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SECOND EUROPEAN CONFERENCE OF AGRICULTURAL ECONOMISTS

DIJON, SEPTEMBER 1978

EUROPEAN AGRICULTURE IN AN INTEGRATING ECONOMY

NON-TRADE RELATIONS BETWEEN  
EUROPE AND THE THIRD WORLD

by

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NON-TRADE RELATIONS BETWEEN EUROPE AND THE THIRD WORLD

1. The food-gap - a review. Starting point I

The most challenging task for the agricultural scientists is to solve the problem how to match the food production with the food demand in each region and for the low income groups. One of the many sources to consult in this context is the report from the International Food Policy Research Institute in December 1977. It is stated there that the output of staple food crops during the reference period used (1960-75) was rising faster than the population if the group of all developing market economies is considered in the aggregate. There is, however, a large group of food deficit countries and within them the low income group should be particularly considered. In the report the countries with a per capita GNP in 1973 less than US \$300 were denoted as those with low income.

The food shortage does not seem to change in the near future. In connection with staple crops the projected *production* growth rate for the period of 1975-1990 is 2.4% in the low income, food deficit group. The cereal production dominates among the staple crops and historically the average annual growth rate for all cereals showed that figure during 1960-75. In terms of area the growth rate then was 0.9% while the figure was 1.4% for output per hectare. It seems as if the intensification becomes gradually more important since the figures for the latter part of the period (1967-75) change to 0.7% and 1.5% respectively (according to the research institute).

The production growth rate projected here can then be compared with the required one according to the calculations of the Institute if the *consumption* need in 1990 should be met. The following alternatives are formulated in this context:

If 1975 per capita level is used	3.0%
With low income growth	3.7%
With high income growth	3.9%
At 110% of energy requirement (without regard to market demands)	4.4%

The food crisis in the group under observation is quite obvious from these figures. In absolute terms, the food deficit in the low income, food deficit countries is projected to rise according to the research institute quoted from 12 million metric tons in 1975 to 70-85 million by 1990. The target of the World Food Council of 10 million metric tons per year will be necessary and probably insufficient in the next decade to come. Also the number of persons concerned is considerable. The group of countries discussed have almost 2/3 of the total population of the developing market economies. Almost 75% of the population in this group of countries live in Asia, for instance India, Bangladesh and Indonesia.

There are several lessons to be learned from this review of the food gap.

1. Commercial *imports* are not relevant in the low income country group under discussion with exception of some few countries, such as those exporting oil (Nigeria, Indonesia). The research institute estimates the amount of foreign exchange required for the projected deficit to be about US \$14-17 billion at 1975 import prices. It has been calculated that the increase in import costs for the developing countries during the peak price period in the 70's due to oil, fertilizers etc. roughly corresponded to the total official aid to these countries (Lundahl 1977). Instead of commercial import food aid will have to continue during the period covered as an emergency measure.
2. One important strategy will have to be to stimulate *agricultural production*. Large investments will have to be made and the training facilities to be increased. It has been estimated in connection with the World Food Conference in 1974 that the annual investment volume in the agricultural sector of the developing countries would have to increase from about 9 billion US \$ to about 17 billion US \$ if the annual growth in production should increase from 2.6% to 3.4%. The transfer of financial resources and relevant technology seems to be a necessity. A summary of the experiences from countries with rapid production growth would be an interesting way of approaching this problem.
3. Still one important strategy will have to be to increase the *income* and effective demands of the poor. In the short run different food programs might be applied but the long run problem is to create employment opportunities. ILO has shown that the poorest half of the world population only gets 7% of the world income.

## 2. Towards a new international order. Starting point II.

With the food gap in mind there is no wonder that the Third World requires a reshaping of the international order. Even if the origin of formulating new international relations started much earlier - such as the Lusaka conference of non-aligned countries in 1970 - the intensity of the debate increased around 1974. Two events that year contributed to his development: The World Food Conference and the Sixth Special Session of the U.N. General Assembly.

The Food Conference in Rome was partly a consequence of the pressure from the 77-group and caused by the famine in the South of Sahara and in South East Asia, by the increased prices of grain, and by the reduced storage. Some specific measures were taken, such as

- 1) the establishment of World Food Council as a coordinating and supervising institution,
- 2) the continued food aid is taken care of by the World Food Programme where an emergency supply of 500 000 tons of grain was suggested,
- 3) a storage plan should be further discussed within the framework of World Food Security,
- 4) a resolution of improved nutrition was accepted, and nutrition programmes should be formulated.

The U.N. General Assembly was initiated by Algeria and supported by the developing countries. The problems to be considered were related to the overall topic of raw materials and development. A Declaration on the Establishment of a New International Economic Order was formulated along with an Action Programme (U.N. General Assembly Resolutions 3201 (S-VI) and 3202 (S-VI) May 1, 1974.) Among the strategy principles mentioned were the nationalization of the raw materials, the elimination of the debt burden in foreign trade, a fair relationship between the prices of goods from the developing and the developed countries respectively, the transfer of technology, and the cooperation between the raw material producing countries. This discussion was followed up within the framework of the Seventh session of the U.N. General Assembly one year later. In terms of food it might be particularly observed that adjustment of the production in the developed countries is especially mentioned. There is, consequently, a challenge to the European agricultural economists to analyze how such an adjustment is to be interpreted. One attempt will be carried out in the next section. In addition to this adjustment problem the supply to the Third World of stable and sufficient amounts of fertilizers at reasonable prices also can be mentioned as an important part of the requests.

Several interesting research projects have been stimulated by the debate on the international order. It all started already in 1972 with the publication by the Club of Rome on the Limits of Growth. The report was carried out in the Massachusetts Institute of Technology and it was based on a dynamic system model of the world. Four major trends were analysed: the industrialization, the population growth, the food per capita and the pollution. The report emphasized the scarcity of raw material which leads to very high prices of all goods - the food as well as the industrial products. These ideas were very much criticized. Instead of recommending a non-growth model other important issues could be raised. How should the resources for development be spent? How do we choose between different consumption patterns?

Due to the debate created by the Club of Rome several additional research projects were directly or indirectly initiated. One example is the Bariloche-model on the future of mankind. In this Latin American model the intention is that the viewpoints of the developing countries should be particularly observed. Instead of analyzing development trends the focus is on the meeting of basic needs and the period required to reach the fulfilment of these needs. The indicator of welfare is the average length of life - not the GNP. In contrast to the "Limits of Growth" the limited natural resources are not restrictive as such. In food production the balance of Asia raises problems but the potentialities of other areas cover the Asian demand. It is stated that for instance Latin America only utilizes 17% of the potential arable land area and Africa 28% of its potential. Instead of analyzing the finiteness of the resources the distribution of these resources should be observed as well as the international division of labour.

Another example of the debate created by the Club of Rome is the report published in 1976 with the title of RIO - Reshaping the International Order with J. Tinbergen as coordinator. The idea in this project is to study what kind of new international order should be recommended to meet the urgent needs of the present population as well as those of the future generations? The basic message in the chapter of food production is the need of an increase of self-sufficiency in the Third World. Among measures towards that goal collective self-reliance and land reforms are mentioned. The requests on the developed world in this matter are of two kinds. One request is to *transfer* relevant technology as well as fertilizers at reasonable prices to the developing countries. Another request is to change the *consumption* pattern in the rich world.

A final example of research work in connection with the international order can be given from MOIRA - Model of International Relation in Agriculture. In contrast to the other studies the food production is the main topic. The possibilities of reducing famine is illustrated with the two main strategies:

1. A redistribution of available resources through reduced consumption in the rich world and through distribution via international institutions.
2. Increased food production in the Third World through the regulation of the world market, the liberalization of trade, and increased income to the agricultural sector.

A reduced consumption in the rich world does not per se improve the food situation of the poor. But *if* the "released" food products is taken care of through international trade institutions and *if* the food aid is strictly directed to the poor people the famine could be extinguished. It is estimated that 0.6% of the national income of the rich countries would be needed each year during 1975-2010 for a food redistribution.

The different resolutions taken in official declarations or in non-governmental statements as well as the different research projects mentioned should give sufficient basis to explore - at least in a tentative way - the adjustment possibilities within European agriculture. The emphasis will have to be put on the production and consumption pattern in the rich countries as well as the transfer of resources from these countries.

### 3. Adjustment possibilities within the agricultural system of a European country

In Sweden we have made an attempt to illustrate these problems for our agriculture. The first step has been to describe the *production system* from these viewpoints. We have expressed the volumes in energy terms (kcal) to use comparable measures. The flow of import with regard to food, forage, fuel, and fertilizers (particularly nitrogen) is traced through the plant production which delivers its products either to the animal production, direct consumption, export, or waste. :

We found that the import we needed as input into the system was completely dominated by nitrogen fertilizers and fuel in that order. The plant production delivers about 2/3 of the volume into animal system where these products completely dominate as inputs. Imported protein forage is only 9% of the total forage input. The output of the animal system is, however, modest. It supplies only 33% of the consumption volume in energy terms and only 3% of the export. Imported food is 8% of the consumption and thus 60% of it is supplied from the plant production. Within the animal system milk and milk products dominate and supply 21% of energy consumption. 66% of the total animal production are needed to reach such a result and nearly half of the total forage input in the animal sector where half of this input in its turn consists of domestically grown coarse grain. So, the question immediately is raised - is such a production system in *agreement with the new international order?*

We have tried to formulate the imposed demand on Swedish agriculture in the following alternative ways:

1. A change in the *output* of the system. The *food consumption* can be considered concerning the energy input/output ratio as well as nutrition. The following figures have been used in kg per person and year for consumption change. (Näringsforskning nr 2 1976):

Cereals	+12
Leguminous plants	+2.5
Potatoes	+5
Root crops	+2
Eggs	-6
Broiler	-2
Beef	-3
Ham	-14

2. A change of the *output* can also occur with respect to the *export volume* of grain, mainly wheat. The idea will then be to utilize all available arable land to maximize the food production at least within the planning horizon until 1990 according to section 1 in this paper. Parts of Sweden have comparable advantages in grain production and in an export alternative the production costs should not be restrictive. 1.6 Mtons of grain should then be permanently offered for aid or export during the period considered.

3. A reduction of the *imported inputs* into the system. The *nitrogen fertilizers* are limited to 50% of the amount to-day and the effects can be studied both with and without the export volume discussed above. In certain areas of Sweden there might be ecological restrictions which have been exceeded even to-day. In general, a reduction of the nitrogen input is probably not causing the same proportional decrease in yield. The price of imported *protein forage* is raised in our calculations by four times the present price. Instead we are trying to increase the use of domestically produced forage. In pork production garbage could cover 3% of the total forage need and more domestically grown beans can be used. Part of the soja meal imported can be reduced in favour of rape-meal. The largest part of the waste in the production system is straw and a larger part than to-day can be used as forage after further preparation. There is finally a forage reserve in the unutilized pasture.

The reduction of some imported inputs agrees with the demand for resource transfer. The basic hypothesis here is that the resource use in the developed world has a greater effect on the resource availability than the population increase in the Third World. The same hypothesis applies in the consumption change.

4. *Within* the system the use of land and labour are of particular interest. The land utilization has already been observed in the export alternative. Also the full utilization of our labour must be considered. The basic principle in connection with labour must be that the global adjustment of Swedish agriculture should not create an increased *regional imbalance* in Sweden than to-day. It is important to avoid that the economically weaker sectors of the developed economy mainly pay the costs for the development in the Third World. For this reason the alternative value of the present labour force is regarded to be low. In order to create an access of labour in our calculations the social costs have been limited to half of the present costs.

The calculations of these alternatives have been carried out with linear programming. The restrictions are mainly of biological character but some regional ones are also formulated. New technique is expected to be applied in 1985. A projection of the production to-day until 1985 has been carried out. All the calculations according to the four points above are compared with this projected alternative, the basic one. The results might be summarized in the following way: (table 1).



Table 1. Change in production means at different alternatives of adjustments in the Swedish agricultural production system with respect to global demands.

Input	Base	Consumption alternative	Export alternative	Nitrogen reduction		Price increase imp. forage	Labour costs reduced	Combination <sup>x</sup> % change
				without export	with export			
Protein forage, cattle, 1000 tons	180	180	177	183	167	110	161	+8
Protein forage, hogs and poultry, 1000 tons	290	140	290	162	258	290	290	-44
Rape meal, 1000 tons	14	5	14	12	28	48	17	+93
Feed mixture, calves, 1000 tons	42	38	42	38	54	41	42	+14
Labour, million hours	113	106	117	101	111	117	119	-5
Traction power, million hours	34	35	38	32	35	37	40	+3
Nitrogen fertilizers, 1000 tons	192	186	217	<span style="border: 1px solid black; padding: 2px;">110</span> <sup>xx</sup>	<span style="border: 1px solid black; padding: 2px;">110</span> <sup>xx</sup>	220	218	-43
Arable land, 1000 ha	2 530	2 460	2 710	1 830	2 630	2 590	2 810	-2
Pasture, 1000 ha	45	43	45	58	72	45	45	+62
Total costs, billion cr.	10.3	8.9	10.3	9.0	11.7	11.9	8.2	-

x reduced nitrogen input, increased domestic forage, abundant supply of labour, change of consumption and grain export of 700 000 tons.

xx given quantities in the calculations are put within a frame. Source: Not yet published data by G.Forsberg.

A change in the *consumption pattern* according to point 1 means the lowest production costs and release of arable land from forage purposes, to be put into export crops and to a certain degree into domestic beans. Meat can be produced only as a by-product to the milk production.

The *export* alternative does not fully utilize all land resources which are estimated to 2.9 million hectares. This alternative draws heavily on such production means as labour, traction power, and nitrogen fertilizers.

A *nitrogen* reduction without combination with export causes the export of grain to be completely stopped. The production costs are of the same order as the consumption alternative. Imported forage crops for hogs are reduced and instead domestic beans are used. The arable land area is reduced due to the lack of export. Instead the pasture is more utilized. With the export of 700 000 tons of grain included the utilization of land is of course increased and the pasture area reaches its maximum. The production costs are increased even for other products than grain. The marginal costs is 120 cr per kg nitrogen input to be compared with 10 cr per kg in the non-export case.

An increased domestic *forage input* shows the highest production costs. This alternative requires high inputs of labour and nitrogen.

Availability of *labour* favours also high utilization of land resources and to a certain extent also the use of domestic forage.

The *combination* of all these measures is shown in the last column in table 1 with the % change in comparison to the predicted base alternative in 1985. A Swedish agricultural system in agreement with the new international order might then be characterized by 1) low nitrogen utilization, 2) high domestic forage production, 3) no restriction of labour force, 4) change of food consumption towards more cereals, and 5) grain export volume of 700 000 tons. The total costs (calculated without full compensation to the labour force) are low due to the consumption change. The consumption change releases land and labour resources which instead are put into export crops, domestic forage crops and as compensation to the nitrogen reduction. This reduction along with the increased labour supply makes it profitable to utilize pasture. This reduction also seems to stimulate the use of domestic beans for hogs rather than the increased price of imported protein forage. On the other hand, this price increase seems to have stimulated an increase of the share of rape meal in the forage to hogs and poultry. Further on, some regional effects can be demonstrated. The Southern part will increase its position as a centre of refinement of agricultural products as milk and beef while the forage production is increasing in the Northern part. Grain and pork will be produced partly in the intermediate parts. It is quite possible that this interregional pattern is repeated also *within* some regions where there are similar intraregional differences.

#### 4. Transfer of resources and food production in the Third World

In principle the transfer of resources is dealing with food aid, financial means, inputs, particularly fertilizers and seeds, and technology. There is no scope for bringing up all these demanding problems in one paper. Only some few aspects can be stressed.

*Food aid* is solely an emergency measure. The basic idea among the developing countries is to reach a self-support as rapidly as possible. The status to-day is that in India and Bangladesh the food deficit was 1% and 7% respectively of the consumption need in 1975. The corresponding figure for the Sahel group is 9%. (International Food Policy Research Institute). There is at least one observation to be made in this context. The food aid has to be distributed to specific target groups in order to fulfil its objectives. If so, the internal market in the receiving country might not be disturbed. In principle the producer prices have to be stable and relatively high to stimulate food production within the country. Thus, there is a certain risk that food aid has a negative effect on the overall food-balance within the country.

*Financial means* are of course of great importance in connection with land reclamation, irrigation, fertilizer plants, employment creation etc. It has been estimated that foreign capital contributed to 1/10 of the growth of the developing countries (Radetski 1976). Both investments, loans and gifts are included. The difficulty here is again as with the food aid not to orientate the development of the receiving country in disagreement with the national goals. Vaitos (1975) points out that the term "foreign investment" is a misnomer. A more accurate term would be "foreign controlled investments or firms". Also the criteria to estimate the profitability of an investment might be misleading. Often aid-giving countries identify specific projects for their investments. Particularly such projects are selected where quantitative data on the costs and benefits exist. As Johnston and Kilby (1975) have pointed out this "encourages a partial view of the options available. The result is undue reliance on a narrow concept of efficiency, a tendency to exaggerate the returns to be realized from concentrating resources in "bankable projects", and neglect of measures needed to achieve an efficient expansion path for the agricultural sector" (p.130).

*Fertilizers* in the Third World are mainly used for cash crops but if extended to food crops a rapid way for increased production is found. About 15-20% of the world's production of fertilizers are used among the developing countries. Only 20% of the farmers are estimated to utilize them. (Parpia 1977). Africa shows low figures while Asia demonstrates some increases due to the green revolution. In Latin America there are relatively large quantities but mainly on commercial farms (World food supply and demand 1976). The effect of increased fertilization is, however, quite dependant on the water supply. Thus, humid soils give the highest response. To solve the long run problems and to decrease the dependence on very unstable world market prices (such as during 1972-73) investments in fertilizer plants in the Third World will have to take place. This is not a simple operation, however. Johnston and Kilby (1975) summarize the difficulties in the following way: "Stated in the most general terms, large differences in investment cost per unit of capacity reflect the fact that the organization and construction of fertilizer plants is itself a complex production process", (p.344).

The *technology* aspect raises a whole series of questions on the capital-labour ratio and the choice of intermediate technology. The general ambition is to create employment and to reduce the capital input as long as it creates a debt burden. Exceptions from that rule will of course occur, such as in the case of investment in fertilizer plants since that production is extremely capital-intensive. The case of fertilization is often discussed

in connection with choice of technology. Another example is offered by the genetic engineering in the leading food crops, rice and wheat, to meet environmental conditions in the tropics and in this case contribute both to production and greater labour absorption. In connection with mechanical processes Johnston and Kilby point out in a penetrating analysis two different approaches: despecialization and labour-addition.

By despecialization they mean the use of an earlier, more labour-using production method. One example would be second-hand machinery but adjusted to modern conditions in the tropics. The crucial problem here is if the disadvantage of a less specialized process is compensated by the labour wage rate and the employment effect. Labour-addition instead means adding labour to recent equipment and in such a way increasing the output. One example would be to introduce multiple shift operation. In the first case less expensive capital is used and in the latter case the amount of labour is increased. Much more research is needed around the problem of intermediate technology.

##### 5. The challenge to the agricultural economists

This presentation is based on the conviction that the present and expected food gap in the world completely overrules other problems to be brought up in agricultural economics research - regardless of where the research worker happens to be located. One aspect of this problem is the *economic structure* of the international relations. Another aspect is the *adjustment* of the production system in the rich world to facilitate a closing of the gap. A third aspect is the *transfer* of resources from the rich part to the poor part of the world. The last aspect of this problem will be the concepts and the *theoretical framework* used in analyzing the problems of food production and employment creation. Perhaps we will have to start already there. Some few remarks will be given also on this last point.

An illustration is given by Parmar (1975). When we are dealing with famine there is a need of formulating a food gap. But in the stage when the basic requirements within the country concerned are fulfilled in terms of food, health, education etc. the question rises if there is a point then to formulated income gaps. Parmar mentions the "catching-up" fallacy which focuses on the so-called need to reduce the gap between the North and the South. "As long as a country's effort is an improvement on its previous best, as long as quantitative increase in output correct maldistribution, and as long policies of development generate people's participation, it is immaterial whether there is a widening or a narrowing of international gaps" Parmar says (p.13).

Another example given by Parmar is the capital output ratio. It implies the procurement of capital required to initiate the desired rate of growth. Since domestic savings are insufficient the conception means the seeking of foreign investment and assistance. It was already mentioned earlier that our investment criteria in the Third World should be reconsidered completely.

It might even be that the very stress on the relations between Europe and the Third World in this paper is causing conceptual difficulties. Parmar focuses his paper on the growing awareness in the developed countries on "global interdependence". As a contrast the major concern among the developing countries is "self-reliant development". The most crucial question

then evidently must be the one Parmar raises in the following way:  
...."if the goals of "interdependence" and "self-reliant development"  
should prove to be opposed to each other, the prospects of international  
cooperation would indeed be bleak" (p.3). So, let us start to explore the  
implications of this interdependence - now!

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