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# Use of Indicators as Tools of Decision-Making

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*The philosophers have only interpreted the world, the point is however to change it.*  
Karl Marx

## 1. Introduction

The basis of this research was on the administrative process of Finnish Ministry of Agriculture and Forestry (MMM) to develop sustainability indicators. Indicators were aimed to be tools for monitoring the Strategy for Renewable Natural Resources (MMM 2001). Indicators were expected to provide reliable and timely information about the state of resources including the pressures and threats that will affect management of resources. However, creating of such an information system is quite a challenge. The task of this research project was to produce additional theoretical understanding on the functional role of indicators.

## 2. Methodological Settings

The research process was based on the theoretical framework expressed by Hugo Fjelsted Alroe and Erik Steen Kristensen (Alroe & Kristensen 2002). According to them the role of science should move from that of an independent science to science as a special learning process for society. The optimal situation for the creation of new knowledge would be the utilisation of both insiders and outsiders perspectives, which together facilitate the self-reflective cycle of learning. In this particularly study the insiders perspective was built up through the personal participation in the administrative process of developing the indicators. That provided the access to the values, worldviews and goals involved in the administrative system. The outside viewpoint was made up with the assistance of three different data basis. They were collected independently from the administrative process. Given the strong role of developer the outside stance of these studies is obviously not free of values. It is rather representing conditional independence. Eventually, the quality of the current findings will be conformed or disconfirmed along with the feed back from the administrative process. However this kind of information is not yet available for this presentation.

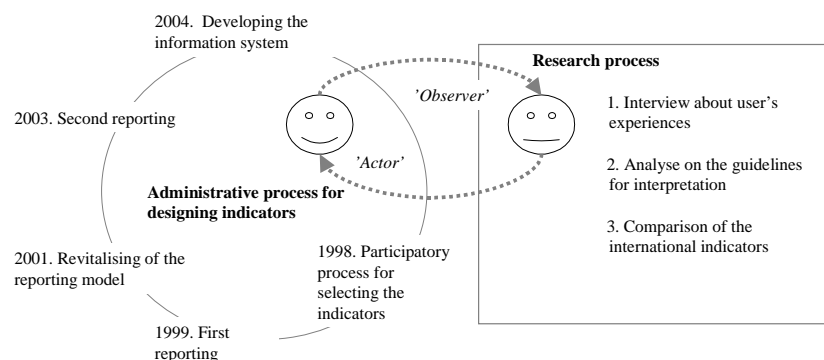


Figure 1. Methodological settings for the research

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### 3. Results

#### 3.1 User study

Thematic interview among the users revealed that the use of sustainability report (MMM 1999) has been, so far, quite modest. However, actors were interested in quantitative methods in order to address the issues of environmental management and sustainability, and they found the report as a promising start for these efforts. The reasons for the minimal use were studied further with the assistance of information theories. There was included the viewpoints of rationalist, cognitivist, constructionist and policy approach.

#### 3.2 Theoretical underpinnings for the interpretation

The guidelines for the interpretation were studied on the basis of the same report as user's experiences. In this report, information was mainly presented in the form of temporal trends. The other cases for making the interpretation were found to be qualitative descriptions, regional comparisons and settings to the performance targets. The trends provided present information about the overall direction of recent changes. They lack however the exact definition about current state in regard the policy goals. Future alternatives to develop the report model were considered on the basis of these findings. Adopting of the stricter target lines for the evaluation would eventually make the report managerially more effective tool, but simultaneously could result the narrowing scope for planning. The other possibility would be an adoptive mode of planning, where emphasis is to facilitate the communication, and discussion over the subject. In such context interpretation of data sets takes the form to gradually improving understanding. The key challenge of interpretation is to address the meaning of the hard facts in regard the overall policy issues.

#### 3.3 Comparison of international indicator sets

In third phase, the quality aspects of indicator's knowledge were highlighted by comparing the performance of international indicator sets from national point of view. Such a perspective is obviously restricted in terms of the overall evaluation of the indicator set, but is useful for reaching deeper insights on the quality of indicators' knowledge. The data for comparison was collected from the publications of OECD (OECD 2001) and Commission of the European Communities (CEC 1999). In the beginning, indicators were analyzed at thematic level. Some data sets with reasonably good data availability and scientific soundness were found to exist already. The main problem of indicators appears is in relating these results on the policy goals, which are dealing with much broader and more holistic issues than indicators. Moreover, the interpretation of these figures should be developed to address the varying natural and socio-economic circumstances of European agriculture. Further on, the systemic correlations between the prevailing data sets were examined. Some sort of integration in the environmental problems of agriculture was found between the countries. The relationships between the ecological and socio-economic indicators were however rare. This means, that current selections of socio-economic indicators are actually acting as general presentation to agricultural sector rather than any particular driving forces for environmental change. The findings are however preliminary due to the limited nature of data materials. More important is that the study raises a question whether indicators are appropriate tools for examining the performance of agricultural systems. Deeper understanding will be necessary about the underlying mechanisms of the change than indicators are able to express.

#### 4. Conclusions

There appears to be several ways to use the indicators. The way of utilization needs to be accustomed according to the current needs of the situation. Table 1 illustrates the antipodes for the use. The appropriate model for utilizing indicators in strategic planning of natural resources appears to be closer to the communicative use than technical use.

**Table 1. Alternative functions for the indicators in a decision-making process**

	<i>Technical use</i>	<i>Communicative use</i>
<b>1. Role of indicators</b>	Tool for achieving certain goals	Tool for managing change
<b>2. Purpose</b>	To assist the management processes	To assist the social learning and interaction
<b>3. Selection of the parameters</b>	Fixed	Resilient
<b>4. Interpretation</b>	Emphasis on universal explanations	Contextual explanations
<b>5. Process of information transfer</b>	Linear	Multiple
<b>6. Power aspects</b>	Closing of the discussion. Stabilisation of existing institutional structures	Opening of the discussion for new information and for alternative interpretations. Empowering of the stakeholders.

In a complex policy context such as natural resource management indicators are foremost *communicative tools for demonstrating issues that are already known ones*. Successfully used, indicators may be tools for crystallizing the key of information flows. This kind of simplification is essentially needed to manage the currently expanding information flows within the limited resources of decision-making. Simplified information of indicators facilitates also the communication between people who have various professional background. The reduction of the information flow is, however, also the major restriction of the approach. For instance in the case of qualitative issues or while the system properties are examined much broader information basis will be needed. Under question is also to use indicators for analytical purposes as the measurements with predetermined nature are quite unlike to provide some new and novel insights.

Contrary to technical use of indicators the *circumstances of information utilization* need to be emphasized in a complex policy context. Rather than designing some universal indicator sets the efforts need to be placed on incorporating measurements into the specific informative needs of each situation (Pastille consortium 2002).

Critical point of indicator's approach lies also in making of the *interpretations*. In policy context, the measured data itself is unlike to "talk" unless it will be placed into certain context of interpretation, which is spelling out the meaning of presented data. This is essential for information to have impacts on the policy choices and for creating the expected added value.

Finally, there are also *power aspects*, which should be noted for. The dual nature of indicators makes these tools appropriate for empowering of the stakeholders but also capable for establishing of certain problem definitions and closing off the conversation from any alternative viewpoints.

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