

## CHAPTER 9

# ENVIRONMENTAL MANAGEMENT

### 9.0.1 Summary

The earth is governed by some activities which cause pollution to the environment. Although some emissions occur naturally, most emissions released in the atmosphere are undesirable products of human civilization. Many of the world's poorest people still rely on biomass and charcoal burning for household energy needs and live in unhygienic conditions. Use of these fuels leads to higher levels of indoor air pollution than the acceptable ambient air quality standards. This poses a major public health hazard, including the risk of Acute Respiratory Infections (ARI), pneumonia, chronic respiratory disease and lung cancer, and is estimated to account for a substantial proportion of the global burden of disease. In Kenya, there is a dilemma on how to create a climate that is conducive to value-adding pursuits without upsetting the delicate ecological balance, hence endangering health and well-being of the people. This chapter therefore has addressed environmental management issues.

### 9.0.2 Methodology

Studies mainly used the descriptive survey design for data collection. Data was collected using in-depth interviews of key informants using questionnaires. FGDs were also used to add insight to opinions, while participant or systematic observation checklists or schedules were also used. Secondary data sources such as the review of documented information were also used.

Data was analysed using statistical tools such as the Statistical Package for Social Sciences (SPSS). Methods of data analysis used included: multiple stepwise linear regression, cross-tabulations and presented through graphical techniques. The Likert scale was used to measure people's attitudes while the Singh scale was used

for the development of a People's Participatory Index (PPI).

## 9.1 ENVIRONMENTAL POLLUTION

### 9.1.1 Summary

Indigenous people throughout the world occupying different agro-ecological zones have generated vast bodies of knowledge related to the management of their environment. A large portion of the population still relies mainly on traditional medical practitioners and local medicinal plants to satisfy their primary health care needs. Traditional medicine, based on plants, was originally the only healing systems known to humans and has not entirely disappeared. The wealth accumulated on traditional medicine has also been put into use in the area of environmental health.

### 9.1.2 Issues

- Failure to fully integrate population and environmental concerns in development planning at all levels.
- Lack of space for waste disposal in urban areas.
- Recycling of solid waste.

### 9.1.3 Findings

Scholars have marvelled at the rate at which environmental degradation is eroding the country's beauty. Some studies have examined the direct health impacts from household energy use among the poor people, which include burns and injuries. Wide ranges of interventions are used to reduce the impact of indoor air pollution. These include changes on the source (improved stoves, cleaner fuels), living environment (better ventilation) and user behaviour (keeping children away from smoke during peak cooking times).

The environmental changes communicated through policies at national level and local level. Experience to date shows that successful implementation requires participation by local people (particularly women), collaboration between ‘sectors’ with responsibility for health, energy, environment, housing and planning, with an emphasis on market sustainability.

Studies have revealed that poverty is both a cause and effect of environmental degradation. Population growth places undue pressure on the environmental resources. Kenya is at a high risk due to the haphazard rainfall, drought, desertification and soil erosion.

### 9.1.3 Recommendations

- There is need to remove the barriers to accelerated adoption and use of improved biomass technologies and promotion of sustainable charcoal production and use. If possible, there should be fuel substitution.
- The problems call for the need to use the 3R philosophy: to address waste prevention at the source, recovery of raw materials from the waste and putting discarded materials into new use recycle, reuse and reduce garbage to reduce pollution and to conserve the rapidly diminishing natural resource base.
- Many researchers have recommended that there should be consideration of the linkage between the prevailing environmental conditions and population growth.

### 9.1.4 Research Gaps

- Interest in studies related to the environment has just been rekindled, but the area is gaining ground. However, there still exist some information gaps and needs especially on pollution and conservation.
- Little documentation has also been done on the relationship between population and environment.

- Failure to fully integrate population and environmental concerns.

### 9.1.5 Research Agenda

- Relationship between environmental conservation and development.
- Relationship between population and environment.
- Assess implementation of the Environmental Management and Co-ordination Act (EMCA), of 1999.
- Research on environmental health to enhance disease prevention in the country.
- There is need for researches to address gender-energy concerns and fuel substitution.
- Challenges of attaining a clean and healthy environment.
- The impact of reduced forest cover on population and development.
- Assess the impact of reduced forest cover on population and development.

## 9.2 ENVIRONMENTAL SANITATION AND HYGIENE

### 9.2.1 Summary

Some studies examined the use of indigenous knowledge on medicinal plants in environmental education. They also tried to find out the social economic characteristics of the street food vendors and consumers on the street.

### 9.2.2 Issues

- Street food vending.
- Garbage and waste handling.
- Role of public health officers in safeguarding consumer interests.
- Use of sewage effluent.

### 9.2.3 Findings

The findings from the studies indicate that vendors had no prior training on food preparation skills. The surfaces used for the preparation of food were not cleaned regularly. Cooked foods

were stored at ambient temperature in cupboards, plastic containers and most was stored uncovered. Vendors washed utensils in buckets and the water was re-used several times before replacement. Eighty-five per cent of the vendors had garbage and waste beside the food stalls. Most vendors had no aprons, they handled food with bare hands and their heads were not covered. Sixty per cent of the consumers expressed concern over the hygiene and sanitation conditions of street foods but ate from them since they found them cheap. Public health officers found it hard to inspect the street food kiosks and vendors because there is no code of practice for street foods.

Other studies were on use of unboiled water. Up to 90% of those who drank unboiled water drawn from sources with sewage and 81% of those who ate vegetables grown from sources with sewage effluent 72% who used water for domestic purposes from sources with sewage effluent complained of having suffered infections associated with faecal contamination with a recur period of six months. A significant association was found from those who ate vegetables grown using sewage effluent, drank unboiled water containing sewage effluent and infections associated with faecal contamination. All effluent samples were in contravention of established WHO standards. Ministries of water, health and local government strongly reported that the effluent was posing a health risk to the community.

#### 9.2.4 Recommendations

- The problem of environmental sanitation needs to be tackled by combined efforts of both the residents and the government to avoid any possible outbreak of environmentally related diseases. The government should facilitate the development and implementation of a sound environmental health policy framework that will help reduce environmental risks.
- Allotment of street food centres by the municipal councils with adequate utility

services and garbage receptors, training and proper licensing of street food vendors and the empowerment of the Public Health Act should be upheld.

- The Local Government Ministry and the City Councils should provide street food centers with adequate facilities and utility services. Such centres will provide an environment for storing, preparing and serving safe food, provide the necessary utilities such as potable water, adequate electricity, drainage and solid waste disposal, provide conducive environment for consumers to be served safe food and provide good settings for the relevant authorities to conduct information education and training programmes for vendors and consumers.
- The code of practice for street food based on risk analysis, should be developed by the MOH to provide consumer protection.
- Consumers should be informed through posters, media and publicity campaigns about hazards associated with street food vendors to minimize those hazards.
- Training in basic food hygiene should be done before licensing of the food vendors to ensure rules of proper hygiene and sanitation are followed.
- Awareness creation for the community to reduce infections associated with faecal contamination through IEC on boiling drinking water, avoiding consumption of raw vegetables and intensification of personal hygiene.
- Quality of water should also be monitored routinely through regular sampling.

#### 9.2.5 Research Gaps

- Lack of data on the prevalence of the use of effluent water.

### 9.2.6 Research Agenda

- Similar in-depth study of a longer period preferably during rainy season when sewage overflows, compared with results from dry periods.
- Comparative studies in other areas, which have no sewerage system, need to be done to establish disease prevalence in such areas.

## 9.3 ENVIRONMENTAL EDUCATION

### 9.3.1 Summary

Some of the past studies undertaken in this area examined the use of indigenous knowledge on medicinal plants in environmental education. Other studies discussed the “relevance” of EHE in learning institutions, the approaches and methods used to disseminate health education (HE) information in schools and the challenges facing the implementation of HE in Kenya. The basis, relevance and practice of environmental HE in Urban Environmental Planning and Management (UEPM) with the idea of identifying need for it, extent of its application and challenges was also of interest to some researchers.

There were some studies that identified the financing levels of options for training of Occupational Health and Safety Professionals and Personnel (OHSP) in Kenya.

Others attempted to determine the current status of local training opportunities in the fields of OHS, explored the policy framework in education and training in the critical scientific area of OHS and financing options for OHSP in Kenya.

### 9.3.2 Issues

- Curriculum development of EE.
- Training in EE.
- Demand for EE.

### 9.3.3 Findings

People’s perception and attitudes towards environmental rehabilitation activities with special emphasis on the sand dunes stabilization was also assessed in a few studies.

A large portion of the population in different parts of Kenya still rely mainly on traditional medical practitioners and local medicinal plants to satisfy their primary healthcare needs. Traditional medicine, based on plants, originally the only healing system known to humans has never entirely disappeared. The wealth accumulated on traditional medicine has also been put into use in the area of environmental health.

EHE offered in learning institutions is intended to serve a dual purpose: to generate and impart new knowledge on how to respond to environmental health problems, and to promote good health through enhancement of appropriate use of natural and human resource.

However, the system in learning institutions must offer relevant content for learners and health scholars, researchers, professionals, and community members.

There has been little focus on Occupational Health and Safety (OHS), resulting in high incidences of preventable occupational injuries associated with high costs of doing business. Increased investment in the training of OHS professionals and personnel (OHSP’s) at all levels ranging from primary schools through to universities will provide the most desirable proactive measure to prevent occupational injuries and associated costs in future.

The demand for HE in Kenya has increased due to the vast improvement in the knowledge of methods of prevention and control of diseases. HE has emerged and schools have been considered as excellent places to carry it out.

This because among all organized institutions, it is in the school where the largest mass of people, who present the broadest and deepest channel of informing the citizens, passes.

EHE allows for compatible land uses to be planned for and managed so that the environmental and human health are not compromised.

The basis for EHE is to assist urban environmental planners and managers to prevent deterioration of sanitary conditions, enhance amenity and safety of human settlements, and protect environmental resources from degradation.

Some studies have also established the relevance of EHE in UEPM; communities' and professionals' understanding and conception of EHE; adequacy and adaptability; existence of machinery for enforcement; communities' conception and attitudes; and the ability of the communities to apply knowledge and skills acquired from EHE to enhance UEPM.

Studies also established challenges facing EHE such as unclear conceptualization of the issues; lack of well-articulated EHE curriculum; unsuitable teaching materials; weak human and technical capacities; loose networking and coordination of EHE.

The methods used to teach health education in Kenya lack an interactive approach and are basically theoretical, with minimal practical experiences. Health education promotion has also been hampered by lack of learning materials and facilities, insufficient integration into the school curriculum, and lack of policies that place a high priority on health.

Their significant factors influencing participation in environmental rehabilitation included level of literacy, membership of environmental groups, training and perception of the EMC.

### 9.3.4 Recommendations

- Successful implementation of the proposed curricular will largely depend on relevance of its content, its design and the targeted learners. This may be enhanced through proper choice of teaching materials.
- The need to offer EHE programmes is urgent. However, the relevance of its content must be regularly appraised particularly due to the diversity, dynamism of the environment, changing technologies and varying socio-cultural values. The quality and relevance of the selected contents are affected by these interacting factors. The studies recommend that learners acquire new knowledge, skills, attitudes and values. Relevant content on health and environment is offered to enhance the attainment of the intended goals.
- Learners should access intensive induction and continuous tailor-made training programmes, designed by professional curriculum developers, to new and potential workers in the labour market.
- It is proposed that the costs for employees and expert training be met from increased budgetary allocations, Training Levy, WHO (Collaborating Centres), ILO (CIS Centres), Occupational health and safety fund and be co-funded by industry. All sectors of economy must embrace OHS for economic growth to pick up and for jobs to be created.
- Increased investment in the training of OHS personnel at all levels ranging from primary schools through universities should be government's objective.
- Adequate resources should be allocated for staff training and development at the OHS as the most desirable proactive measure to prevent occupational injuries and associated costs. The costs should be met from all stakeholders.

- There is need to motivate and update teachers on HE issues and for greater integration of the same into the regular curriculum instead of HE being seen to be in conflict with time-tabling requirements of other subjects. MOEST in collaboration with other stakeholders should help in the development of teaching and learning materials. Further, the child-to-child (C-T-C) approach should be used and children involved in the preparation of materials and carrying out demonstrations in schools, in addition to promoting HE messages through song, play and poetry.
- There is need for collaboration among health and educational officials, teachers, students, parents and community leaders in fostering EHE through improvement of school environment, policies and practices. Curriculum developers should involve all education stakeholders when developing the curriculum.
- Community participation in EHE is encouraged especially for community around the schools and parents should help to foster HE by ensuring that what students learn in the classroom is translated into health practices both at home and in the school.
- There should also be clear and detailed programmes and work plans set by school management to overcome skepticism on EHE by other school staff and teachers.
- The quality of EHE content has fallen below expectations especially with respect to precision, timeliness, practicability and relevance to the contemporary society.
- There is need to resolve conceptual problems so that different stakeholders can understand EHE uniformly; enhance the quality of teaching resources to make them more

effective, especially those that promote UEPM and develop and articulate EHE curricula, especially to address specific aspects of UEPM. The teaching approaches should also be improved, especially to make them trainee-centred, practical and action-oriented. Human and technical capacities should also be enhanced to make EHE more vibrant and, to impart positive values, perceptions and attitudes to the trainees useful for sustainable UEPM.

### 9.3.5 Research Gaps

- Improvement of current research procedures, increase of awareness campaigns to overcome stereotype ideas among the community, development of relevant EHE teaching materials, adequate selection of appropriate mode of information dissemination, and retraining of personnel handling the content.
- There is limited research and lowly developed extension and outreach programmes in EHE.
- The symbiotic relationship between health and environment is not adequately addressed in UEPM.

### 9.3.6 Research Agenda

- Assess measures instituted for disaster preparedness based on assessment of vulnerabilities and risks.
- Assess adequacy of assistance provided to vulnerable groups during disasters.
- Ascertain the relationship between regional environmental factors, mortality and fertility and effects of environmental conditions, especially in the rural areas, on desired family size

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