

# METHODOLOGICAL FRAMEWORK FOR INTEGRATED ANALYSIS OF DISCOURSE FORMATION, PERCEPTION AND REPRESENTATION ON AGRICULTURAL INNOVATIONS

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This presentation is an attempt to provide a methodological framework in order to assess the performance and analyse problems of adoption of agricultural innovations. I will start this presentation by providing some hints on this underlying theoretical framework dealing with systems theory (1), infer some theoretical implications as regard to agricultural innovations (2), and then describe the methodology to tackle environmental issues, and in particular agricultural innovations (3).

## 1. Rosen-Giampietro's systemic framework

The basic framework I use is derived from Rosen theory of systems. He developed a theory of modelling relation to address the systemic epistemological problems associated with quantitative modelling. Rosen emphasizes the importance of making the following distinctions:

- The distinction between the reality, which cannot be known in substantive terms, and a given perception of the reality, which depends on a given stakeholder's observation generating the perception;
- The distinction between the perception of the reality (inside the mind of a given stakeholder) and its representation (the formalization used in the model).

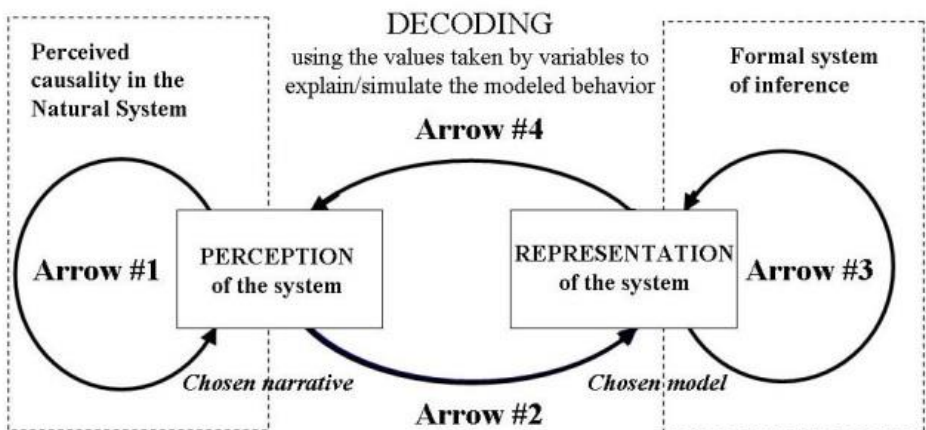


Figure 1. The scheme of modeling relation according to Rosen (1985)

Four steps are to be considered:

- Choosing a relevant narrative about the problem we want to model (in our case: a problem of adoption of innovation)
- Interfacing the narrative and representation with the external world (practices of growers, institutions, ecosystem functions, economic organization...).
- Crunching numbers
- Validation: interfacing the narrative and the representation generated in the model with the external world

## 2. Mapping agricultural innovations as systems

When dealing with agricultural innovations and when approaching them under a systemic perspective, we have to consider several characteristics:

- First, innovations have impacts on several hierarchical levels of the system: from the cultivated land (and even below), to the international market.
- Second, innovations have various types of impacts on the system: economic, social, technical, organisational, environmental...
- Third, the assessment of the types impacts and the perspective induced by the hierarchical level at stake, imply considering all the stakeholders involved in the design and the implementation of the innovation, as well as those who may be affected by it.

In regard to the Rosen-Giampietro's approach, this implies that we should not consider only one perception of the problem (*semantics*, ie the ways actors make sense out of a problem). Rather we should include all the non-equivalent perceptions of the problem. This entails that we should compress all the perspectives into a unique formal representation (*grammar*, ie the language the scientist use to transcribe the semantics).

We should also consider the ways in which the semantics of perception are informed, or manipulated, or subject to power relationships. That is to say, that we have to analyse the *discourse formation* that provides the semantics for actors.

## 3. Methodological proposals crossing textual analysis and social multicriteria evaluation

Mapping agricultural innovations as a system may then be difficult, especially if we want to assess the overall performance according to the non-equivalent points of views of the stakeholders, and take into consideration the discourse formation.

The methodological framework we propose, offers to tackle issue of adoption of innovation in considering (i) discourse formation by means of a discourse analysis (the Alceste method of textual data treatment); (ii) the semantics behind the stakeholder's points of views by means of a sorting method (Q methodology); and (iii) provide a formal representation of the performance of the agricultural innovation by means of a multicriteria evaluation (Naiade method).

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