STATUS OF ENVIRONMENTAL HEALTH EDUCATION
IN THE EASTERN AFRICA REGION:
OPPORTUNITIES, CHALLENGES
AND THE WAY FORWARD

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Abstract

Fresh water is a finite resource, essential for agriculture, industry and for human existence. Without fresh water of adequate quantity and quality, sustainable development is not possible. Water pollution and wasteful use of fresh water threatens socio-economic development and make costly water treatment essential to satisfy increasing needs for drinking water. Human impacts on the environment have increased dramatically during the past decades and they continue to grow in natural ecosystems, freshwater and marine environments and the atmosphere. Socio-economic development – including urbanization, industrial production, agricultural activities and their associated pollution – has reached a level where water quality becomes a limiting factor for further development in many river basins.

There is now a fundamental need for scientific assessment of water quality on a world-wide basis. Such assessments must raise awareness of the magnitude of the problems and emphasize the urgent need for action, in addition to establishing a rational basis for water pollution control. Water can affect health in a number of different ways. Lack of water for personal hygiene may result in the increased transmission of some diseases, called water-washed diseases. On the other hand, water may carry the specific diseases, called water-borne diseases. Or it may be necessary in the life cycle of a disease vector – such diseases are called water-related diseases. This paper therefore examines key issues related to water quality and how they relate to Environmental Health Education.

Introduction

Fresh water is a finite resource, essential; for agriculture, industry and for human existence itself. Without fresh water of adequate quantity and quality, sustainable development is not possible. Water pollution and wasteful use of fresh water threatens socio-economic development and make costly water treatment essential to satisfy increasing needs for drinking water (Abwao, 2003). Human impacts on the environment have increased dramatically and they continue to grow in natural ecosystems, fresh water and marine environments and the atmosphere. Socio-economic development has reached a level where water quality becomes a limiting factor for further development in many river basins. Most large-scale human activities affect our water supplies, often leaving people with substandard drinking water. This is especially true in developing countries, where water is rarely treated before consumption, exposing many to the risk of water-borne infection and causing scandalously high rates of infant mortality.

Ground water for instance is contaminated with nitrates from chemically supported agriculture; many lakes and reservoirs are becoming increasingly eutrophied and their ability to support aquatic life is being threatened; rivers carry toxic loads of heavy metals and industrial or domestic waste downstream to towns and, eventually, the sea; and land is going out of production at a frightening rate, poisoned by salt that has been concentrated by inefficient irrigation. As early as the United Nations (UN) Conference on Human Environment in Stockholm in 1972, and later at the UN Water Conference in Mar del Plata in 1977, the member states of the UN system recommended a variety of measures geared towards curbing water quality deterioration. Proposals for action ranged from control of disease vectors associated with irrigation and restrictions in the use of agrochemicals, to the monitoring and control of sewage and industrial effluents.

Ironically, the years of the United Nations International Drinking Water Supply and Sanitation Decade (IDWSSD or "The Water Decade", running from 1981 until 1990) were marked by a general deterioration in quality of vital water resources, particularly those of developing countries. Although reversing the damage done will itself be complicated and expensive, it is important indeed essential - to minimize further harm. One way of achieving this is by publicizing the issues. It is important to inform, in plain language, those who need to know. Making more people more aware of what is happening to their water supplies may be one of the most effective ways of slowing down water pollution.

Water Uses and Water Quality

Water quality is, defined by a range of variables, which limit water use; many uses have some common requirements for certain quality variables but each use will have its own demands and its own influences on water quality [WHO/UNEP, 1991]. Quality and quantity demands of different users will not always be compatible and the activities of one user may restrict the activities of another, either by demanding water of a quality outside the range required by the other user or by lowering quality in the course of using the water.

Efforts to improve or maintain a certain water quality often aim at a compromise between the quality and quantity demands of different users. There is an
increasing recognition that natural ecosystems have a legitimate place in the consideration of options for water quality management. This is both for their intrinsic value and because ecosystems are sensitive indicators of changes or deterioration in overall water quality, providing a useful addition to physical and chemical information [UNDP, 1990].

Different levels of water purity are required for different types of water use. There are five basic categories of water use: Public water supply, mainly destined for human consumption; water used in agriculture; in industry; for recreation; and for fisheries and wildlife. Each category of use has its own quality criteria and methods for assessing suitability. The highest standards of purity are required for drinking water, while, on the other hand, it is acceptable for water used for industrial cooling to be relatively highly polluted (UNEP, 1991).

The Acceleration of Water Pollution
Since the industrial revolution, water pollution problems have become first regional, then continental, and now global. Urbanization is one of the major factors associated with the accelerating pace of freshwater pollution. Urbanization and the consequent increase in population, intensification of agriculture and growth in industries may result in increased freshwater pollution - particularly when coupled with inadequate sewage collection, and treatment. Organic material, bacteria and nutrients from municipal sewage outlets, factory effluent outlets and stormwater run-off into open drains can overload water supplies. Oxygen levels are reduced as these contaminants are broken down, contributing to eutrophication. Bacterial contamination is particularly severe in water-scarce developing countries, where sewage treatment is often inadequate or non-existent. Infants and children particularly lack resistance to such contamination and many die from drinking polluted water. A good example is Nairobi River which flows through the city of Nairobi and Nairobi dam on the outskirts of Nairobi city.

Deforestation to clear land for agriculture and urban growth often leads to water contamination. When soil is stripped of its protective vegetative covering, it becomes prone to soil erosion. This, in turn, leads to higher water turbidity as a result of increased amounts of suspended matter, nutrient leaching and the decreased water-retention capacity of the soil. Good examples of this scenario include the most important water towers in Kenya such as Aberdare forest, Mau forest, Nandi forest and Mount Elgon forest.

Damming rivers to form reservoirs can alter water quality by increasing residence time and evaporation, and by decreasing levels of suspended matter (due to settling). Fewer nutrients are carried downstream and fisheries often suffer. This is exemplified within the series of dams on the Tana River in Kenya namely Masinga, Kiambere, Kamburu and Gitaru.

Destruction of wetlands, besides destroying the habitat of many birds and fish, removes natural filters capable of storing and degrading many pollutants, such as phosphorus and heavy metals. A classical case is that of the Tana Delta and Yala Swamps in Kenya.

Mining and industrial development doubled globally between 1965 and 1984, generating much potentially toxic waste, including harmful synthetic organic material [UNEP, 1991]. Some of these wastes, through leaching of mine tailings, direct effluent, atmospheric transport or other means, make its way into water supplies. The volume of most industrial waste is on the increase, with faster rates of increase in developing countries. It is difficult to monitor industrial pollutants because they are varied and often highly diluted. In Kenya, this is quite evident, good examples include: Pan African Paper Mils vs Nzoia River, Kenya Breweries vs. Ruaraka River and Kamiti Tanneries vs Kamiti River.

Agricultural production increased globally by 19 per cent between 1975 and 1984, and doubled in many developing countries over the same period (WHO/UNEP, 1989). Annual fertilizer use varied from less than 1kg/ha in parts of Africa to more than 700kg/ha in the Netherlands, contributing worrying amounts of nitrates (and phosphates) to water supplies [UNDP, 1990]. Though the developed world has the highest levels of fertilizer use at present, developing countries are catching up and at the same time, pesticides use has increased much more than fertilizer use (UNEP, 1989). Over irrigation can aggravate the situation by pushing water, with its chemical pollutants, below root level and closer to groundwater.

Primary energy consumption almost doubled between 1965 and 1984, resulting in greatly increased atmospheric emissions of sulphur and nitrogen oxides, the main cause of acid rain [WHO/UNEP, 1989]. Acidification of freshwater, particularly lakes, is a major concern. More important for human health, this process has led to higher levels of metal in water supplies and food chains as trace elements are leached from soil and pipes by acid water.

Accidental water pollution can arise from many sources (such as burst oil pipes and tanks, major leaks, fires and oil spills) and can cause varying degrees of damages depending on the quantity, toxicity and
persistence of the pollutant, and the size and resilience of the water body. Industrial accidents involving spillage of long-lasting pollutants such as radioactive materials, heavy metals and persistent organic substances have the most serious effects on water quality.

Water, the Environment and Health
Water is essential to life. It is a part of every cell and is necessary for most basic functions like respiration and digestion. Water is also a good solvent and many substances, some useful and some harmful to life, may be dissolved in it. Water can affect health in a number of ways. Lack of water for personal hygiene may result in the increased transmission of some diseases, called water-washed diseases. Water may carry the organisms of specific diseases, called water-borne diseases. Or it may be necessary in the life cycle of a disease vector-such are called water-related diseases. The important diseases affected by water in these ways are: water-washed diseases, for instance, diarrhoea and dysentery, skin diseases (including scabies), eye diseases (including trachoma); Water-borne diseases, for instance typhoid, cholera, poliomyelitis, amoebiasis, hepatitis A and water-related diseases, for instance, malaria, schistosomiasis and onchocerciasis.

In preventing the increase in water-washed diseases, the quantity of water is important. To prevent water-borne diseases, it is necessary to improve the quality of water. As the water-washed diseases are generally more common than the water-borne diseases, we can do a lot to improve health if we can make more water easily available (Wood C.H, et al 1987). Of course, the cleaner and purer the water the better, but we should not delay increasing the quantity of water just because we cannot obtain the best quality.

Health Education
The aim of health education is to secure beneficial health promoting changes in people's behaviour. Time spent in helping people to understand and in advising them, is not wasted. If you help and persuade a patient, he or she may spread your message in a way you could never spread it yourself. Health education is like planting seeds. To succeed in health education know the people who need your advice; know their thinking, their beliefs, their customs and daily habits, the way they live and what they can, and also what they cannot do. To change people's behaviour, understand the roots of that behaviour. Though your personal efforts in the health education of patients may lead only to slow progress, the success of the team will lead to more rapid and widespread progress.

Steps to Change Behaviour
To secure behaviour change in a community and a "breakthrough" in a particular community health problem - like scabies, or diarrhoeas, or malaria - a programme must be planned. One way to do this is to follow the "five-step method"

Step 1: Describe the behaviour problem.
What is it that people do, or do not do, that we want to change? Do we want them to wash more often, use only safe water ..... and so on?

Step 2: Analyse the behaviour problem - diagnosis
Why do they do, or not do, that? What is it in their thinking, their beliefs, customs, or way of living, that leads to this behaviour? Is their water too far away, too cold? Do they need bath houses? etc.

Step 3: Plan the programme - educational prescription
Draw up the messages to be discussed with mothers, fathers, school teachers, Ten-cell leaders, etc., on the need for repairing wells, protecting streams, getting a borehole, building bath houses, etc.

Step 4: Organize the programme - education treatment.
Ensure that staff know exactly what they have to do through meetings and training. Visit people and talk about good wells, easily constructed bath houses, etc. Assist in community meetings, talk with patients, etc.

Step 5: Assessing programme success - measuring response
Do this by counting the results obtained, e.g. the number of wells improved, boreholes working, people not now using unsafe water, bath houses built, etc., at a preselected time after the programme started. Success in health education is measured by changes in behaviour. The following are some key areas in which an individual can take action to conserve water and to keep current water supplies free of contamination:-Filter water; boil your water; Conserve Energy; be careful what you throw away; try to use a clean detergent; use water efficiently; spread the word; and report any incidence of water contamination to relevant authorities.

References

UNEP (1991), Fresh Water Pollution. UNEP/GEMS Environment Library No. 6. UNEP, Nairobi.

