Contribution of organic agriculture to macro-economic and environmental performance of the countries with economies in transition

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Summary:

The current agricultural operations cause a number of environmental and socio-economic problems and raise substantial ethical doubts. The call for the shift of the present agricultural paradigm and practices is acknowledged all across Europe. Ten years after the economic transition, the agricultural sector in Central and Eastern Europe (CEE) still undergoes essential transformation. In spite of the policy efforts to restore the pre 90 inputs, low-external input agriculture prevails in most CEE countries. The transition to a market economy caused a huge price disparity between the agricultural commodities and agricultural inputs. The high prices of agri-chemicals and low prices of agricultural produce forced farmers to reduce agricultural inputs or refrain from using them altogether. However, this shift was not the result of a designed agri-environmental policy but rather the consequence of a socio-political evolution from state economy to market economy. The low-external input agriculture as it is practised today in the CEE is not truly sustainable. It results in poor economic returns and often cause a whole spectrum of environmental/nature degradations (e.g. soil erosion, nutrients leaching, etc.). Organic agriculture is improved and more sustainable form of low-external-input agriculture. Currently some 380.000 hectares of the agricultural land in the CEE are being farmed according to the organic agriculture principles and standards. The existing calculations from the region show that a share of as little as 10-20% of organic farming in the total agricultural production already exhibits benefits for the national economy and reduces the environmental degradations induced by the agricultural production, notably the nitrogen losses. If the external costs of agricultural production were internalised, the organic farming exhibits even greater environmental and economic benefits.

Introduction: problems of high-external-input agriculture

Most of today's European agriculture is based on high-external inputs such as agri-chemicals, genetic material and non-renewable energy. Economy of scale and mechanised operations resulted in large, highly specialised farms that function like factory units (Znaor and Bošnjaković, 1996). In the last decades the high-external agriculture has achieved enormous success in terms of yields increase (output/ha or animal unit) and decrease in labour requirement (manpower/ha or animal unit). This success of high-external-input agriculture and a pride about a great victory over nature made us blind for a number of negative side effects and problems associated with this type of production.

Agricultural activities affect both quantity and quality of nature and the environment. Agriculture has substantial impact on soil, water, air, as well as on species, habitats and landscape diversity (Mansvelt van and Znaor, 1999). Numerous studies point to agriculture as the single biggest factor responsible for soil and water pollution (nutrients, pesticides, heavy metals and pathogens), as well as for the destruction of biodiversity (Znaor, 1999; Haskoning, 1994; Pimentel, 1993; RIVM, 1993). Among the environmental compartments most severely threatened by unsustainable agricultural practices are soil and water (Znaor, 1999; Haskoning, 1994; Ongley, 1996; OECD, 1987). For soil and water, agriculture represents a major, much more serious source of pollution than any other sector (e.g. industry, transport, population, etc.), or sometimes all other sectors together (Znaor, 1999; Haskoning, 1994; Rekolainen and Kauppi, 1993; RIVM, 1993). Available data indicate that in many regions of Europe, agriculture alone is responsible for more than 50% of the total nutrient load borne by water (Znaor, 1999). Besides, agriculture is substantial water user and threatens water habitats. Many surface and groundwater resources are exploited beyond sustainable levels and agriculture contributes to this problem by drawing off a considerable volume for irrigation purposes (Pimentel et al., 1997).

However, unlike other sectors particularly industry and transport, agriculture is at the same time both the source and victim of environmental degradations. While suffering from the consequences generated by its own practices, such as erosion, building up of pests and diseases, climate change, agriculture is at the same time an important factor in preserving natural resources and biodiversity. Farmland is for instance the most important habitat type for threatened European birds, and the main element determining the quality of European landscape (Mansvelt van and Lubbe, 1999; BirdLife International, 1997).

Last but not the least, high-external-input practices raise a number of (ethical) questions such as those related to the use of genetically manipulated organisms, animal welfare, declining food quality and associated health hazards (Znaor and Bošnjaković, 1996). The economic profitability of the high-external-input farms is being questioned, too.

Current farming situation in the countries with economies in transition

The economic transition in Central and Eastern Europe (CEE) over the last decade resulted in rather drastic changes in the agricultural sector. Food production and food consumption in CEE have declined considerably since 1989. Prices of agricultural inputs increased substantially higher than prices of agricultural commodities. While input prices and sometimes retail prices in some CEE countries have almost reached levels of the international market, prices of basic agricultural products remained almost a factor three below (Beaumond

and Montiel, 1995). This induced severely negative profit margins for farmers. Farmers' reaction to this trend was very simple and logic. Since the costs of (expensive) inputs do not pay back through the (cheap) agricultural commodities sold, farmers substantially reduced the use of agri-chemicals or refrained from using them altogether (Figure 1.) (Kieft, 1999; Znaor, 1997). This resulted in a drop of fertilisers and pesticides consumption by over 50% in comparison with levels applied in 1985-89 (Kieft, 1999; OECD, 1999; Beaumond and Montiel, 1995). Low input and small-scale, labour intensive agriculture has become the most predominant type of farming in the most CEE countries. The investments are restricted to some very basic costs (e.g. seeds) and the production is not market oriented, but rather subsistence oriented (Znaor, 2000).

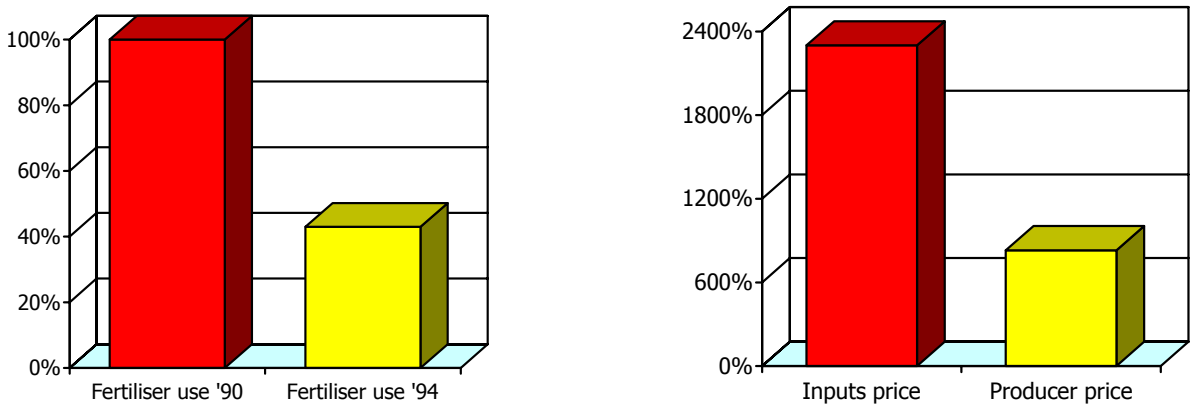

Figure 1. Relative changes of fertiliser use, agricultural inputs and producer prices in Bulgaria in the period 1990-1994.

However, the shift from high-input to low-external-input farming in the CEE was not the result of a designed agri-environmental policy, but rather the consequence of an evolution from state economy to market economy (Kieft, 1999). Although from the environmental point of view this change is desirable, it inevitably resulted in declined agricultural output. However, the low-input agriculture as it is practised today because of the need for mere survival by a majority of CEE farmers is not truly sustainable. This type of farming too can lead to environmental/nature degradations such as reduction of soil fertility (soil erosion, depletion of soil organic matter, etc.); over (or under) grazing; declining biodiversity; building up of pests and diseases; water pollution by organic manure, fertilisers and pesticides (that are used, although in smaller quantities) (Znaor, 1997). Exceptionally high erosion rates and water pollution in the CEE are best proof of this. The soil erosion affects some 90% of the Croatian farmland, with the soil erosion rates as high as 200 t/ha (UN-ECE, 1999). More than 50% of the Russian and Romanian farmland is subject to various degrees of soil erosion (UNEP, 1997; Znaor, 1999). More than 50% of the total nutrient load to the surface water of the Danube Basin (mainly the CEE countries) derives from agriculture (TG-MWRI, 1997; Haskoning, 1994;. In short, agriculture in the CEE although at a record low or even approaching zero input- is not sustainable either from an economic or environmental point of view.

However, it is interesting to notice that under some circumstances, the practise of low-external input agriculture does not reduce yields proportionally to the reduction of fertiliser and pesticide inputs (Kieft, 1999) (Figure 2). Even with relatively low level of agri-chemical input farmers in the CEE can achieve interesting output level, while at the same time reducing or avoiding environmental damages. Maintaining these output levels, however, requires improved farming practices including balanced nutrient management, improved manure handling, erosion control and crop rotations, based on low input techniques (Kieft, 1999).

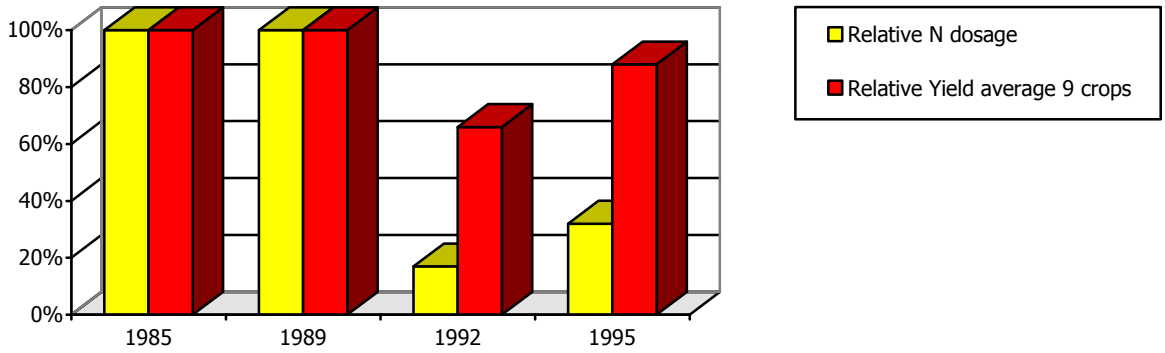

Figure 2: Relative yields and N fertiliser consumption in 1985-1995: averages of 9 major crops in Hungary. Reference year 1985 (after Kieft, 1999).

Current agri-environmental policies in the CEE

The CEE region involves some 20 countries and their agricultural policies are rather diversified. However, ten years after the transition, agricultural policies of most CEE countries are still "at the crossroad" and characterised by a diversity of development visions as well as a diversity of concepts how to implement these visions. The turbulent political climate, with too frequent political changes and replacement of the key policy makers, make it very difficult to set up and consistently implement any mid- or longer term policy. In a number of countries the role of the ministries of agriculture in not yet fully profiled as they still struggle in making a full swing towards serving private farmers instead of the remaining structures of the agricultural co-operatives (Znaor, 2001).

The agri-environmental components of the current agricultural policies either don't exist or are rather vague and underdeveloped. Several countries (e.g. Czech Republic, Hungary, Slovakia, Poland and Slovenia) have started with some forms of support to environmentally friendly farming. Ironically, such support sometimes co-exists with subsidy schemes for agri-chemical inputs (e.g. Hungary). In some CEE countries the farm-level costs of agri-chemicals are maintained at a low level by total or partial tax relief (e.g. Hungary), or by (hidden) subsidies on the commercial product or its manufacturing process (Lukacs and Pavics, 2000; Znaor, 1999).

The official agricultural policy in most CEE countries still aims at restoring agri-chemical inputs to the pre-1990 level (Kieft, 1999) and environmentally friendly agriculture is not seen as a serious policy option (EC, 1998). One of the latest proofs of this is the list of the pilot projects submitted by the EU-applicant countries for the EU-SAPARD support. Only a few agri-environmental projects appear on this priority list (BirdLife, 2000).

Organic agriculture in the CEE: overview

Organic farming offers an interesting contribution in solving the environmental and economic problems both of the EU and the CEE's food and agriculture sector (Alföldi et al, 2000; Gotwald, 1999; FAO, 1997: Znaor 1994). Currently, organic farming has been practised at some 380.000 ha of the CEE's farmland (Table 1.) with a tendency of further growth. As far as the stage of organic agriculture development is concerned, three groups of countries can be distinguished:

1. frontrunner countries, such as the Czech Republic, Hungary, Poland and the Slovak Republic. These countries have relatively large area under organic management and rather developed marketing, inspection, certification, etc.
2. countries with rapidly expanding organic agriculture, such as Estonia, Latvia, Lithuania and Slovenia. The organic sector in these countries is rapidly developing and the supporting institutional structures (regulations, inspection, certification, market, research and education) are being established or further mastered.
3. countries with the emerging organic agriculture. This group includes Albania, Bulgaria, Croatia, Georgia, Moldavia, Romania, Russia, Ukraine, Yugoslavia, etc. The organic production and marketing, as well as regulations, inspection and certification system is still not properly functioning, but is emerging.

Table 1. Area under organic agriculture in the CEE.

Country	Hectares
Albania *	2
Bosnia and Herzegovina *	0
Bulgaria *	150
Croatia *	13
Czech Republic	170.000
Estonia	10.000
Georgia *	350
Hungary	47.000
Latvia	20.000
Lithuania	5.000
Macedonia *	0
Moldavia *	800
Poland	22.000
Romania *	300
Russia	30.000
Slovak Republic	60.000
Slovenia	5.500
Yugoslavia *	120

* some sources refer to a much greater area in these countries, as they also include the area "certified" by some organisations with rather liberal certification scheme.

The value of the CEE organic market is difficult to estimate, as there are no reliable figures available. The value of the total certified organic agriculture goods in the entire CEE might range between 0.8 and 1.2 billion dollars. Some countries such as Hungary, Russia and Slovak Republic produce organic food mainly for export (Hungary > 90%), while the countries such as the Czech Republic and Slovenia produce primarily for the domestic market. Majority of the organic produce at the domestic market is sold in the direct contact with consumers (on-farm sale, market places. etc.) or in specialised shops. In the countries with the emerging organic agriculture, alternative markets channels such as "garages-sale" and vegetarian restaurants also play an important market role. Organic products do attract a premium price at the CEE markets. The premium prices for most of the organic produce in the Czech Republic is 10-20%, Poland 30-50% and Croatia 50-100% higher as compared to the price of the conventional food. However, the supply and demand mechanism is the key rule in determining the magnitude of the premium price. Variable quality, low quantity, limited choice, irregular supply and the lack of the reliable, local certification system are the main obstacles for introducing organic produce into the supermarkets. Health, fashion and ideological reasons, rather than the nature and environment are the driving forces for most organic consumers in the CEE (Znaor, 2001; Znaor, 2000). The typical organic consumers are younger, well-educated people, as well as

the elderly persons with health problems.

The system of inspection and certification is in place in most CEE countries. However the quality and reliability of these systems in the Czech Republic, Hungary, Poland and Lithuania is far ahead other countries, as these countries have IFOAM accredited certifying organisations. The inspection and certification is rather vague and liberal in the countries with the emerging organic agriculture. The volunteers of the local NGOs that have limited manpower, time, expertise and financial means run most of the inspection and certification in these countries.

The authorities of the most CEE countries have already adopted the regulation on organic farming (or this is in procedure). However, these regulation are more the government's respond to the years of pressure from the organic NGOs and own administrative strivings to harmonise their own regulation with that of the EU- rather than a product of the genuine interest in organic agriculture by the CEE policy makers (Znaor, 2000).

The CEE governments' budgets devoted to organic agriculture are meagre. Only Slovenia and the Czech Republic have budgets that are higher than 1 Euro per hectare of the utilisable agricultural area, while the budgets of all other countries are far below this figure (Table 2). A serious political will and commitment to promote organic agriculture is still missing and the support to organic sector in most of the countries is mainly rhetorical. Although many CEE policy makers claim they would support organic farming if they had higher budgets, the reality is often different. Croatia is an excellent example of this practice. Out of nearly 150 subsidies for agricultural production and numerous development programmes run by the Croatian Ministry of Agriculture, none are designated to support organic (or any other type of environmentally friendly) farming (Znaor, 2000)! There is always some money to promote various forms of agriculture, and the support to organic agriculture is a question of priority and strategy rather than the money available.

Table 2. State support to organic agriculture of the selected CEE countries.

Country	Regulation	Direct payment	Estimated OA budget for 2001**	
		(€ per ha)	total €	per ha of UAA
Bulgaria	in procedure	-	0	0,00
Croatia	+	-	135.000	0,05
Czech Republic *	+	30-90	4.600.000	1,10
Estonia	+	25-60	800.000	0,55
Hungary	+	-	600.000	0,10
Macedonia	in procedure	-	0	0,00
Poland *	+	30-130	1.400.000	0,07
Slovenia *	+	186-571	1.200.000	1,50

* The budgets earmarked for 2001 should actually be much higher in order to be sufficient to cover for the direct payments alone. However, the existing official data and resource persons contacted repeatedly indicated the budget amounts used in this table.

** Includes money for the direct payments, inspection and certification, market development, etc.

Environmental and macro-economic impact of large scale-conversion to organic agriculture

Environmental and economic benefits of organic agriculture have been widely documented (; Alföldi, et al, 2000; Znaor, 1999; Gotwald, 1999; BirdLife International, 1997). However, studies exploring the impact of large-scale conversion to organic agriculture of the economies in transition hardly exist. In this respect a study done within the framework of a Phare project on the feasibility of organic agriculture in three Danube countries (Bulgaria, Hungary and Romania) cast an indispensable light on the issue (Znaor, and Kieft, 2000; Wit et al. 1999). The study compared the macro-economic feasibility and environmental effects of large-scale conversion (arable land only) of the two policy options:

- *conventional scenario:* comprising a mix of low-external input regime (ROM 80%, BG 60%, H 29.5%) and high-external input regime (ROM 20%, BG 40%, H 70%), with no land under organic agriculture. agriculture (except H 0.5%)
- *sustainable scenario*: next to low-external input regime (ROM 77.5%, BG 60%, H 20%), and high-external input regime (ROM 2.5%, BG 10%, H 50%), co-existence of some organic agriculture (ROM 10%, BG 10%, H 20%), as well as improved low-external but sustainable input regime (ROM 10%, BG 20%, H 10%).

The results exhibit substantial macro-economic and environmental benefits of the "sustainable scenario". The calculation suggests that the sustainable scenario would result in gross national agricultural production values comparable to those obtained by the conventional scenario (Figure 3). In order to internalise the environmental costs of the two scenarios a shadow price of 1 EURO for each

kilogram of nitrogen leached was applied (note: the methodology of the entire study is described in details in Wit et al. 1999). By charging the shadow price for nitrogen leached, the sustainable scenario showed even greater economic benefit. It resulted in higher net national agricultural production values (Romania 5%; Bulgaria 16% and Hungary 40%) than in the conventional scenario. At the same time, the sustainable scenario resulted in substantially lower nitrogen leaching than that in the conventional scenario: 55% in Romania, 66% in Bulgaria and 82% in Hungary. This nutrient emission reduction complies quite well with the targets set for nutrient reduction for the Danube River and the Black Sea (VITUKI, 1997; Haskoning, 1994). The positive environmental impact of organic agriculture might be even greater if the entire agricultural nitrogen losses were taken into account. This study namely measured only the nitrogen portion lost through leaching (in the case of the three countries concerned it represents only 39% of the total nitrogen losses). Due to the lack of the reliable data, the nitrogen losses through the direct discharge, erosion and run-off were not incorporated into the calculation of this study.

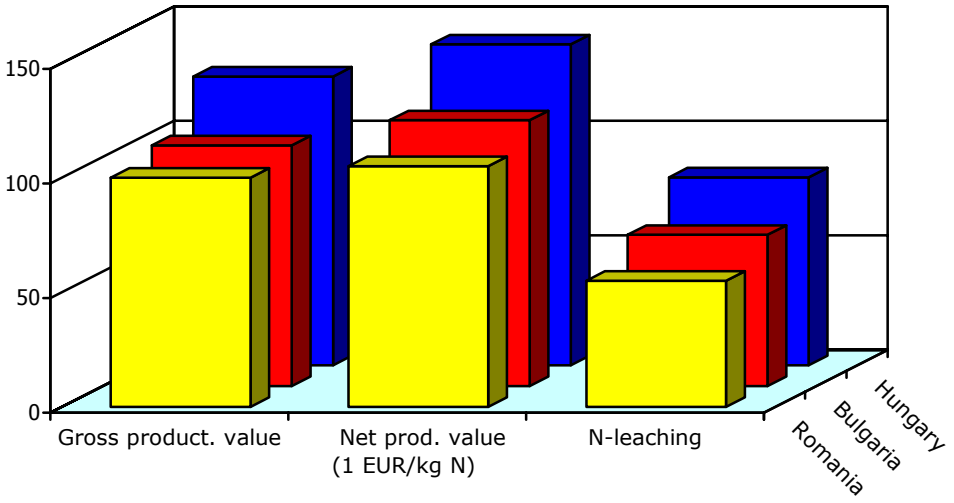

Figure 3. Sustainable scenario: relative figures for gross agricultural production value, net production value (corrected for "shadow" price of €1/kg N leached) and nitrogen leaching as compared to conventional scenario (= 100).

Although the above mentioned results have a rough and indicative value, so far this is the only available calculation on the impact of large scale conversion to organic agriculture in the countries with economies in transition. This study also clearly demonstrates the importace of the internalisation of the external costs. The external costs are those environmental and social impacts that are not reflected in the price of goods and services (European Commission, 1998). Till now environmental, social and other external costs are not fully internalised in the production price. Table 3. shows a potential list of the external costs relevant for assessing the true environmental and macro-economic impact of agriculture.

Table 3. Some types of external costs (Znaor, 1994b).

Type of cost	**Specification**
Social costs	Costs of various subsidies to high-external input agriculture; Public health costs related to pesticide, nitrate, and other types of poisoning; Costs of regulations related to production, transport, trade and use of agri-chemicals; Costs of the implementation and control of the above regulations; Costs of surface and ground water cleaning; Erosion costs (reduced soil fertility, deposition in water bodies, deposits cleaning, etc.); Costs of incidental pollution cleaning; Costs of animal diseases and related disasters
Environmental costs	Costs of endangered and/or lost species, habitat and landscape diversity; Costs of soil pollution and reduced soil fertility; Costs of air pollution; Costs of surface and ground water pollution.
Energy and resource costs	Costs of the use of non-renewable resources (e.g. phosphates) and energy; Costs of storage losses (caused by poor food quality and short shelf-life of the produce).
Miscellaneous	Effect ("costs") related to animal welfare (suffering).

Conclusions and recommendations

The current agricultural practices in Central and Eastern Europe although at a record low input level, are not sustainable neither from an economic nor from an environmental point of view, unless they are accompanied by better management practices, such as organic farming. The CEE's 'forced' experience with low-input agriculture was not the result of a designed policy for agricultural development but the consequence of a socio-political evolution from state economy to market economy. The agricultural policies in a number of CEE countries are still at the "crossroad". They lack agri-environmental component and aim at restoring pre '90 inputs. The policy support to ecological agriculture is declarative, rather than a result of a serious political will and commitment.

The present evidences suggest that organic farming deserves a serious place alongside conventional agriculture. A share of as little as 10-20% of these farming styles in the total agricultural production already exhibits benefits for the national economy and reduces number of environmental degradations (Znaor and Kieft, 2000). The benefits of organic farming are even more pronounced if the external costs of agriculure were internalised.

To enable development of sustainable agriculture in the CEE countries, a 3-track policy is suggested. Its measures should improve environmental and economic performance of the current low-external-input agriculture; promote further development of pioneering organic agriculture, and covert high-external-input regime to integrated agriculture (Kieft, 1999). A mix of these three farming regimes represents a stepping stone for further development of sustainable farming systems in the CEE. Each of the regimes has its strong and weak points, which should be taken into account when setting the policy lines and targets. Table 4. summarises the main performance of ecological, low-input sustainable and integrated agriculture following five criteria (yield, environmental pollution prevention, biodiversity, employment and national income). It has been based on the results of several studies and on-farm research evidences (Kieft, 1999). To facilitate further development of this three-track policy, a mix of policy instruments (regulative, economic, informative, institutional and voluntary) should be put in place.

Table 4. Performance comparison of ecological, low-input sustainable and integrated agriculture (after Kieft, 1999).

Agricultural system/aspect	Ecological agriculture	Low-input sustainable agric. (= improved low input agric)	Integrated agriculture
Yield	++++	++++	+++++
Environment	++++	+++	++
Biodiversity	++++	+++	++
Rural employment	+++++	+++++	++++
National agric income	++++	++++	++++

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