Start with the children

It is often difficult to 'teach old dogs new tricks' so why not start with the children. Introducing simple water quality test kits in Junior Secondary Schools in the city of Kumasi in Ghana has not only helped young people to become more environmentally aware and appreciate the important links between water quality and community health but it has also helped to disseminate this information to the older generations.

IN KUMASI

Community health and environmental degradation around the fringes of major cities – the peri-urban areas – can become a major issue as their populations expand rapidly and infrastructure is unable to keep up with the pace of development. The peri-urban areas around Kumasi are particularly vulnerable as more agricultural land is turned into housing. The city lies across a major drainage divide and so water draining from the surrounding rural areas flows through the suburbs into the city and then out again into the countryside. This brings with it a range of water quality problems that affect not only the city but also the peri-urban areas where the population is usually less well equipped to deal with them.

A research programme focusing on Kumasi has been examining ways of making communities more aware of the environmental problems they face and equally important what they can do to solve them. It was decided that a good place to start was in the local junior schools.

THE PROBLEM

Transforming agricultural and forested land into housing and roads can have a dramatic impact on local hydrology. The natural landscape, which tends to absorb rainfall, becomes more impervious and this increases the intensity and volume of rainwater runoff into streams. Urban industrial growth just adds to the problem as more diverse solid and liquid wastes find their way into the water and increases the pollution. Unfortunately stream water is also the principal source of domestic water supply for many peri-urban communities, especially the poorer ones who cannot afford to buy clean water or construct and maintain boreholes. The consequences for community health under these circumstances can be disastrous.

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An alternative source of domestic water supply is groundwater but this needs regular recharging. At first sight this might not seem to be a problem in Kumasi where the long term

average annual rainfall is over 1500 mm. But a closer look at more recent records shows that not only is rainfall declining but the number of rainfall days has also fallen in the past 10 years. So reductions in rainfall and increases in runoff have meant that water that used to infiltrate and replenish the groundwater is no longer available for this purpose. Add to this the significant population growth over the same period of between 0.25 to 1.0 million people and the fact that most live beyond the range of the Ghana Water Company's piped supply, means that the case for protecting the stream flows and groundwater resources is now overwhelming.

TACKLING THE PROBLEM

When the local people were asked how they perceived the problem and its solution the answer was that the water supplies were inadequate and more boreholes were needed. The water quality issue as well as the effects of increasing groundwater abstraction on the sustainability of the supply were not well understood.

In order to improve this situation more information was needed not just on the extent of pollution but also on how communities use water, how they perceive water resources and how they go about making decisions that affect their environment and water resources in particular. Eight communities in two sub-catchments were selected for more detailed investigations.

Two years of recording water quality in selected streams provided a grim picture of pollution. Both organic and inorganic pollutants increased as water moved downstream through the city.

Although there was evidence of some dilution effects resulting from urban runoff during intense rainstorms, not only was the river water clearly (and visually) polluted downstream of the city, there were also significant levels of pollutants in a hand-dug well indicating that local shallow groundwater was also becoming contaminated. At a village downstream of the city a preliminary investigation showed that water used for drinking contained heavy metals in excess of safe drinking water standards and that there was a build up of heavy metals in fish tissue and in floodplain sediments.

Surveys of gender roles and users' attitudes showed that women were mainly responsible for domestic water collection yet they were not usually involved in village decisions affecting water quality such as the siting of pit latrines or waste dumps. People were generally aware of the growing pollution in the streams and its link to health problems. They could also see that children were suffering most because they tended to be more careless with hygiene.

Inadequate potable water, inadequate toilets and sanitation, poorly-sited or poorly-maintained refuse dumps, soil erosion, sand-winning pits, encroachment on water courses, and institutional weaknesses were among the main problems that people identified. But ignorance about the relationships between health, inappropriate land-use practices and water contamination was widespread. There was little or no perception that many of these problems were linked to each other or that actions taken in one part of the catchment could have repercussions elsewhere. Putting in more boreholes was seen as the main target.

GETTING THE MESSAGE ACROSS

A key message to get across to the communities was that simply putting in more boreholes was not only expensive but also not necessarily the best long-term solution to their problems. In any case few communities around Kumasi have the resources to put in new boreholes and some struggle to maintain those already installed. What made more sense was to protect and make better use of existing water resources emphasising management of the whole catchment rather than individual locations within it.

The best vehicle for this message was thought to be the local Junior Secondary Schools. Simple water quality test kits were introduced into schools located close to the project water quality sampling points. In this way the schools' test results could be monitored and their measuring techniques refined. Resulting from this was a growing awareness among school children about environmental issues and in particular the effects of water quality on community health. There was evidence too that schools were spreading this knowledge to the wider community through presentations to their villages committees.

Other means of dissemination were also developed such as cartoon style leaflets for distributing among communities and explanatory diagrams/illustrations for use at small group meetings. Practical demonstrations of water harvesting, soil erosion control and the use of protective vegetation were also constructed and evaluated in target communities.

Surveys are now underway to find out just how well this new knowledge and the dissemination process has been instrumental in raising awareness among communities and how this has changed attitudes towards the protection and better use of water resources.

GOOD PRACTICE

All stakeholders, including polluters, are now being encouraged to get actively involved in developing a manual of 'good practice' - Watershed Management Framework. This is designed to help village committees make more informed decisions about land and water use. A prototype is being tested and includes rules for:

- Catchment surface protection
- Water resource protection
- Land use criteria
- Land allocation procedures
- Environmental self-monitoring
- Roles and responsibilities of the full range of stakeholders
- Consultation protocols for reporting environmental problems
- Identification of sources of funding for environmental micro-projects.

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