Policy Brief EU Access

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This is the first issue of the Policy Brief of the EU Access programme, a co-operation programme on sustainable agricultural supply chains in pre- and post-European Union accession countries. This programme started at the request of the Ministry of Agriculture, Nature and Food Quality of the Netherlands and is now running in co-operation with partners from Poland, Hungary, Czech Republic, Slovak Republic and Cyprus.
This quarterly Policy brief intends to inform you about a specific theme that follows from the EU-Access programme. A Newsletter is also published and informs you about new developments around the various projects of the programme.

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Investment in applied horticultural research pays off very well

The results of a study on the cost-benefit analysis of applied agricultural research in two EU Member States, the Netherlands and Poland, were published in a joint report[1]. This policy brief summarises the main findings. Literature has often shown the large benefits of agricultural research. Governments used to be committed to finance such research; during recent years, however, there has been a shift in priorities. Privatisation and restructuring of agricultural research in new EU Member States put additional pressure on the continuity of applied agricultural research in these countries.

In order to assess the costs and benefits of applied horticultural research we carried out a study with four large horticultural crops[2]. Two fruit crops: apple and pear, and two vegetable crops: carrot and onion. Important indicators for return are the Net Present Value (NPV) and the Internal Rate of Return (IRR).

Large returns

The returns to society were usually high. IRR outcomes ranged from 81 % to 14,113 %. The NPVs ranged from € 1 million for the least profitable project to € 464 million for the most profitable project. While results are probably an overestimate, even if the true gains to society would be a factor 10 lower, the conclusion that applied horticultural research is a profitable investment remains firm. High NPV values were found in cases with high adoption rates, substantial acreages, and significant yield increases. High IRR values were found in cases with a short adoption period.

Conclusions

This study yielded the following main conclusions:

1) Applied agricultural research provides large returns to society. An evaluation of five applied research projects in horticulture, three in Poland, two in the Netherlands, confirms this pattern. There were large returns for seed treatment research in Poland. Carrot research produced a return of over 4,000 %, onion research returned over 700 %. A third Polish project, on chemical thinning of apples, returned modest losses. These three projects alone generated a total NPV of over € 450 million in Poland. Results have been adjusted downwards for the bias of evaluations at project level instead of at programme level. Although the results are probably an overestimate, even if the true gains to society would be a factor 10 lower, the conclusion that applied horticultural research is a profitable investment remains firm.

2) Impact assessment is hampered by data problems. The evaluation of agricultural research in the new EU Member States in Central and Eastern Europe and in the Netherlands is hampered by a lack of data on costs and benefits of agricultural R&D. The research structure in Poland and in the Netherlands has no routine of assessment (ex-ante or ex-post) of the impact of the research programmes in these countries.

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3) Continued (or even expanded) public agricultural research in the new EU Member States is justified but the policy incentives for private R&D must be favourable. Concerns regarding rural development and the evolution of public concerns on agriculture –such as food safety, animal health and environmental protection– provide strong justification for continued public involvement in agricultural research. In other areas of research, especially in plant breeding, governments must provide a favourable context for private research by defining and enforcing intellectual property rights (IPR) and by providing the conditions for effective linkages between basic research and applied research. Thus, governments can play a significant role in stimulating private investment in agricultural R&D.

Public responsibilities

While exceptions exist, in emerging economies agricultural development is the key to poverty alleviation and rural development, and to transformation of the economical structure. And when emerging economies do develop, the demands on agriculture change: consumers shift their diet towards higher quality products, and governments increasingly seek to satisfy public concerns concerning consumer health hazards and environmental degradation. Many of the new EU Member States in Central and Eastern Europe are in such a phase of agricultural transformation. An effective agricultural research system is a critical support factor in the process of change, as important as competitive markets for input and output, and proper incentives for entrepreneurship. The public sector holds several responsibilities in supporting an effective agricultural research system.

Incentives for private research

Over recent decades the research orientation of the public sector and of private companies has changed in response to changes in global food markets and public priorities, especially in developing countries. Private sector research has increasingly ventured beyond traditional areas such as production mechanisation and the use of chemicals for yield improvements.
In plant breeding, private companies have taken over the dominant position from the governmental research system. Growth prospects in variety development (breeding) and the seed industry are positive. The worldwide decline in food prices that has been continuing for several decades pushes the need for ongoing productivity gains. In addition, maturing consumer markets around the world demand an increasing variety of products and product qualities.
With such obvious outlet opportunities for improved seed, the fact whether private companies will actually invest in R&D depends to a large extent on government policies.

1. The intellectual property rights (IPR) policy will provide incentives (or disincentives) for private investment. The more companies can be sure that they will reap the exclusive benefits from R&D, the more they will be inclined to invest.

2. Insights from basic agricultural research must be made available for applied research and technology transfer. Productivity of the total research system depends to a large extent on the interaction between the basic-applied-technology components and the required technology transfer to end users and the implementation by these users. By setting up a system to make the results from basic research and applied research (either done in the home country or imported from abroad) accessible within the country, government provides critical support and favourable incentives to private sector investment.
As Fuglie notes "…effective linkages between public and private research laboratories can increase the productivity of both parts of the system" (Fuglie *et al.* 1996: 52).

Public research in case of private underinvestment

Governments are found to have a direct impact on the profit potential of private R&D in breeding, and thereby on the scale of private agricultural R&D.
Even when policies, like a policy on Intellectual Property Rights (IPR policy), and the options for interaction between research subsystems are favourable, it cannot be guaranteed that private firms will actually invest in R&D up to the desired levels. Then, governments may want to step in and provide public research. This is justified for at least two fields that are relevant to the new EU Member States in Central and Eastern Europe.

1. Rural development
   Poverty and unemployment in Central and Eastern Europe is concentrated in the rural areas. For most rural regions, the very kernel of economic growth lies with increased agricultural productivity (Timmer 2002). Private firms, however, may well underinvest in regions with the strongest need for productivity growth. There are several elements why rural R&D might fail to deliver.
   (a) Typically, it will take a long time before the benefits of research can be reaped. As shown above, the returns under gradual development (or slow adoption rates of new technology) are much lower than under rapid technological change and quick adoption. Private firms are generally less patient.
   (b) The institutional setting in poorer regions is typically less favourable to investment than more developed regions: remoteness reduces the links with basic research and applied research. IPR policies are enforced less, so that firms experience difficulties in securing the exclusive returns on their investment due to a lack of law-enforced intellectual property rights.
   (c) The local demand for improved varieties is low.

2. Evolving public concerns regarding agriculture.
   The accession to the EU has boosted regulations on public concerns relating to agricultural production and the food supply chain. Such concerns include food safety, animal health, animal welfare and environmental degradation, and have been implemented in requirements regarding food products and the process of production, processing, handling and transport. The process of change requires support from research, especially in support of smaller companies. Business strategies to comply with new regulations differ across firms (Reardon *et al.* 2001). Large (often international) "agribusiness" companies will use the change in policy to differentiate from competitors by raising standards above mandatory levels. Small and medium sized companies will often respond to changes in regulations by asking government support. While agribusiness dwells on the insights from global product development and product quality control, the small and medium-sized companies will turn to the agricultural research system for guidance in complying with evolving public concerns.

Elements of an effective applied research system

In our view, the system for applied agricultural research should support agricultural development by enabling:
- production of quality food commodities
- the development of new concepts for production, handling and marketing
- contributions from agriculture to nature conservation and biodiversity

The system should be able to deal with the present dynamics in agriculture and food production. We argue in our report that society's demands on the agricultural research system are evolving from preoccupation with yields and costs of individual products to concerns regarding safety, quality and variety on the one hand and environmental implications of production processes on the other.
The driving forces behind such changes include globalisation (outsourcing of raw materials, supply of primary products), market liberalisation, technological advances, and the changing role of national governments. Additional challenges are presented by the increasing desire for sustainable production systems.
The objective of the applied research system is to incorporate such dynamics and to translate relevant basic research into custom-made solutions in the green chain and/or in the food chain.

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[2] *This study was funded by the Ministry of Agriculture, Nature and Food Quality of the Netherlands, within the framework of the EU Access program (400-VI).*

Countries of the EU

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- France
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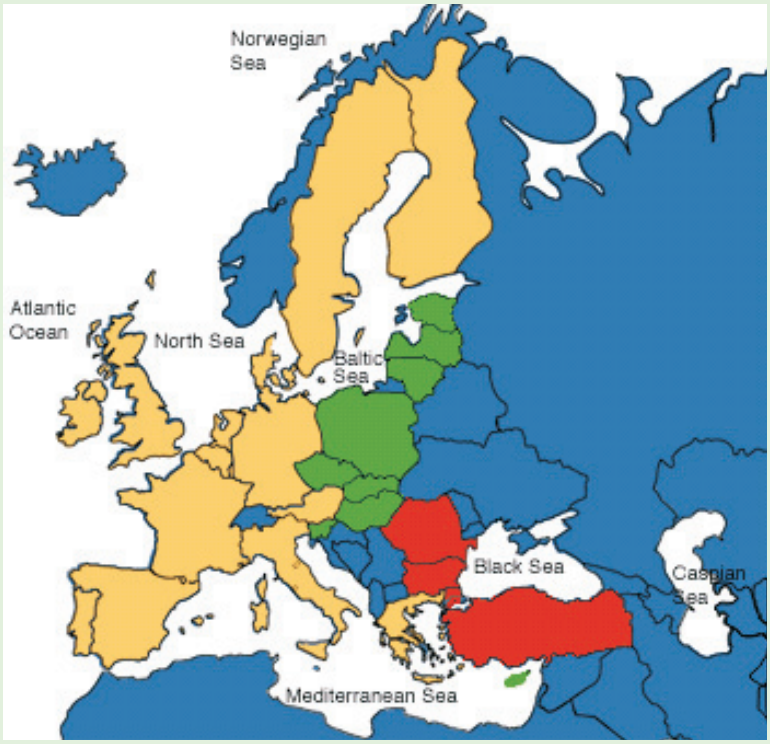

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Three institutes of WageningenUniversity and Research Centre are involved in this progamme: Applied Plant Research (PPO), International Agricultural Centre (IAC) and Agricultural Economics Research Institute (LEI)

The EU Access program is sponsored by the Ministry of Agriculture, Nature and Food Quality of The Netherlands.

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