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## **Wicked Problems in Sustainable Agriculture and Food Security, the TransForum Experience**

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### **Abstract**

Finding a way to manage the underlying nature of wickedness was the main challenge for the Dutch innovation program TransForum. For six years a diverse group of public and private organizations and businesses took up the challenge to develop new and more sustainable modes of agricultural production. The results were used to help develop over thirty new agricultural businesses in which different, mostly intangible values related to sustainable development were translated into tangible and marketable entities.

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## **Introduction**

Finding a way to manage the underlying nature of wickedness was the main challenge for the Dutch innovation program TransForum. For six years a diverse group of public and private organizations and businesses took up the challenge to develop new and more sustainable modes of agricultural production. The group initiated a platform under the heading “Knowledge Network Transition Sustainable Agriculture” and eventually funded a public-private partnership to execute a six-year innovation program to experiment with new business developments. While working on the dynamic change of agricultural chains and networks toward sustainable development, processes, procedures and methods to address wicked problems were identified. That was done along two lines, a deductive approach in which a method to address wicked problems was designed based on theoretical analysis, and an inductive approach in which general insights on how to address wicked problems were derived from many different case studies.

The results were used to help develop over thirty new agricultural businesses in which different, mostly intangible values related to sustainable development were translated into tangible and marketable entities.

## **Deduction: Innovation Theory Revisited**

The wicked nature of aiming for sustainable development was tackled in the scientific program of TransForum by addressing four themes that together constitute the basis for innovation: visions on sustainable development, inventions for sustainable development, organization of innovation and transitions, and market demands for sustainable products and services (Veldkamp et al. 2008).

The analysis of visions or concepts of sustainable development (theme 1) led to the insight that viewing the on-going debate on sustainable development as a discourse organized around images helps to understand the underlying values involved. Image management at different levels of scale can be applied to deal with different opinions and allows for more effective framing the challenges and thus monitoring progress. In many real life situations this element of values and framing is overlooked and leads to polarized debates on the ‘right solution’ that should be applied. Giving attention to underlying values and translate them into ‘design criteria’ that can be used to re-design business proved to be a critical element in developing action perspectives that inspired all stakeholders.

The analysis of inventions for sustainable development (theme 2) revealed that although inventions themselves are necessary, they are not sufficient for complex innovations where wickedness is involved. Since entrepreneurial drive, skills and knowhow, and institutional and societal context are equally relevant, inventions should be used to support innovation in this sphere, not to lead them. From this finding the practice was developed within TransForum to not only look at ‘hardware’ inventions (in terms of a new tool, product or process) but also at the new ‘software’ (the skills and competencies needed to apply and effectively use new hardware) and with new ‘orgware’ (the social relationships and formal rules and legislation that need to be amended for the innovation to occur).

Analyzing the organization of innovations and transitions (theme 3) led to the conclusion that large-scale, process-optimized innovation efforts aiming at revolutionary breakthroughs are less relevant in the agro domain. Instead, an approach where a large number of small-scale projects are supported will lead to a more evolutionary process of innovation that is much more suited in a situation where wicked problems lay at the heart of the need to innovate. This calls for a process oriented support of innovation efforts. As such, TransForum itself acted as a platform to exchange experiences and organize action learning.

Finally, the analysis of market demand for sustainable products and services (theme 4) revealed once more that attitudes and behavior are not always in correspondence. So, incentives toward sustainable products should be based either on increasing efficiency within the production chain, or on additional company benefits caused by increased consumer spending. The application of these insights led to the identification of three value adding strategies— or action perspectives - in which sustainable development is translated into innovative market propositions. Sustainable intensification aims at establishing a base of public support for new intensive methods of production leading to higher efficiencies and more sustainable modes of production. Sustainable valorization aims at cooperation with new chain partners to open up existing markets by translating values related to sustainable development into visible product characteristics. Sustainable diversification aims at cooperation with ‘unlikely allies’ to develop new products and markets related to agriculture, such as energy production, day-care and recreation.

The overall conclusion is that innovation aimed at sustainable development can deal with the wicked nature of the underlying problems by regarding it as an iterative process that requires a developing shared vision and a clear monitoring process as guidance. To that end, dynamic and temporary goals can be used to spur developments. This calls for intermediary solutions with acceptable levels of investment to avoid lock-in effects (Fisher et al. 2012). The notion of action perspectives as it was developed and operationalized by the Netherlands Scientific Council for Government Policy (1995) is very useful in this context. The way risks are treated and uncertainties are considered in a dynamic environment are typical for wicked problems. Setting up different action perspectives based on different priorities in values and risks combines the best available knowledge about consequences of actions with the possibility to compare different perspectives and incentivize a continuous debate on the next step forward. It also illustrates that there is ample opportunity to address wicked problems but a continuous process of making value driven choices is needed.

### **Induction: From Practice to Theory**

The promotion and stimulation of knowledge creation and innovation by public private partnerships is an often used approach in Dutch policies. Also in the case of TransForum this was seen as a good instrument to make use of use existing dynamics, to renew societal contracts and to strengthen competitive ability. For that reason TransForum was set up as a combination of public and private investments. Many projects were supported; some with a strong initiative in the knowledge institutes, others governed and guided by private corporations.

Based on the experiences in the first year, a set of five assumptions was derived from practice. Three of them reflect the wicked nature of sustainable development: (a) sustainable development

is a dynamic system property, (b) sustainable development needs system innovation, and (c) system innovation is a non-linear learning process. And two more indicate into the direction of a transformational governance structure that is needed to manage these wicked problems: (d) system innovation needs active participation of knowledge institutes, governments, civil society organizations and businesses, and (e) transdisciplinary collaboration of all relevant players is necessary (Peterson 2009).

Eventually, the assumptions were developed into principles and used to shape all following projects. With this approach the methodology of grounded theory is applied that describes the way in which a large number of findings can be used as a database on which inductive theories are built. Using a set of performance criteria it was demonstrated that the application of the principles led to a higher success rate for realizing sustainable development when a certain level of ‘wickedness’ was present (Peterson and Mager 2010).

The case-based experiences we have gathered in the TransForum program in dealing with wicked problems have been translated into a more universal applicable method: the Value Mediation Method®. The method guides the process of developing new businesses in five steps. It combines the experiences of the TransForum program into a hands-on approach toward creating shared values in business as described by Porter & Kramer (2011). Essential in the approach is to postpone the urge to come up with a ‘solution’. Instead, focus on what constitutes the common challenge and how this challenge is related to the different underlying values of the relevant stakeholders. Then actively build a coalition to co-create new business models. In many cases this coalition will encompass some ‘unlikely allies’—for example former adversaries—that have proven to be critical in coming up with new design criteria leading to innovative business ideas.

## **Towards a Set of Recommendations on the Basis of Lessons Learned**

The combination of deduction and induction in the TransForum program made it clear that there is no blueprint for a single method to deal with wicked problems. This is in line with notion that wicked problems have no single solution and therefore cannot be solved, but must be managed.

The deductive analysis of the elements of the innovation process revealed that setting up different action perspectives based on the different underlying values can help to kick-off managing the wickedness of the underlying conflicts. Combined with the recognition that innovation calls for hard- soft- and ‘orgware’ renewal and that different strategies can be used to translate sustainable development into business characteristics, the challenge for setting up an effective innovation process becomes clear.

The inductive development of a set of principles and a more general applicable Value Mediation Method underlines the need for structured process architecture. The application in some thirty projects has shown that a significant higher success rate emerges if the principles are applied systematically. It is also became clear that this mode of operation is overkill in situations where the underlying conflicts are solvable, or in other words, when it becomes clear that no wicked problem is hiding under the surface. Six years of experience in the TransForum program shows

that principles and structured processes help to address wicked problems and realize tangible steps into the direction of sustainable development.

The TransForum model can be used as a guideline for further refining modes of operation to manage wicked problems in agriculture (van Latesteijn and Andeweg 2010). At present the Value Mediation Method is available as a practical tool to address new challenges. However, more experience and theoretical insight has to be built up in combining analytical insights from inductive analyses with deductive understanding of dealing complexity and wickedness in real life situations. The combination of the two will help us to manage wickedness and shape our future by combining analysis with action.

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