GGBP Case Study Series

Monitoring and Evaluation of Water Quality in Denmark

Related Chapter: Monitoring and evaluation

Case developed by: Ashley Allen

Country: Denmark

Sector(s): Water

Key words: Monitoring and evaluation, aquatic environment

In Denmark decades of monitoring of water quality has played a key role in driving policy improvement and the technologies needed to ensure clean water, translating into opportunities for green growth.

Context

In Denmark, green growth is a policy priority, and leaders describe the country as undergoing a "green transition" (Danish Energy Agency et al., 2012). Policies to reduce environmental pollution by investing in innovative green technologies are part of a broader strategy for economic growth (Danish Energy Agency et al., 2012). Since the 1980s steps have been taken to improve water quality and deal with pollution from agricultural, industrial, and municipal sources (Frederiksen and Larsen, 2013). The water sector also has significant potential for export growth to enable advanced water treatment and controls in other countries (Danish Water Forum, 2014).

Over the last few decades, Denmark has implemented three action plans on the aquatic environment – in the mid-1980s, in 2004, and in 2009. The most recent concentrates on stimulating green technologies as well as improving domestic water quality (Frederiksen and Larsen, 2013).

Approach

Monitoring and evaluation (M&E) systems have a well-established role in Denmark's policy system. Agricultural and water policies are linked with standardized European Union (EU) reporting obligations (Frederiksen and Larsen, 2013). In addition, Denmark developed national green business indicators in 2012. These statistics analyze the current and potential future value and proportion of the economy for green products and exports. This combination of environmental monitoring indicators and green business data can be useful to inform green growth policies and actions.

Denmark's national aquatic policy employed an M&E program to:

- Assess the current state of the aquatic environment and the pressures on groundwater and surface water, and determine the magnitude of pollutant inputs;
- Supplement the management of the aquatic environment undertaken by national environmental authorities pursuant to the Environmental Protection Act;
- Demonstrate the effect of regulations, investments, and other measures adopted in the aquatic policy;
- Help establish a scientific basis for policy decisions on additional measures to meet water quality objectives (Frederiksen and Larsen, 2013).

The program utilized indicators established at the EU level for standardized monitoring of integrating environmental issues in agricultural development. Key indicators related to the leaching of nitrogen into the aquatic environment, such as nitrogen surplus, nitrogen leaching from the root-zone, nitrogen use efficiency, and phosphorous surplus (Frederiksen and Larsen, 2013).

Driven by EU directives, and an inclusive policy-setting process involving multiple government ministries and a broad stakeholder forum, a high degree of consensus on the aquatic policy goals and metrics was reached. The aquatic policy process also established indicator data collection and dissemination processes and required yearly status reports on policy performance to ensure that evidence could be fed back into the policy process. These status reports and a series of performance evaluations by an independent academic institution were made publicly available.

Outcomes

With 20 years of monitoring data, Denmark is beginning to see a positive impact from the implementation of its aquatic action plans – data suggest that nitrate levels are decreasing on average and there is a general trend of increasing water table levels (Geological Survey of Denmark and Greenland, 2010). There have also been reduced emissions of nitrous oxide, a potent greenhouse gas (OECD, 2012).

There is evidence that the indicator data and evaluation findings are being used by the Ministry of the Environment and the Ministry of Food, Agriculture and Fisheries, and by Danish non-governmental organizations (NGOs) (Frederiksen and Larsen, 2013). In some cases M&E findings have led to direct results. Following one mid-term evaluation of the policy, the Ministry of the Environment changed a voluntary guideline for buffer zones between agricultural plots and water sources to a mandatory requirement (Hojer, 2014). Another example was the closing of a number of private wells after they tested high levels of nitrogen and pesticides (Hojer, 2014).

Findings have informed broader political debate and policy formation. For example, a government-backed analysis of the first phase of the national aquatic policy concluded that targets had been reached. A political debate ensued with NGOs analyzing the data and determining that targets had not been reached and that a new phase of the policy was needed. Ultimately, in the subsequent election cycle, a new government was elected that initiated a new phase of the policy, which responded to stakeholder demands (Frederiksen and Larsen, 2013).

Lessons

The case of the national aquatic policy in Denmark demonstrates some features of effective monitoring and evaluation, including:

- High level of consensus on goals and metrics, which sends a clear signal on the consequences when the targets are not met;
- Institutionalization of the monitoring process;
- High transparency and data availability in the process (for example, for the aquatic plan, data were provided through a website produced for the development of the action plan);
- Regular studies by a respected independent academic institution.

This case also suggests some potential challenges. For example, how to reconcile conflicting interests and indicator data use among stakeholders and better understand the implications of using the data for political purposes. Another challenge is to balance meeting the M&E demands of stakeholders with the diminishing returns of increasing investment in the monitoring system. In a transparent system, users may prefer more granular data, but collecting and providing such data may not be cost-efficient.

Further Information

Groundwater Monitoring:
http://www.geus.dk/publications/grundvandsovervaagning/grundvandsovervaagning-uk.htm

Danish Water Forum:
http://www.danishwaterforum.dk/activities/Water_and_Green_Growth.html

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