System of Environmental Indicators for Water Quality and Agriculture

The Driver, Pressure, State, Impact and Response (DPSIR) framework for agriculture and surface waters

-Markus Vinnari-

Every step in the DPSIR framework can be thought to represent an information layer. In each layer, the information seldom covers the complete field, but all important information should still be included.

Figure 3. Sources of phosphorus to Lake Pyhäjärvi of Säkylä

Indicators for every step of the framework were collected and relations were calculated.

The four main problems encountered with the framework were:
1. Lack of data.
2. Possible data sources are not clear.
3. Definition criteria for the different elements at operational level are not clear.
4. Difficulties of finding dependencies between variables because of, for example, the time lacks

A computer program was developed during the project to monitor the water quality changes.

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Figure 1. The DPSIR framework for reporting environmental issues and establishing causal relations

In Finland the main problem agriculture assess to surface waters is eutrophication.

Phosphorus and nitrogen losses from agricultural land exceed those of industrial and municipal loads summed together.

Tools are needed to estimate the effects of agriculture to surface waters. One possible tool are the indicator frameworks.

Indicator is a parameter or a value derived from parameters that describe the state of the environment and its impact on human beings, ecosystems and materials, the pressures on the environment, the driving forces and the responses steering that system.

The Driver, Pressure, State, Impact and Response (DPSIR) indicator framework points out the importance of causality effect in environmental issues. The DPSIR framework is developed, used and promoted by the European Environmental Agency.

DPSIR is an extension of the PSR model developed by OECD.

The area from which the data was collected in this research was the Lake Pyhäjärvi drainage area in southern Finland.

Figure 2. Research area

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Figure 1.

Figure 2.