PLENARY PAPERS

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RESOURCE ADJUSTMENT AND EUROPEAN AGRICULTURE

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Jerzy Wilkin

Warsaw University

"The Induced Innovation Model of Agricultural Development and the Socialist Economic System"

Most of the socialist countries are facing now the necessity of radical economic reforms which would significantly change not only their economy but also the character of a socialist state. Main goal of such reforms are the increase of efficiency of the economy and greater participation of individuals and social groups in the decision-making process. The indispensability of joining economic reforms with the democratization of political life is one of the lessons learnt by socialist countries also from their own experiences.

Substantial, though different in scope and character, economic reforms have been introduced in Yugoslavia, Hungary, China, Poland and other socialist countries. It is not easy to forsee what model of socialism will result from these reforms.

The common features of current reforms in the socialist countries are: the growing role of market forces in shaping the economic structures; the decentralization of planning and management; the increase of significance of economic criteria (such as efficiency and profitability) in the production decision-making; the activation of money in the economy; the expanded possibility for private initiative in economic activities.

The experiences stemming from functioning of the socialist economic system for many years have created new arguments and proofs for the debate on the possibility of rational economy under socialism. I think that now more and more economists from socialist countries are ready to accept some of the arguments presented by L. von Mises and F. A. Hayek in the discussion described as "Socialist Controversy" in the 1920's and 1930's. According to them the lack of market mechanisms which would determine prices and serve as a corrier of information is the most important

obstacle for rational allocation and effective utilization of resources.

A complete replacement of the mechanism based on "invisible hand" of markets by "perfectly visible hand" of the central planner proved to be not only uneffective but also not fully posible. A tendency now prevailing in the socialist countries is to preserve some functions of the central planning while expanding and activating market forces in regulating vast fields of the national economy.

Agriculture has always played a very important role in stimulating economic reforms in the socialist countries. I would like to stress here the role of agriculture in the process of introducing noncollective forms of ownership, activation of money and markets and utilization of nonconventional incentive systems. The influence of needs and problems of agriculture on economic reforms was visible particularly in China, Hungary and Poland. A similar influence can now be seen in the Soviet Union.

Poor agricultural performance of the socialist countries in the 1970's resulted not only from some mistakes in agricultural policy but also from weaknesses of the agricultural system itself.

In the 1970's socialist countries became as a group the net importer of agricultural products. The average rate of growth of agricultural production in th socialist countries in the 1970's and in 1980's was lower than the world average rate of growth. If we consider the level of production in the priod of 1969-1971 as 100, the index of world agricultural production in 1980 was 124, and 140 in 1985, while for the socialist countries these indices were 117 and 131 consecutively. 1/ In 1971-1981 the net imports of grain by the European socialist countries rose by 590 %. 2/ Only Hungary was a substantial net exporter of agricultural products during this time period. The growth of agricultural-foodstuff imports by a number of the socialist countries / especially Poland / played a major role in increasing debt burdens, a tendency which cannot be continued.

Poor agricultural performance of socialist countries cannot be explained by unsufficient increase of investment in agriculture. In 1970-1984 the share

of agriculture in the fixed capital formation of the whole economy rose in all socialist countries, except Bulgaria and Rumania. The share of agriculture in the fixed capital formation in the European socialist countries is, on the average, 2-3 times higher than in Western Europe. However, the share of agriculture in GNP is also much higher in socialist countries than in highly industrialized capitalist countries.

In the 1970's and in the 1980's the fertilizer use rose considerably in the socialist countries, exceeding in some of them /GDR, Czechoslovakia, Hungary / the average use of fertilizers per hectare in Western Europe. The increasing use of fertilizers was accompanied by the decrease of fertilizer productivity. In the time period between 1970-1974 and 198-1984 both the Soviet Union and East European countries enjoyed the increase of grain production by 8,8 million tons, which made 2 % of the world grain production increase during that time. During the same period socialist countries increased the fertilizer use by 10,7 million tons, which constituted 25 % of the world increase of fertilizer use. 3/

In the second half of the 1970's European socialist countries faced stagnation or decrease of the combined factor productivity. At the same time in many socialist countries there occured temporarily or permanently shortages of some groups of agricultural products. The situation in agriculture in Eastern Europe was worsened by the world oil crisis and the growing balance of payment problems.

The agriculture and the whole national economy of the socialist countries were confronted with a challenge which required many significant, qualitative changes in their general economic systems.

Historically, agriculture in socialist countries has been quite successful in mobilizing productive resources for a relatively rapid growth of agriculture and for the development of the whole economy. The economic system established in the intial period of the socialist industrialization preferred the extensive methods of economic growth which resulted in the extremally high share of investment in GNP and a very big demand for labor force. The exhaustion of some resour-

ces / land and labor / and rapid increase of costs of others made it impossible to continue the extensive methods of economic growth. Symptoms of that situation were: slowing economic growth, stagnation or even decrease of national income / Poland / in the late 70's, and in the beginning of 80's.

The main problem socialist economies are faced with now is how to increase significantly the productivity of resources. The extremally high energy use per unit of GNP in the socialist countries is the example of low productivity of resources. In 1983 Hungary used more than 5 times more energy per unit of GNP than Sweden or France. The rates for the Soviet Union and Poland were 3,7 and 3,1, consecutively.[4/]

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Agricultural problems in the socialist countries are determined mainly by their general economic system. That system has shown a considerable success in mobilizing and concentrating the resources, but has been much less successful in their effective use. The causes of this relatively low efficiency are complex. Here are only some of them, especially important for the formation of efficiency of agricultural production.

1. In the structure of indices assigned by central planning authority, indices related to the quantity of production dominated over the criteria related to quality and efficiency of production;

2. The prices of products, especially prices of inputs, have reflected neither costs of production nor supply and demand. Thus they have not served as correct information for the allocation of resources;

3. Nonprice information could not compensate deficiencies of price information , and as a result, the process of allocation was deprived of the objective criteria neccessary for the correct distribution and effective utilization of resources;

4. The financial system, described by J. Kornai as "the soft budget constrain", and the passive role of money have led to the permanent surplus of demand over supply and shortages of consumption and production goods;

5. Nearly complete elimination of capital market / replaced by the administrative rationing/ resulted in the lack of selfregulating mechanism for allocation of factors of production from the enterprises and branches with low productivity to the units with higher productivity;

6. Organizational structures and pricing system caused costs, prices and the structure of output in the national economy, abstracted from the world market situation. This limited benefits flowing from the international division of labor and from foreign trade;

7. Organizational structures and the size of productive units in the socialist economy were determined to a greater extent by the idea of central management of the economy, than by changes in the structure of resources, costs of production, or by the tendencies of technical progress. Organizational structures were changed frequently as a result of the decisions made by central authorities. The average concentration ratio in the socialist economies is higher than in the industrialized capitalist economies;

8. One of the important reasons of relatively low efficiency of resource use in socialist countries is inadequate functioning of incentive system. Cumulation of decision-making power on the central or high level of administration, and the lack of clear and strong ties between the worker's income and the economic results of production as well as frequently huge sizes of productive units led to the phenomenon called "alienation of property". In the consciousness of the workers, big state or cooperative enterprieses appeared as production units with absentee owners. In the history of socialist agriculture there are many examples showing how the reforms of incentive system could improve the productivity of resources used in agriculture. Let me mention only some of them: NEP - period in the Soviet Union; reforms of Polish agriculture in 1956 and 1980; economic reform in Hungary in 1968, and the introduction of "the production responsibility system in China in 1979;

9. Insufficient growth of the food-stuffs production in some socialist countries

is caused, among other things, by the inconsistency within the food production sector of the national economy. The lack of the necessary transportation equipment, too small storage or processing capacity frequently led to the waste or underutilization of agricultural products.

Most of the agricultural problems of the socialist countries cannot be solved without the reform of the whole of their economic system. Different kinds of reforms have been introduced in most of the socialist economies but they are implemented with "the trial and error procedure". Unfortunately there is no paradigm in the socialist economic theory, which, like J. M. Keynes theory in the 1930's, could form the base for the reforms of economic system and economic policy.

My inquires into the nature and symptoms of the contemporary agrarian questions in different economic systems led me to the conclusion that the basis for modern agriculture and prerequisite of success in its development is a smoothly and efficiently operating adjustment mechanism.[5] Through the continuous adaptive changes of production structures and production technologies, being a reaction to the changes in demands and possibilities made by technological progress, agriculture can fully utilize resources and development possibilities existing not only in agriculture, but also in the national economy, and to some extent, in the world economy. The limited efficiency of adjustment mechanism of socialist agriculture, determined by the socialist economic system, has become a serious impediment of development not only of agriculture, but also of the whole national economy. The research recently conducted by agricultural economists show the deterioration of static and dynamic efficiency of agricultural production in socialist countries as a group.

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Searching for some models helpful for evaluation and improvement of socialist agriculture I thought it could be interesting and useful to confront the current agricultural problems and developments in the socialist agriculture with

one of the most interesting models of agricultural development, called "The Induced Innovation Model", a paradigm presented by Y. Hayami and V. W. Ruttan in their book: Agricultural Development. An International Perspective. 6/

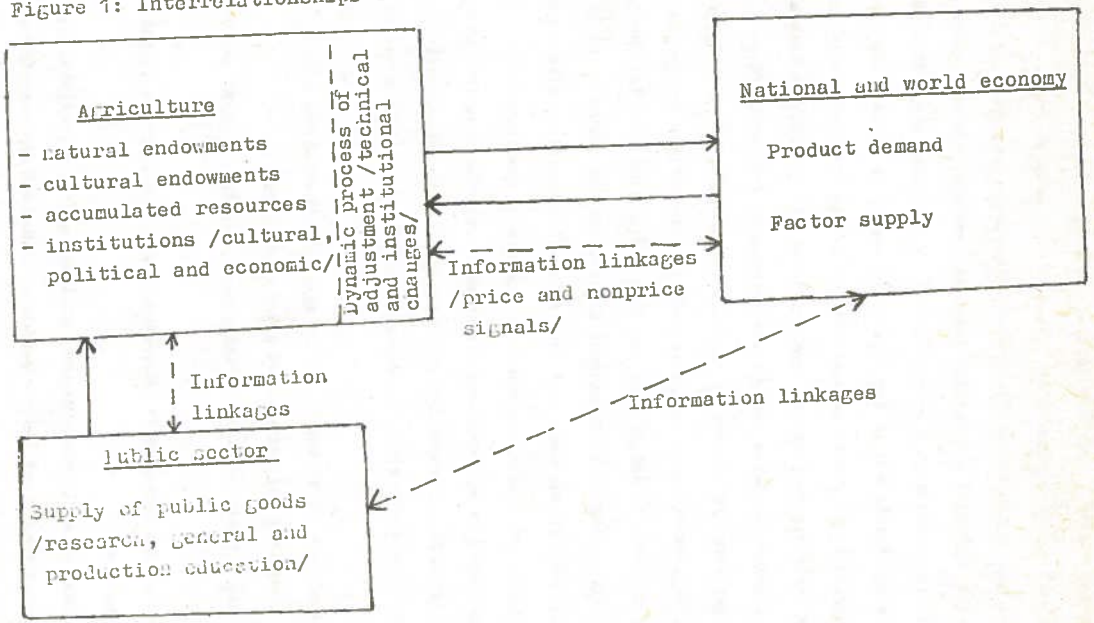
Hayami and Ruttan wrote: "The model attempts to make more explicit the process by which technical and institutional changes are induced through the responses of farmers, agribusiness enterpreneures, scientists, and public administrators to resource endowments and to the supply and demand of factors and products". 7/ They see agricultural growth as a process of easing the constraints on production imposed by inelastic supplies of land and labor. In the Induced Innovation Model, technical and institutional changes are treated as endogenous factors. They hypothesize "that technical change is guided along an efficient path by price signals in the market provided that the prices efficiently reflect changes in the demand and supply of products and factors and that exists effective interaction among farmers, public research institutions, and private agricultural supply firms." 8/ An important part of the model are institutional innovations like: changes in property rights and changes in market and nonmarket institutions.

The main goal of agricultural development could be described as a rapid growth in agricultural productivity through generating "an ecologically adapted and economically viable agricultural technology in each country and development region." 9/

Efficient process of adjustment in agriculture requires:

- smoothly operating and undistorted price mechanism;
- well developed public sector supplying new knowledge, general and profesional education;
- industrial sector permanently generating new more productive technical inputs for agriculture;
- incentive system mobilizing farmers, administrators, scientists, and educators for continous search and implementation of technical and institutional innovations.

Figure 1: Interrelationships between main elements of the Induced Innovation Model



It is not clear how Hayami and Ruttan see the incentive system as a part of the Induced Innovation Model. There are only very few remarks on this subject in their book, while, in my opinion, it is a very crucial point for the success of agricultural development. Profit maximization or personal income maximization cannot explain behavior of farmers in many agricultural systems, even in highly developed countries.

A very important part of the model is price mechanism. In this model prices are treated as a principal type of signals on supply, demands, and resource scarcities. "Our analysis suggests that were price relationships have been distorted, either through market imperfections or government intervention in market process, both the innovative behavior and production behavior of private firms and public institutions have been distorted. /.../ In most developing economies the market systems remain relatively underdeveloped. A major challenge facing these countries in their planning is the development of a well-articulated market system capable of accurately reflecting the effects of changes in supply, demand, and production relationships."[10]

The Induced Innovation Model tested on time-series data for the United States and Japan shows how countries with so different resource and cultural endowments could achieve tremendous success in agricultural growth through the development of properly adjusted institutions and appropiate technologies.

The Induced Innovation Model of agricultural development cannot be adopted directly to the reality of socialist agriculture. It is a model designed for the market economy. I see the relevance of the Induced Innovation Model for socialist agriculture in the general pattern of the adjustment mechanism in agriculture developed in the model which is oriented into the efficient use of available resources for the fulfilment of demands for agricultural products. An open question is how to implement this pattern to the economic system of the centrally planned economy or the socialist market economy.

In 1938 a distinquish Polish economist Oskar Lange published a book "On the Economic Theory of Socialism", in which he presented a model of rational allo-

cation of resources in socialist economy.[11] Lange's book was a response to some critics of the socialist economy / L. Mises, F. E. Hayek, L. Robbins/ who rejected the possibility of rational resource allocation and correct economic calculation in the economy based on collective ownership. The model presented by Lange was an important and a very well received attempt to establish a paradigm of socialist economic system. However, Lange's model has never been fully implemented in any socialist economy. It was inconsistent with some basic institutional arragments existing in socialist countries.

Now we do not have a paradigm which could be regarded as a theoretical pattern for economic reforms in socialist countries. Instead, there is a tendency in these countries to introduce or reintroduce some institutions and mechanisms belonging to the common inheritance of the world economic development. Reconciliation of such categories as rationality, efficiency, profitability, innovation, competitiveness etc. in many socialist economies led to significant modifications in their structures and mechanisms.

In the early years of socialism in Eastern Europe there was a political pressure to uniform agricultural systems in all socialist countries. Full uniformity has never been attained. Since the 1960's we have seen growing differentiation of agricultural systems in these countries.

Historically, agriculture was the part of socialist economy where some untypical solutions were tolerated: extensive private ownership of land and productive capital in Poland and Yugoslavia, small quasi-private auxiliary plots in the countries with collectivized agriculture, relatively free market for some groups of agricultural products, and so on. Recently, many important changes in the socialist economic system were also introduced in agriculture. Below, I shall present examples of some developments in agriculture in relation to the main elements of socialist economic system.

I. Decision-making structure.

- Tendency into decentralization of planning and management of production units in agriculture;
- Growing popularity of selfmanagement in cooperative and state farms;

- Introduction of "the production responsibility system" based on brigade or family units.

2. Mechanism for information and coordination.

- Planning remains the most important mechanism for information and coordination in countries where agriculture was collectivized, however, with the decentralization of planning and management and the growing role of self-financing and profitability in enterprises, market mechanism is gaining new importance;
- There is a gradual shift from administrative methods of directing agricultural production units to economic tools /such as taxes, credits, prices etc./;
- Improvements in cooperation between research institutions, experimental and extension service stations, and productive units in agriculture.

3. Property rights.

- Decollectivization of agriculture in China;
- Constitutionalization of the individual's permanent right to own land and introduction of the principle of equal treatment for all three sectors / private, state, and cooperative/ in the Polish agriculture;
- Restoration of some traditional cooperative rules in collective farms /Hungary/.

4. Incentive system.

- A tendency to introduce income-parity for people employed in agriculture in relation to the average income in the national economy;
- Equalization of social benefits between state and cooperative sector as well as between agriculture and industry;
- The growing role of profits in formation of personal incomes of agricultural workers and in determining investment funds of agricultural enterprises;
- Greater participation of state and cooperative farm workers in management;
- Improvements in rural infrastructure necessary for providing communal, educational, educational, cultural, and medical services.

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Step by step, almost in all socialist countries, agricultural systems are becoming more and more compatible with the model described by Y. Hayami and

V. Ruttan as " the Induced Innovation Model". Differences between these systems and the model are still big, but directions of reform movement in socialist countries seem rather clear. The negligence of some important economic criteria under socialism / like: effectiveness and profitability / and the expansion of agricultural protectionism in Western capitalist countries contributed to the reduction of benefits which could be available from natural and accumulated resources, both in the East and in the West.

Agricultural problems in capitalist countries are different from those in socialist countries but categories and methodology used for analysis of these problems are becoming very similar. Therefore it is a need for cooperation between agricultural economists from the West and the East in solving the problems facing agricultural economics and agricultural policy.

Notes

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3. State of the World 1987. A Worldwatch Institute Report on Progress Toward a Sustainable Society, New York, Oxford University Press, 1987, p.141
4. W.U. Chandler, The Changing Role of the Market in National Economies, Worldwatch Paper 72, September 1986, p.18
5. Jerzy Wilkin, Wspolczesna kwestia agrarna / The Contemporary Agrarian Question/ Warszawa, Panstwowe Wydawnictwo Naukowe, 1986
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7. Ibid., p. 4
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IO. Ibid., pp. 441, 442

II. Oskar Lange, On the Economic Theory of Socialism, Minneapolis, The University of Minnesota Press, 1938