

Workshop Report

Ecological Engineering (EE) and Decision-Making (DM)

Prepared by John Peet.

John Peet was the Facilitator for this workshop (and the Rapporteur). Andrew McCarthy gave valuable reports for the Internet discussion, each day, and his material is incorporated in this report.

We had around 15-20 participants, and worked in 3 sessions each of 1.5 hours. Most participants attended for the whole time. People were both creative and respectful of others' opinions. It was one of the more pleasant such occasions the rapporteur has been involved in!

AIMS AND OBJECTIVES

The workshop topic was deliberately broad, as the title implied, and discussion spanned the range from working within the context of free-market economics to that of hard-line command procedures, with the main inputs being clearly between these extremes. The aim was to expose a range of options, and work together towards means whereby multi-criteria decision-making processes can be developed, and explained in a way that enables people both to understand and to apply them creatively.

The process involved clear tasks for each of the 3 sessions. The first task was to get to know each other and learn about ideas people had on the topic. The second involved getting down to details, and gaining some degree of consensus on what we would concentrate on for our conclusions and recommendations. At the final session we put the material together and constructed the framework for our report back to the plenary meeting.

The report below has the main outcomes of each stage, in the form of bullet points intended to address the question of how Ecological Engineering (EE) can contribute to Decision-Making (DM), especially in the context of policy development by government, local and national.

FIRST STAGE OF DISCUSSION - MAIN POINTS

- Ecological Engineering (EE) has the ability to take a comprehensively critical viewpoint into the policy arena, and go beyond the common situation where ecologists, engineers, economists and managers talk past each other.
- EE has the potential to support DM in integration of factors involved in policy issues
 - How to bridge between engineers/scientists and decision-makers? A lot of discussion is often needed, to clarify issues/questions.
- The context in which EE works is characterised by systemic complexity.
 - There may be no “right” answer. Lack of certainty is inevitable, but may not be easily handled by many decision-makers.
 - The key may not be to identify the solution as such, but to determine what is necessary to make the decision.
 - Science may or may not provide appropriate tools for addressing these issues.
 - Ecological engineers have a duty not only to present information pertaining to sustainability, but also to advocate for sustainable solutions.
 - Changes often occur as a result of either crises or a small group of enlightened individuals campaigning for change.
- There are different hierarchical levels of decision-making - micro, meso, macro and international/global.

These are “nested”.

- Single-minded concentration on e.g. global issues can result in ignoring, blocking or damaging local initiatives.
- We should aim where possible to search for scale-*in*dependent commonalities, which can contribute to decision-making
- Process questions:
 - who are the stakeholders? What are their real needs?

 - who are *dis*franchised from the process?
 - what are the goals?
 - what are the drivers?
 - what are the constraints?

[The above points indicate the need to identify both the community/ies of interest and the context of the exercise. For example, is Growth the aim? Steady state? Some other outcome?]

SECOND STAGE OF DISCUSSION

Our aim here was to clarify the issue of Goals at the local level, and then identify Tools that will help us meet the goals. We wanted to concentrate on local EE for local situations.

We agreed to use a Case Study to help us focus on the issues before us. It was felt that we should limit ourselves to “bottom up” (democratic) rather than “3top down” (e.g. industrial) systems. It was accepted, in principle, that we adopt the principle of Subsidiarity, namely that decisions should be, as far as possible, made by those most affected by the outcome.

After discussion the Case study chosen was that of stormwater disposal. Conventional approaches involve concrete or timber channels, pipes and culverts. Ecologically-engineered alternatives could incorporate multiple values, such as restoration of waterways.

Using this Case study as a focus, policy issues discussed included:

- Environment and ecosystem
- Firm information on matter and energy flows (or metabolism, in larger systems such as settlements and cities etc.) helps focus on what is important
- Economics and information on costs or savings (in some subdivisions, there can be cost savings if EE principles are used)
- Sustainability. A paradigm block can limit communication between managers and providers.
- Use of carefully-chosen indicators
- Stakeholder involvement as critical, including the Subsidiarity principle
- In New Zealand, the “developer” is usually the main DM.
- Territorial local authorities (TLAs) are often quite flexible
- The Resource Management Act (RMA) encourages flexibility - S 32 can be used to help, and the 3rd Schedule can be used to encourage consideration of other options.
- Developers are often very conservative, but consumer demand can encourage options that may even assist the developer to make more money
- Risk aversion is widespread, perhaps more among councillors and developers than in communities
 - Inertia of current systems. The present methods are “easy”. Enlightened leaders are needed.
 - Education is central. EE is not yet a routine procedure, let alone an initial option, so we need to advocate and be assertive.
 - Ability for application of EE to assist job creation in some situations may be a helpful

input to DM

- Demonstration sites can help the process.

THIRD STAGE OF DISCUSSIONS

It had been agreed at the end of the previous session that integration of all of the ideas presented in the earlier discussions was needed. [Klang and Becker contributed substantially to this process. They subsequently worked together to produce a flowchart that describes the general approach. This was warmly welcomed by participants, and is reproduced below, on a separate page, labelled “NON-ROUTINE DECISION MAKING PROCESS: Structural scheme towards a general approach”. (an earlier version was published in *Becker A et al (2001), Nova Acta Leopoldina NF84, nr 319 pp 191-208*)]

Key ideas:

- Get the DM process out of the “routine” box and open up what is behind it: “non-routine”
- The model works best when the problem is well-defined. If not, another layer is behind it, where stakeholders are not clearly defined and expressed needs are also not well-defined. In a context characterised by Complexity, the usual Reactive approach needs to move towards being Proactive
- Identifying and encouraging stakeholders in the “community” is often the hardest part. If, however, there are too many, it is necessary to get them to form a subcommittee to liaise.
- The model is the **Context**, within which EE is to contribute to DM, alongside other approaches, e.g. infrom Sociology, Ecological Economics etc.
- It is vital to feed back **Results** for checking against **Criteria**.
- The whole process is iterative and cyclical - a **learning process**
- The media can be helpful tools for raising an issue, raising public awareness etc. Engineers are not usually good at this, but at least they need to be aware of possibilities, and try to assist the process of information sharing.

KEY CHANGE PROMOTERS

- Identification and promotion of **Drivers of Sustainable Development** rather than of economic efficiency (e.g. cost minimisation)
- Use of Case Studies, pilot programmes etc., as **educational tools** for stakeholders, bureaucrats and politicians, **together**

Some concluding points (to be taken in the context of the flowchart below)

There may be no such thing as a simple “decision-maker”.

- The process of DM is often strongly influenced by e.g. NGOs, pressure groups, powerful businesses etc., perhaps more than traditional political groups. NGOs are often more powerful at a local level.
- We in EE are “weak” relative to those powerful groups.
- Globalization is a problem, in that it can strongly affect (often negatively) national and local environmental and related initiatives, and bypasses or ignores the interests of local stakeholders.
- The criteria that are really used to make decisions are often not those that are obvious to

onlookers.

- Multistakeholder dialogue is essential, but seldom occurs. Without it, democracy is decreased.

FLOW CHART

NON-ROUTINE DECISION MAKING PROCESS
 - structural scheme towards a general approach -

