoor air. While Delhi and Xian in China contains 500 micrograms per cubic meter of total suspended particulates, smoky houses in Nepal and Papua New Guinea have peak levels as high as 10,000 or more. Rural people, especially women and children suffer the greatest exposure and receive as much as two-thirds of the global exposure to particulates. This leads to acute respiratory infections in young children and chronic lung disease and cancer in adults.

In many cities, 30 to 60% of the population live in over crowded dwellings. Air borne infections and personal violence are a result of such crowding. Poor construction and structures lead to exposure to heat, cold, noise, dust and rain as well as to insects and rodents.

A burden of 36 million DALYS or 3% of the global burden of disease each year is caused by preventable injuries and chronic illnesses arising out of toxic chemicals, noise, stress and physically debilitating work patterns. Each year 32 million DALYS or over 2% of the global burden of disease is due to road traffic injuries.

Investing in Health

The health gains accrued from money spent on interventions vary. Some have a high cost per DALY gained while others cost less. Investments should therefore be made on a balanced package of public health measures as well as clinical services. Some public health initiatives have proved to be cost effective. They include among others immunization, programmes to reduce alcohol and tobacco consumption as well as to regulatory action, information and limited public investments to improve the household environment. However, government must do more to promote a healthier environment especially for the poor. Table 2 gives a picture of estimated costs and health benefits accrued because of a minimum health package in low and middle income countries. Where 12 dollars per head is spent per year there is approximately a 32% reduction in the burden of disease.

Table 2.

Estimated burden of disease form poor household environments in demographically developing countries, 1990, and potential reduction through improved household services.

Principal diseases related to poor household environments[a]	Relevant environmental problem	Burden from these diseases in developing countries (millions of DALYs per year)	Reduction achievable through feasible interventions (percent)[b]	Burden averted by feasible interventions (millions of DALYs per year)	Burden averted per 1,000 population (DALYs per year)
Tuberculosis	Crowding	46	10	5	1 2
Diarrhea[c]	Sanitation, water supply hygiene	99	40	40	9 7
Trachoma	Water supply, hygiene	3	30	1	0 3
Tropical cluster[d]	Sanitation, garbage disposal vector breeding around the home	8	30	2	0 5
Intestinal worms	Sanitation, water supply hygiene	18	40	7	1.7
Respiratory infections	Indoor air pollution crowding	119	15	18	4.4
Chronic respiratory diseases	Indoor air pollution	41	15	6	1 5
Respiratory tract cancers	Indoor air pollution	4	10[e]	*	0 1
All the above		338	-	79	19.4

* Less than one

Note. The demographically developing group consists of the demographic regions sub-Saharan Africa, India, China, Other Asia and Island Latin America and the Caribbean, and middle Eastern crescent.

a. The diseases listed are those for which there is substantial evidence of a relationship with the household environment and which are listed Appendix

B. Examples of excluded conditions are violence related to crowding (because of lack of evidence) and guinea worm infection related poor water supply (not listed in Appendix B)

b Estimates derived from the product of the efficacy of the interventions and the proportion of the burden of disease that occurs among the exposed The efficacy estimates assume the implementation of improvements in sanitation, water supply, hygiene, drainage, garbage disposal indoor air pollution, and crowding of the kind being made in poor communities in developing countries

c. Includes dysentery, cholera, and typhoid

d. Disease within the tropical cluster most affected by the domestic environment are schstosomials south American trypanosomiases and Bancroftion filariases.

e. Based on very inadequate data on efficacy.

Promotional Activities for Achieving Environmental Health

The World is facing new health challenges and despite the many remarkable improvements, a good number of the health problems still remain to be solved. Many are preventable. Though providing health services plays only a part in explaining the successes gained, it must continue to play an important role in the developing countries. Increasing income generation and education on the one hand thereby enhancing people's capacity to act, and bringing about technological progress enriching health services are two sets of promotional activities to focus on health in general and environmental health in particular.

For people in the developing world who are poor, household environment, carries the greatest health risks. In order to improve the environment governments would do well to undertake

activities such as providing information, reducing poverty and facilitating and stimulating non governmental sector action. If such promotional activities are pursued, potential health gains can amount to about 80 million DALYS a year in developing countries. With rising incomes and increased education of family members, improvements in the household are possible and better responses to intervention are elicited. A legal, regulatory and administrative frame work should be ensured by the government to permit the non governmental sector to act and make a contribution. The government also has the role to set standards and to disseminate appropriate information to the public. Identifying suitable individuals and parties and training them to take initiatives for an improved environment around households and in communities is also an area for government and NGOs action.

Occupational risks may be reduced through safety education of workers and managers, using appropriate technology and equipment and good managerial practices, legislation, regulation, incentives and investment in education, research and development are inputs to be made by governments. Working through workers organization has shown to bring good results. Progress can be achieved through tripartite agreements between workers, management and the government.

In addressing the case of polluting the ambient environment, policies and actions must focus on clearing the air in cities. Much depends on the source of pollution. Incentives and regulations to improve fuel quality and reduce traffic can be useful. Practices such as setting limits to lead levels in petrol and developing clean technologies can reduce industrial pollution.

Road safety can ensure less accidents at reasonable cost. Legislation, improved road structures, financial incentives and safety education can improve driver behaviours. A carefully designed package of measures can reduce road accident over a period of time.

Promotional activities to ensure environmental health are the responsibility of a number of sectors. It does not rest with the health departments alone. The Earth Summit in Rio de Janero has clearly defined the role that nations, sectors and individuals must assume to make the world a better place to live in.

When looking at responsibilities for promoting environmental health we may consider required activities under three main heads:-

- Advocacy efforts addressing those in authority in government and non-governmental agencies in order to ensure sound policies, pragmatic directives to transform policies in to actions and facilitate actions by providing funds, personnel and materials.

- Empowerment of the people to act by providing them with adequate knowledge and technical support, by identifying leaders and helping them to mobilize community groups for action.

- Ensuring societal support for a safe environment. Increasing societal awareness to identify practices that pollute the environment and to support individual and community activities that promote environmental health.

Session-1

Personal hygiene habits and associated factors

Chairman of Session : *Sri. Vijay Kochar, Honourary Co-ordinator Centre of Applied Social Research, Hyderabad.*

Rapporteur : *Sri. R.Ramanujam*
Dr. T.Vijayakumar

Paper 1 ENVIRONMENTAL CAUSES OF MORBIDITY : A CASE STUDY
Dr.R.Jayasree, Reader, Department of Women's Studies
S.P.Mahila University, Tirupathi, Andhra Pradesh.

Paper 2 TOBACCO AWARENESS ACTIVITIES IN KERALA
Dr. Babu Mathew, Professor of Community Oncology
Regional Cancer Centre, Trivandrum.

Session-II

Environmental sanitation and role of community with special focus on low-cost sanitation programmes

Chairman of Session : *Sri.B.B.Samantha, Sanitation Co-ordinator, UNICEF, New Delhi.*

Rapporteur : *Sri.K.G.Padmanabhan Nair*
Dr. Sheela Noone

Paper 1 COMMUNITY PARTICIPATION AND MANAGEMENT IN ENVIRONMENTAL SANITATION PROGRAMME
Dr.K.Balachandra Kurup, Executive Co-ordinator
Socio-Economic Units, Kerala.

Paper 2 THE EFFECTIVENESS OF POPULAR PARTICIPATION AND EDUCATION IN LOW-COST SANITATION PROGRAMMES - A CASE STUDY
Smt.O.T.Remadevi, Programme Officer
Socio-Economic Unit, (North), Calicut.

Session-III

Pollution and environment hazards

Chairman of Session : *Sri.L.Paneerselvam, India Country Team leader (RWSG) UNDP - World Bank*

Rapporteur : *Sri. Chunakkara Gopalakrishnan*
Ms. Biji Joseph

Paper 1 ENVIRONMENTAL HYGIENE AND SANITATION
Sri. Robert P. and Sri. Paul Calvert
Programme for Community Organisation, Trivandrum.

Paper 2 POLLUTION FROM HOSPITAL WASTE - OPTION FOR ITS ABATEMENT
Sri. V.S.Sankaran Nair, Engineering Consultant

Paper 3 TRIVANDRUM SEWERAGE - ENVIRONMENTAL HAZARD ON ACCOUNT OF LACK OF PROPER DISPOSAL FACILITY
Sri. B.F.H.R.Bijli and Sri. K.Padmanabhan Achari

Paper 4 POLLUTION AND THE INDIVIDUAL REACTION*
Dr. R.Raveendran Pillai, Environmental Scientist, Kerala State Pollution Control Board, Cochin

Session-IV

Media and its role for social change of environmental hygiene and promotional initiatives

Chairman of Session : *Sri.P.K.Natarajan, Associate Professor (Health Education) Medical College, Kottayam.*

Rapporteur : *Smt. O.T.Ramadevi*
Ms. Mridula Venugopal

Paper 1 HYGIENE EDUCATION AND MEDIA APPROACHES WITH PARTICIPATORY COMMITTEE BASED FOLLOW-UP
Sri. VijayKochar, Honourary Co-ordinator, Centre of Applied Social Research, Hyderabad.

Paper 2 PARTICIPATORY APPROACH TO HYGIENE EDUCATION*
Dr. Sumathy Rao, Secretary, TAMSEARB, Madras.

Paper 3 ENVIRONMENTAL SANITATION : A CASE STUDY*

Sr.Francina, Programme Director,
Peermade Development Society

Paper 4 MEDIA AND HEALTH PROMOTION

Dr.S.S.Jaganayak, Director, Southern
Institute for Social Science Research

Paper 5 ROLE OF EDUCATION WITH REGARD TO ENVIRONMENTAL HYGIENE & PROMOTIONAL INITIATIVES

Dr. Sheela Noone, Medical Lecturer
cum Demonstrator,
Health and Family Welfare Training
Centre, Kozhikode.

* Not presented at the conference.

List of Delegates attended the seminar on Dec. 19-20, 1994

1. Mr. Abdulla K.A*
   Head of unit, SEU (Central), Thrissur - 680 020.
2. Mrs. Aleyamma Vijayan,
   Coordinator, Programme for Community Organisation
   Spencer Junction, Trivandrum 695 039.
3. Dr. Anil S, *
   Dental Specialist, Dental College,Trivandrum- 695 011.
4. Mr. A.Arunachalam *,
   Dy. Chief Engineer, (PMU), KWA, Trivandrum - 695 011.
5. Mr. Augustus Xavier,
   Chief Executive, Centre for Appropriate Technology, 5, Jawahar Street,
   Nagercoil 629 001.
6. Ms. Anila Kumari,
   Field Organiser, SEU Trissur - 680 020.
7. Mr. Benny,
   Field Organiser,SEU, Thrissur - 680 020.
8. Ms. Beena G.,
   Field Organiser, SEU, Kollam - 691 020.
9. Mr. Binoy B.S.,
   Field Organiser, SEU, Thrissur - 680 020.
10. Dr. Babu Mathew,*
    Professor of Community Oncology, Regional Cancer Centre, Trivandrum - 11.
11. Dr. Balachandra Kurup K.,*
    Executive Coordinator, SEU,Coordinating office, Trivandrum - 695 033.
12. Mr. B.F.H.R. Bijli,*
    Deputy Chief Engineer (Monitoring), KWA, Trivandum - 695 033.
13. Dr. Bapiraju Sarma M.V. *
    Consulant Rural Health, Rajiv Gandhi Technology Mission, Hyderabad.
14. Prof.P.K. Bhattacharya
    Consultant, LCS, Rajiv Gandhi National Drinking Water
    Mission, GOI, New Delhi.
15. Ms.Biji Joseph,Research scholar,
    Dept. of Sociology, Karyavattom University,Trivandrum.
16. Mr. Chandrasekharan M.
    Field Investigator I.R.S & WSP, Danida, Cuddalore, Tamil Nadu.
17. Mrs. Chandrika Kumari Devi.P. *
    Executive Engineer, KWA, Arunodayam, TC 3/1142, S.R.Nagar, Trivandrum 04
18. Mrs. Chellammal S. *
    Associate Professor, College of Agriculture, Vellayani, Trivandrum - 695 522.
19. Mr. Dipak Sompura
    Shital Sanitary Sales, 13 Swastik Char Rasta, Navrangpura, Ahmedabad
20. Ms. Elizabeth Zachariah*
    Shalome, PHED Road, Kozhikode 673 009

21. Smt. Fancy Prema D.
    Joint Director, State Planning Board, Trivandrum.
22. Mr. Francis K.A,
    Field organiser, SEU, Kollam - 695 001.
23. Mr.Gopalakrishnan Nair*
    Senior Scientific Officer, Dept. of Science , Technology & Environment,
    General Hospital Road,Trivandrum - 695 037.
24. Mr. T.A.Georgekutty *
    President, Pazhakulam Social Service Society, Adoor, Pathanamthitta - 691 527.
25. Mrs. Geetha Nair,
    Women Co-ordinator, Daleview, Trivandrum.
26. Mrs. Geetha Nambiar,
    Secretary, SEU Trivandrum - 695 033.
27. Mr. George Varghese,*
    Programme officer, SEU (South), Kollam.
28. Ms. Geetha P.,
    Field organiser, SEU, Thrissur - 680 020.
29. Dr. Harichandran C.
    Chief, Social Service Section, Planning Board, Trivandrum.
30. Mr. Harish Kumar P.,
    Programme Officer, SEU, Trivandrum - 695 033.
31. Mr. Isac John,*
    Programme Officer, SEU (North) Kozhikode - 673 009.
32. Mr. Jayakumar P.,*
    Accountant, SEU Trivandrum - 695 033.
33. Mr. Jayasankara Prasad,
    Field Organiser, SEU, Kollam - 691 001.
34. Ms. Jessy Jacob,
    Field Organiser, SEU, Kollam - 691 001.
35. Mr. Jayakrishnan,
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36. Ms. Jayisy Joseph
    Programme Co-ordinator, Peermade Development Society, Peermade, Idukki.
37. Ms. Jessy Peter
    Programme Co-ordinator, Peermade Development Society, Peermade, Idukki.
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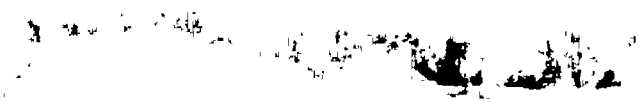

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