

NIDO/KSI Appendix D - PPDO related research

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1. Introduction

The PPDO programs carried out in-house offer an outstanding opportunity to create a flexible interface between practice and science. This means that PT, PO and FTP projects will overlap perfectly, that FTP projects will have a solid basis in practice and that PT projects will also contribute to the fundamental development of knowledge.

On this common ground of PPDO and science, a cohesive research program will first be developed and implemented by interaction between practitioners and science, which will lead to an efficient use of the practical data as possible for the science and as an efficient support as possible of the science for the practice.

Three projects will be begun. Tenders will be set out for these projects, except for the EMP project (see Appendix E), which is already under way. The texts below form the core of this; various groups will be invited to formulate a more clearly defined research proposal on this basis.

The three projects can be used for evaluation. The intention is to start with an integrating project (PO) in the middle of 2005, which will synthesize the findings of the first three projects named. This can however not be further discussed here.

Research projects will also start in the context of current PPDO programs, and will deal with program specific questions of knowledge (see also § 4.5 Knowledge Project.)

2. Project 1 Learning experiences start phase

Description, evaluation and transfer of the learning experiences of NIDO, during the initiation, and the guiding of system innovations within concrete programs. The goal of this project is to define the experiences of NIDO with the initiation and guiding of system innovations, to make them transferable and to learn from them with an eye on transition management in general. It involves the Evaluation and Monitoring project already begun by the University of Amsterdam. This project concentrates on the manner in which NIDO, as an instrument of government policy, actually works. The questions are: *How are the definition and implementation of NIDO-programs and "leap projects" therein handled; how do the programs/projects relate to theoretical and methodological insights (on the basis of practical experiences elsewhere) with regard to the management of transitions; and what can be learned from these projects concerning the actual implementation of "leaps" towards sustainable development?*

See Appendix E for the interim results of EMP and the way in which it will be continued. Disciplinary lines of attack are in any event administration science (including the theory about policy orientated learning), technology dynamics and macro-sociology; where desired this will be purposefully supplemented with other disciplines. The desired products, in addition to advising during the coming years, are ultimately some scientific publications and an interactive aid. This aid must lay (hyper) connections between the way in which NIDO has actually functioned; the learning experiences that have been built up around it by boosters of all the PPDO programs collected, classified, analyzed and (partly) abstracted from the context (in which the relevant context dependencies are also identified

and it is explained how this is dealt with) and literature that deals in depth with these learning experiences and indications emerging from them.

3. Project 2 NIDO as a system instrument

Description, evaluation and transfer of the learning experiences of NIDO as a system instrument from the viewpoint of innovation and communication sciences

In the second place, it will be seen to what extent NIDO functions as an effective system instrument. System instruments form a new type of policy tools (see the review in Smits & Kuhlman¹, 2002; and also the research line Governance, §4.3 of the Knowledge project). Examples of system instruments are the activities of the program bureau DTO or NIDO. The rationale for system instruments lies in:

- The non-linearity of innovation processes (see e.g. Nelson & Winter 1977; Callon, 1992; Etzkovic & Leydesdorff, 2000), which implies that various back and forward links between various players and processes are necessary.
- The fact that it is increasingly apparent that systematic factors are to a large degree definitive for success (see the review in Smits & Kuhlman, 2002) in the practice of innovations and innovation policy.
- The fact that uncertainty, thus learning processes between diverse actors, are unavoidably necessary in innovation processes, which sets requirements for the learning ability of that system. (Rosenberg 1982; Barré et al., 1997; Leydesdorff, 2001).

System instruments are interesting against this background in those cases in which deficiencies in the innovation system – particularly in the existence of the action of the connections within it – are seen as an important obstacle for sought innovations (Smits 1994). This investigation therefore concentrates on the positioning of NIDO programs within the innovation system. It requires expertise in innovation and communication sciences and it will be launched in 2003.

Evaluation of system instruments requires a layered investigation, according to their nature (organizations with programs, which contain a series of partial activities). On one hand, the functioning of the partial activities must be investigated. The crucial element in this is the implementation of interactions and learning processes. An expertise in communication and innovation sciences is interesting for this purpose. This layer concentrates on several partial activities, which are exemplary for the whole and which cover the various functions of NIDO as a system instrument. The questions are:

- What are the common grounds between actors and partial systems and are they worked into partial activities? How did this happen?
- What (first and second order) learning processes are aimed at in various partial activities, how adequately do they function, and what factors influence this?
- How is scope provided in various partial activities for strategic analysis and the development of shared concepts and strategies, how successful is this and what factors influence it?
- The data collected in the EMP project can be used to answer questions B) and C), as can specifically collected data.

The second layer then concerns the instrument as a whole. The questions in this second project are:

- What system deficiencies have NIDO programs aimed at?
- How are these deficiencies identified and defined in NIDO programs and how is an attempt made to correct or at least to decrease them?

¹ References in this Appendix refer to the publication list in Appendix A.

- To what extent and in what way are the programs successful in this, jointly considering the answers to questions A) to C); what characteristics of the method used and positioning of NIDO/KSI contribute to the effectiveness and what factors decrease this effectiveness?
- What can be learned from this, against the background of insights from innovation sciences, concerning the functioning of system instruments in general? And what lessons emerge from this for the positioning of the Competence Center?

4. Project 3 Evaluation PPDO program

Evaluation of one or more PPDO programs from a historical and system analytical perspective. This project focuses on the systems in which NIDO has attempted to initiate and maintain an innovation. Criteria are the multi-phase model and the multi-level model. The multi-phase model (Rotmans et al., 2000) describes transitions as a long-term process of change, which follows an S-curve. The actual system innovation is brought about during the acceleration phase, in which structural changes occur as a result of interacting socio-cultural, economic, ecological and institutional changes. Crucial for success in this phase is the pre-development phase in which the nature of a condition for system innovation is analyzed. Also crucial is the start-phase, in which the process of change is initiated. NIDO has aimed its programs at these first two phases.

The multi-level model (Geels & Kemp, 2000) is based on the idea that system innovations are the result of interactions and interferences between developments at various levels: macro (the landscape, consisting of the market, the political culture, the natural environment, etc.); meso (the regimes: collection rules that direct actions) and micro (niches: the places where changes can be initiated unrestricted by the limitations imposed by the existing regime).

The following questions are asked in this project:

- What exactly is the nature of the system and the regime at which NIDO programs have aimed? How are they analyzed?
- What can be learned from the historical development of the system and the dominant regime? In particular: what options and limitations for system innovation arise from such an analysis?
- What conditions for the acceleration phase are created during the start and pre-development phases, and how did that happen? How has NIDO had an impact on existing system dynamics?
- What interactions and interferences between the various levels (micro, meso, macro) were central? And what attempts were made to initiate, promote or strengthen these? In what way did the program take complexity into account? How did the program anticipate self-organizing ability of the parties involved?
- Given the answers to B) on the grounds of insights into system dynamics, what may be said about the plausibility of the fact that the acceleration will actually be happening? What additional measures are desirable for this purpose within the ICES/KIS-3 programs? What can be learned from NIDO programs concerning the possibilities to initiate system innovations?
- Given the answers in A) through E), what can contextual historic analysis and integrated assessment add to the ability within NIDO/KSI (of PPDO) programs to define system innovations efficiently and to initiate them during the ICES/KIS 3 period?

The data and results of the EMP project can be used particularly with the questions D) and E).

The results of these three projects will be brought into context with each other in a separate integrating project. The following aspects will be considered in this context:

- Comparison of the results of project 3) concerning the pretexts for system innovations with the system deficiencies that were identified in project 2).

- The interconnection of findings concerning the internal functioning of NIDO programs (project 1) with findings concerning the effectiveness of NIDO as a system instrument (project 2).
- The formulation of lessons, on the basis of all three projects, concerning the functioning of system instruments and the implications for governance.
- A more precise indication concerning the nature of this project can only be given by the end of 2004.