

## **Coping with turbulence; strategies for agricultural research institutes**

Paper presented at the Euragri workshop "Research management of agricultural research organizations", Jokioinen (Finland), 11-12 September 1997

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## Introduction

This report is adapted from the paper delivered at the workshop of Euragri - which stands for European Agricultural Research Initiative; a group of representatives from European agricultural research institutes and related bodies.<sup>2</sup>

The main differences between this paper and the spoken version are in this introduction and in the literature references.

The structure of this paper is as follows. It starts with a very short description of the NRLO and its working programme. Subsequently, two 'schools of thought' on strategic management are discussed, and one of these - 'modern strategic management' - is treated more in detail. This treatment gradually focuses more and more on the significance of modern strategic management for agricultural research organizations in Europe.

The paper could be summarized by the following four statements:

1. Strategic management should not be identified with strategic planning;
2. Research organizations may learn a great deal by examining how both industrial and service organizations apply strategic management, even if the strategic management of research organizations has several specific qualities;
3. Strategic management by agricultural research organizations in Europe should be directed towards creating new opportunities and conditions for the agrosector while solving contemporary problems;
4. This task will make extremely strong demands on the operational management of agricultural research organizations.

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## About the NRLO

But first the NRLO, of which I will present a very condensed historical overview (Rosenboom and Rutten, 1996) as well as the main ingredients of its current working programme (NRLO, 1996).

Established in 1957 the NRLO was designed to promote and co-ordinate agricultural research in the Netherlands. One of the means to achieve this was by organising consultations about both physical and staff requirements as well as the research agenda with a great number of interested parties, followed by a formal advice to the responsible Minister of Agriculture.

Until approximately 1970 the Council focused primarily on the promotion and co-ordination of agricultural research. After 1970, medium-term programming became one of the Council's more important functions in addition to co-ordination. From 1985 onwards the Council's role as a co-ordinator gradually declined and its primary focus shifted towards medium-term planning and foresight studies. As of 1995, our primary task has been to facilitate and strengthen the strategic management of agricultural research organizations in the Netherlands. This is achieved by conducting foresight studies in close collaboration with stake-holders within the agricultural knowledge system of the Netherlands.

Our current working programme is divided into the following themes and issues:

1. The position of agriculture and nature in the 21<sup>st</sup> century;
2. Rural development;
3. Marketing, processing and production systems in the 21<sup>st</sup> century;  
with sub-themes:
  - 3.1. Internationalisation and globalisation
  - 3.2. Markets and consumer behaviour in the 21<sup>st</sup> century
  - 3.3. Use and emissions of pesticides, nutrients and energy
  - 3.4. Animal health
  - 3.5. Future scientific and technological developments
4. Fish and fisheries;
5. Organizing innovation.

So much about the NRLO. In the course of my presentation I will go into the nature of foresight studies in somewhat more detail, including a more specific definition, their main tools and the lessons learned from them thus far.

## **Strategic management - a basic definition**

What is strategic management? According to a very general description, strategic management is about adjusting organizations to changes in their environment or about efforts to affect the environment (De Man and Coun, 1995). The purpose of strategic management is to preserve or to bring about such an interaction between organization and environment that the organization's continuity and vitality are not threatened in any way or may even have better chances of being attained.

These are dangerously simple definitions. What is meant by 'adjusting', by 'affect'? And what exactly is the 'environment'? For the sake of brevity I will focus my attention on those answers that would be given by two schools of thought in strategic management, i.e. so-called traditional strategic planning and so-called modern strategic management.

### **'Traditional' strategic planning**

In the strategic planning perspective dating from the sixties and seventies, which has become traditional by now, these core concepts of 'adjusting to changes in the environment' were taken very precisely. To start with the environment: in traditional strategic planning the environment is seen as what happens beyond the boundaries of the organization; in other words, the basic assumption was that the organization and the outside world were strictly separated. The awkward thing with an organization's environment, however, is that it can be very extensive and very complex. And if the environment is going through a process of change - and when does it not? - an additional fundamental uncertainty concerns the nature of those changes. As a result, strategic planning was intended primarily to achieve a highly accurate demarcation of the environment relevant to the organization: who are the clients, what are the markets and what factors have direct effects on clients and/or markets? In short: environmental analysis. A second major task of strategic planning was to achieve maximum reduction of uncertainties in the environment by collecting information about the likelihood and severity of possible changes. In short: prediction and forecasting. Armed with the results of environmental analyses and with relative certainties about the future planners were in a position to carry out their third, and all-important, main task: closing the gaps between the present and the future. If they were real die-hards, strategic planners made a long-range plan, which was then used throughout the organization as a basis for any other plans made by its divisions, departments and other units. It is a caricature of top-down planning, trimmed with immovable targets and budgeting processes, solid criteria, control instruments and other rigidities.

But let us be frank: even in its most trivial form strategic planning is not without its virtues. The first reason is that organizational strategy should always be formalized to some extent, as internal communications within the organization cannot do without it. Secondly, it is certainly possible to predict changes in an organization's environment, at least to a certain degree or at specific moments in time. However, this second virtue will vanish when changes in the environment demonstrate such a high degree of uncertainty that it would be useless to try and predict them. This is what is called a turbulent environment in professional jargon. A turbulent environment may be compared with a football match where not only the rules of the game are subject to a constant process of change, but also the playing field itself. Traditional strategic planning is unable to cope with that.

## **'Turbulence'**

In contrast, modern strategic management professes to be able to cope with the turbulent environment that is typical of today's society. The fall of the Berlin wall and the disintegration of the Soviet Union and the Eastern bloc are mega-illustrations of a changing playing field and changing rules. The same applies to withdrawing government authorities throughout the Western nations, the strong emergence of a select group of former developing countries, the global, social and economic impact of ecological damage that is caused all over the world, and a highly intensified competition for the favours of consumers who seem to have grown all-powerful.

## **'Modern' strategic management**

This type of mega-trends - of which it would be easy to find more examples - requires a different interaction between organization and environment than the type of interaction that used to be the basis of traditional planning. Essentially, the gurus of modern strategic management tell us that the nature of our times makes it necessary to remove the division between organization and environment as much as possible. From the richness of the literature in this field it can be concluded that, in order to fulfil this task, the management will have to invest a great deal in three interdependent key activities:

1. Developing foresight (rather than forecasting techniques in order to reduce uncertainty);
2. Building core competencies (rather than taking market presence for granted);
3. Partnersshipping (rather than avoiding competitors).

For each of the three activities I will discuss how they are defined and what their relevance is to the task of achieving a maximum reduction in the division between organization and environment.

## ***Developing foresight***

Foresight studies have become a major instrument in strategic management. They are not designed to develop the clearest possible picture of a most likely future, but rather to achieve maximum clarity in a picture representing both conceivable futures and the opportunities and threats which those futures might entail for the organization. Their main function is twofold. Firstly, they serve to maintain an active orientation towards any changes in the environment, to ensure that strong as well as weak signals emanating from that environment will be discussed and examined. The important thing here is to explore a very wide area, not limiting oneself to signals from one's familiar environment. For national agricultural research organizations this would imply that they should not only take into consideration signals from the fields of agriculture, agricultural policy-making and agricultural research, but should also examine signals from other economic sectors, general policy-making, other technological domains and, finally, other countries.

The second function of foresight studies is to initiate and maintain a discussion about how to interpret changes in the environment. With this I mean the following: once the opportunities and threats of conceivable changes in the environment have been systematically explored within the organization, two things will happen spontaneously. The potential impact of developments on the organization will be analysed in terms of their positive and negative elements while the organization will be forced to think about its present qualities. After all, whether a particular development constitutes a threat is not only dependent on the nature of the development itself, but equally on the ability of the organization to adequately respond to it.

Let me give an example to illustrate the two functions. It cannot be denied that government bodies are increasingly unwilling to go all the way of 100 per cent financial support for agricultural research. Superficially, it might be considered a threat if an organization that has been given government lump-sum input funding over the last few decades, should now have to conclude that this source of income would run dry within a couple of years. A logical interpretation would seem to imply 'cutbacks'. Yet it will not take a great deal of reflection to conclude that a reduction of input funding may also have its attractions. One of them will be that institutions are given the possibility to carry out assignments commissioned by other clients than government authorities - and to do so on a competitive basis. If that line of action proves to be successful, cutbacks may even be ruled out. In fact, the result may be quite interesting because it will not only lead to an increased understanding of other rules of other games, but the playing field will suddenly change as well. First, however, more thought should be given to the question whether the organization is actually organised in such a way that it is in a position to work for other clients and to compete with commercial organizations? More often than not, many changes will be needed in both the structure and culture of an organization to achieve this.

These two functions indicate that developing foresight not only entails study and analysis of trends and their impacts - it also and foremostly entails developing new problem definitions, creative processes, and institutional frameworks.

### **Building core competencies**

What are core competencies? Despite its commercial terminology I might best quote here from Hamel and Prahalad (1994), who have given a very straightforward definition:

“A competence is a bundle of skills and technologies rather than a single discrete skill or technology. (..) To be considered a ‘core’ competence, a skill or technology must meet three tests:

- a) (it) must make a disproportionate contribution to customer-perceived value; (..)
- b) (it) must also be competitively unique;
- c) (it) forms the basis for entry into new product markets.”

Building core competencies implies a continuous assessment of the adequacy of the current profile of the organization. Profile, i.e. the collection of images of an organization - images that are held by customers, by suppliers, by colleagues, and by the employees of the organization themselves.

I will readily admit that this strongly reflects the jargon of commercial, profit-oriented enterprise. Still, the idea that organizations should be constantly reflecting on the nature of their actual strengths, equally applies to the strategic management of agricultural research organizations. Depending on their market orientation it would then be necessary to translate concepts such as skill, customer-perceived value, competitive uniqueness, and product markets into terms that are more appropriate for research organizations.

### **Partnershiping**

It is an interesting characteristic common to many views of modern strategic management that they propagate a combination of competition and co-operation. Although this would seem impossible, it is not. When organizations successfully stress their distinctive features and make their strength and value known to the public, they will be in a good position to share several organizational activities with others. In my view, the emphasis by modern strategic management on partnershiping or on forming alliances is of great significance to agricultural research organizations. The underlying assumption behind the emphasis on partnershiping is that even very large enterprises will find it impossible to realize certain innovations. The financial, technological and market-dependent risks involved may be so great that corporations are faced with a choice between abandoning their innovative efforts or trying to find the right partners. In technological domains that are growing strongly - particularly telematics and multimedia - it is now becoming more and more common that

companies who used to fight each other to the death are now combining their efforts in pursuing innovations. These alliances will continue only as long as they are needed; they will not automatically lead to mergers. It is particularly interesting to observe that universities and research organizations may also be a party in this type of alliance. Naturally, this will be subject to the condition that they are allowed to do so and that they are adequately organised for working with and for commercial enterprises.

## **'Modern' strategic management and agricultural research organizations**

What is the relevance of all this to the management of agricultural research organizations? Let us start with the environment of those organizations. Are there any signs of turbulence there? It is my firm impression that the environment of agricultural research organizations in Europe is indeed extremely turbulent. More specifically, at least four developments in both the rules of the game and the playing field are of particular interest to agricultural research. Consequently, the same four trends are of great importance to the management of agricultural research organizations.

### ***Trends in the environment of agricultural research organizations***

The first development - to which I briefly referred before - concerns the changing role or attitude of government. In many Western countries, deregulation and privatization of what used to be full-scale government affairs have also struck hard in agricultural research. In most countries agricultural research has been the almost exclusive domain of government bodies for many years. It implied that research institutions were paid by government authorities while they were directed and in many cases even fully managed by civil servants. However, this traditionally strong dominance by government authorities has been rapidly decreasing in practically all Western countries. There are national differences in both the pace and the extent with which governments reduce their involvement with this type of research but the general trend is unmistakable, as are its consequences for agricultural research organizations.

A second development involves the fact that various technologies meet in a single area of application. Today, multimedia applications are booming because telematics, computer technology and video technology have found one another. In the agricultural domain we can see how sensor technology and biotechnology are combined.

The third development is that whole branches of industry have quickly become uprooted from their national basis. In the sector of agriculture, too, entrepreneurs increasingly find it quite logical to ask themselves whether it would be better to move their centre of activities elsewhere.

Development number four involves what I would call the fractalization of agriculture. This is meant to imply that the homogeneous quality of both agriculture as a branch of industry and its branches of production is fragmenting at great speed. I will deal with this tendency in more detail as I believe it is the least recognized of all four. A few examples from the Netherlands to illustrate what I mean: entrepreneurs in horticulture under glass have long felt scarcely any connection with cattle-farmers or arable farmers. A similar division is now emerging within branches of production as well. Vegetable growers, in their own opinion, are in an altogether different line of business than those active in floriculture, and even entrepreneurs in the eggplants branch have little affinity with those in the branch of growing tomatoes. This is not the result of a growing lack of solidarity, a general tendency towards individualization, or anything like that. The main cause, I believe, can be found in the strongly increasing knowledge intensity in agricultural production - and in the growing awareness among entrepreneurs in agriculture that the quality of their information management will be a crucial factor in maintaining the continuity of their business. Core competencies indeed! That is why leading dairy farmers won't have much to learn from top-ranking horticulturists - or not more than they might learn from any prominent businessman dealing in, say, personal computers, for that matter. Rather, farmers will turn to entrepreneurs who may provide them with the knowledge and technology they need. First of all, they are their suppliers and clients - not their farming colleagues who are active in quite different product-market segments.

Thus, the environment of agricultural research organizations may be rightly called turbulent. Does that mean that the 'recipes' of modern strategic management can be applied to agricultural research organizations just like that? The answer is both positive and negative. Research organizations do not produce computers, pizzas or milking machines. Essentially, they produce intangible items that can be grouped under a single heading, i.e. knowledge. This seemingly trivial observation has far-reaching consequences for the strategic management of agricultural research organizations. I will mention three of them here:

1. Knowledge that is, or may be, relevant to society can never be generated exclusively by research organizations. For example, apart from universities and R&D labs of large corporations, professional consultants also make great contributions to the production of knowledge. And in addition to those typical knowledge institutes - i.e. institutions whose formal task it is to produce knowledge - it is increasingly recognized that other kinds of concerted action produce knowledge as well. A significant illustration in the Netherlands is the phenomenon of study groups: small groups of agricultural entrepreneurs, active in a common branch of production, who meet to solve their problems together and to investigate new possibilities - frequently without any interference from people associated with the knowledge institutes mentioned before. The conclusion should be, therefore,

that socially relevant knowledge is produced by a highly varied crowd, including research organizations.

2. In several respects, the economics of producing, utilizing and encouraging others to make use of knowledge is fundamentally different from that of making and selling computers or milking machines. Let alone pizzas. One of the outstanding characteristics of many forms of knowledge is that they show a great deal of similarity with public goods. In a way they are non-rival goods, which is to say that their use by individual A does not preclude their being used by individual B. Apart from being non-rival, knowledge also is non-exclusive to some extent, in the sense that fresh applications resulting from knowledge development may be imitated. As a result, it is not very attractive for individual entrepreneurs to invest heavily in knowledge development because, as a general rule, it will be difficult for them to appropriate the benefits of those investments. These qualities of knowledge may explain why many knowledge institutes - universities, professional training courses as well as research institutes - are still paid mainly out of public funds. At the same time, this explanation is beginning to lose its validity. Firstly, because knowledge development has become much too important to private enterprises. This is one of the reasons why, with increasing frequency, they contribute to knowledge development - either by investing money directly or by buying its products. Furthermore, the above explanation has also been losing ground as a result of the understanding that, as branches of production are more knowledge-intensive, it will be more difficult to use fresh knowledge in the appropriate ways. Or, to put it differently: transfer of knowledge in itself not only requires great financial and technological efforts, it also requires competence per se. As a result, knowledge is a means of production that is many times more difficult to handle than ready-made technologies such as milking machines.
3. Thirdly: when is knowledge relevant? When is it that fresh knowledge satisfies Hamel and Prahalad's criterion of 'customer-perceived value'? As far as tangible means of production are concerned, the answer is fairly simple: their relevance will be reflected in their sales record. In the case of research organizations the issue is considerably more complicated: should we take their turnover as a measure of relevance?

In the context of strategic management this question should obviously be seen in a broader perspective as it involves long-term 'customer-perceived value'. And 'customers' may come in many forms: as clients giving specific assignments, as colleague researchers in other knowledge institutes, as a Minister of Agriculture, as a farmers' association or as a social organization. To give an indication of what should be understood by customer-perceived value I will draw on the NRLO foresight studies.

## **Challenges for agricultural research organizations**

The gist of the argumentation which has resulted from the foresight studies runs as follows: the opportunities and threats faced by the sector of agriculture today are so numerous and so potentially drastic and multifaceted that incremental innovation will not be sufficient. To avoid any misunderstanding I should add that, in this reasoning, the agrosector not only refers to primary agriculture, i.e. the collection of arable farms, animal husbandry and horticulture. It is also understood to include the clusters of businesses in supplying industries, service organizations, wholesale and retail trade, and processing companies. And I also believe it should include those activities and values in the countryside that are somehow related to agricultural activities. In order to safeguard the vitality or, if you like, a more sustainable development of the sector for the next ten or fifteen years, two large-scale efforts will be needed in the view of the NRLO (Verkaik, 1997):

1. strongly reinforcing the agrosector's orientation towards markets and consumers;
2. reassessing the social role and the social performance of the agrosector.

To take up this twofold challenge, which will probably sound quite familiar to you, it will no longer be sufficient to optimize existing processes in many cases. It might even backfire when things continue as they are. For this reason it is extremely important to examine those areas that will need innovations of a non-incremental nature at higher aggregate levels. I would call them innovations at system level or system innovations. The significance of modern strategic management will suggest itself immediately since strategic management not only involves finding an adequate response to changes in the rules of the game or in the playing field, but because it is also based on the ambition to be a party in effecting those changes in the rules of the game. Companies will do this by developing entirely new products or new markets. Agricultural research organizations may be able to achieve this by designing new patterns of activities within or surrounding the agrosector. What, then, are the new designs and system innovations that are involved here? What do they look like? And what role, exactly, is played here by agricultural research organizations?

## **New roles for agricultural research organizations**

Allow me to deal with the last question only. Again I will draw on the data that have thus far resulted from the NRLO foresight studies (Verkaik, 1997). It is our impression that research organizations will have to transform themselves in two ways - if they are not busy doing so right now.

The first transformation should be that they set themselves up not only as problem-solvers, but also as the architects of new futures for the agrosector. Their aim should not be to impose their blueprints, but rather to be a source of inspiration to innovating entrepreneurs and interest groups.

The second transformation should be that they set themselves up as actual co-innovators. Not only should they devise future perspectives in collaboration with other interested parties, but they should also be a party in the realization of those plans.

It is my view that both transformations will also have strong repercussions on operational management in terms of human resource management, leadership cultures, marketing strategies, and portfolio management. They are the instruments that will have to be employed in order to realize the three core activities of strategic management in individual agricultural research organizations, which are:

- developing foresight;
- building core competencies; and
- partnershiping.

I thank you for your attention.

## References

Hamel, G. and C.K. Prahalad. *Competing for the future*. Boston (MA), Harvard Business School Press, 1994

Man, H. de, en M. Coun. *Kennismaking met de organisatiekunde*. Utrecht, Lemma/Open Universiteit, 1995

NRLO. *Jaarverslag 1995*. Den Haag, NRLO, 1996

Rosenboom, J., and H. Rutten. "*Financing agricultural research in the Netherlands - The changing role of government*". Paper prepared for the International Economic Conference on Global Agricultural Science Policy for the Twenty-first Century. Melbourne, August 1996.

Verkaik, A.P. *Uitdagingen en concepten voor toekomstig landbouwkennisbeleid*. Den Haag, NRLO, 1997. NRLO Report 97/17