Case study: Investigative monitoring

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Short summary

Investigative monitoring is needed to understand what important contaminants might be present in a water supply or proposed water supply prior to improvement. For microbiological contaminants investigative monitoring or sampling is a very useful first step in characterizing the quality of a source but continued monitoring is also important for assessing changes in that source over time and for determining whether contamination is occurring after collection of the water and the need for household treatment. In some cases other analysis is appropriate. Chemical analysis requires more sophisticated equipment and techniques. Investment in the development of new tools and diagnostic approaches would be a huge benefit for relatively little outlay. The MDGs included microbial indicators and also arsenic and fluoride yet monitoring approaches for application with the SDGs has not been fully developed and are needed.

Key words:

Reducing pollution ; Eliminating dumping of hazardouse waste ; Minimising release of hazardous chemicals and materials - achieve sound management of chemicals through their life cycle ; Reducing untreated wastewater ; Increasing recycling and safe reuse ; Protect, restore and sustainable use of inland freshwater related ecosystems ; Prevent the introduction and significantly reduce the impact of alien species ; Reduce number of deaths and number of affected people ; Reduce economic losses ; Protection of the poor and vulnerable

Issues addressed:

Water quality (pollution, dumping of toxic materials, wastewater management, recycling, reuse, restore ecosystems and aquifers)

New Monitoring approaches to ensure water quality. For surface sources it is reasonable to assume that there will be the potential for faecal contamination but

determining whether improvements can deliver the required quality to get the greatest return from the investment requires some information. For groundwater sources knowing whether the source is susceptible to contamination is also important. For chemical contaminants only analysis and investigative monitoring can tell us what the case is. The arsenic problem in Bangladesh is an example of where a relatively small investment would have delivered significant savings on the further investment required to deliver safe water. This is also true with several areas where fluoride is naturally present and there are other contaminants that are now causing concern because they are present at unusual concentrations in groundwater, such as manganese and in some wells, nitrate.

Risks (mortality, economic losses caused by natural and human-induced disasters)

Illnesses, chronic conditions

Tools for implementation:

Financing / economic instruments: Capacity building requires investment in training and equipment. As a minimum there is a need for at least one central laboratory in a country that provides the basis for ensuring that the quality of microbial and chemical analysis is adequate. Turbidity measurement in the field requires the development of a robust and easy to use system that is cheap and is capable of reliably measuring at least to 1 NTU. Finally chlorine residual measurements are good surrogate measurements for safe water.

Lessons Learned:

Triggers: Modest investment used properly can save a considerable amount of additional and unanticipated cost at a later stage. This investment also helps to underpin drinking water quality standards which provide the underpinning for the WHO Water Safety Plan approach.

Drivers: Government and private laboratories. Government and University partnerships can be established to address laboratory capacity.

Barriers: Prevention is usually the most cost effective means of delivering the requirement for safe water and to do this we require knowledge of the hazards. However, for many countries the capacity is inadequate and investment in the means for building capacity is essential if we are to move forward to delivering safe water with the post 2015 MDGs.

What has worked well?

What can be improved?

The way forward: A University curriculum around water quality diagnostics is needed. This should include risk assessment so that a clear understanding of the hazards and the need for investigative monitoring can be attained.

Links: