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Transition of agricultural research in Latvia

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ABSTRACT

Transition reforms in Latvia after the restoration of independence in 1990 are leading to essential changes in the agricultural sector, which has experienced drastic decreases in the productivity. At the same time agriculture as a part of rural community has good environmental, social preconditions for economic development in a sustainable way based on research and extension. The reforms of Latvian research and education are under progress according to the new conditions and needs of agricultural development. An essential role in these processes has been international co-operation. Agricultural research and education will successfully contribute to the development of farming by further improvement of its institutions and management to provide actual research directions and introducing diverse education/advising activities to farmers.

Key words: agriculture, research, education.

Introduction

The transition from socialist to private agriculture has created a new situation in agricultural research and education. Individual farmers, instead of the narrowly specialised collective and state farm employees have become the main producers and users of knowledge. Investigations (T.Tisenkopfs, A.Zobena, 1999) prove that the new farmers often lack the necessary knowledge and skills: former employees of collective farm have mainly narrow specialisation and about one third of new landowners have no agricultural education and experience.

Farming in the market system requires new knowledge and attitudes. Firstly it is economics and management of private ownership, which is completely new as compared with the previous practice. Secondly, transfer and implementation of advanced technologies and machinery. Thirdly, protection and maintain of natural resources as the basis of agricultural activities. Finally, agriculture should be perceived as a part of rural community development.

The objective of research is to supply agricultural sector with the know-how. The science sector in the general transition processes was cardinally changed institutionally, organizationally and thematically. The same processes were carried out in the educational sector - from vocational schools to the university. The farmers advisory service was developed.

An important role is played by international co-operation. Until the end of 1980's the Soviet Union was isolated from the Western countries. After the regaining of independence in Latvia it was necessary to find new contacts and develop co-operation. Transition processes in post-socialist countries succeeded thanks to the large interest and willingness to offer help from the Western countries. Successful development and movement to the European Union are results of international co-operation.

This paper reports on agricultural research and educational transition performed in Latvia.

Agricultural situation in Latvia

The agricultural sector in Latvia like in other Central and Eastern European countries (since 1990) is characterized by essential and diverse processes of transition. By means of liberalization, privatization and restructuring of the agricultural sectors, elements of the market economy have been introduced by building up new institutional frameworks that change political, economical and social conditions.

In the ten year period the Latvian state policy has been developing towards the market system but economy and social life are only at the beginning of the "market way". Rapid decrease was observed in all branches of economy. Agriculture and forestry are parts of the rural infrastructure and their development can be seen as an integral part of the whole rural development.

Climatic conditions and soils of Latvia are very suitable to high harvesting and an economically effective cultivation of agricultural lands. The potential of agricultural production is, at a minimum, two times higher than self-supply needs. Latvia is also known for its high biological and landscape diversity unique in Europe.

Agriculture and forestry are important sectors in the national economy, although their share in national production have been reducing from 21,3% in 1991 to 7,3% in 1998 (MoA, 1999). Forestry products are the main export item in Latvia, taking up 38% from total exported produce in 1999 (MoE, 1999).

15,3% of the whole labour force in Latvia (data of 1997) are employed in agriculture, which is much lower than in Poland (26,7%), Romania (37,3%), Bulgaria (23,4%) or Lithuania (24,0%). In comparison with the EU countries (average 5,3%) Latvia is in the second position after Greece (MoA, 2000).

Labour productivity in the agricultural sector is too low. Measured by the added value per person employed in agriculture it is less than 10% of the level in the EU countries. Out-dated machinery, old technologies, insufficient knowledge, small-scale farming - are the main cause of this.

From 1990 to 1999 the total herd has been reduced by almost 65% and the current trends show further reductions. Latvia today has a dual purpose to its agricultural production: for market and self-supply - (practiced by a larger part of Latvian farmers). In 1998, farms with 1-5 heads of livestock contained 70% of all dairy cows and 30% of pigs (CSBL, 1998).

The production volume of crops has also been reduced considerably due to the planted area reductions. The productivity levels have stayed low, e.g. in 1998 the average grain productivity was 2,0 t per ha, which is one-third the level in EU countries (MoA, 1999). The demand for the crop produce was affected by unstable market and reductions in animal production. Today more than 15% of agricultural land or near 400 000ha are not cultivated.

Forests currently account for almost half of the land area (46%) in Latvia and it is expected that over the next few years the forest areas could be extended. There are 1,7ha of forest per capita in Latvia, what is 8 times more than the average in Europe (MoA, 2000). Approximately 50-60 thousand people are employed in forestry, mainly from the rural population. Forests are the most valuable property of rural people, for about 50% of Latvian forests are in private hands, the number of owners being approx. 155 000.s.

The impact of agriculture on the environment since 1990 has decreased (Buđmanis P., 1999), but negative effects still remain: soil-nutrient depletion, acidification of soils, soil erosion and compaction; water - nutrient leaching, surface pollution, waste water; air - emissions of NH₃, CH₄, CO₂; biodiversity and landscape - pollution, destruction, unused agricultural land etc.

Today agricultural production is influenced by insufficient amount of investments, percentage of small farms, lack of farmers' experience in management and insufficient education. In the present situation welfare of the rural population to a great extent depends on the development of

agriculture, which is still at an early stage. The proportion of aged inhabitants in rural areas is high and this prevents the improvement of economic and social life in rural areas.

On the other hand, the low workforce costs and rich natural resources positively characterize the production potential of agriculture. Financial aid from the government and the EU could improve living conditions of rural population. It could develop agricultural production, improve the quality of processed products. Besides that, support could facilitate development of alternative activities in rural areas, reduce unemployment and increase the income.

Solutions will be underpinned by research activities in agriculture as an essential part of sustainable rural development. The results of this research should provide the basis for legislation development, economical support, education and advising activities. Research and education play the decisive role in the development of agriculture under the new conditions.

Heritage of science and higher education

After the formation of an Independent Republic of Latvia, the University of Latvia was established in 1919 on the foundations of the Riga Polytechnical Institute, where agricultural studies had started in 1863. The Faculty of Agriculture was opened. At this time also research work in agriculture and forestry was commenced. These were areas most likely to give direct benefits to Latvia. The level of agricultural production, reached by the first independence, up to 1940, was comparable with the leading countries in Europe.

After World War II, science in Latvia developed concurrently with the science under control of the Soviet Union's governmental and administrative bodies. The five agricultural research institutes with a wide network of experimental plant and livestock breeding stations were functioning under authority of the Ministry of Agriculture.

Science of the Soviet period (1940-1990) can be characterized as follows (LAS, 1999):

- separation of high level research from universities;
- strictly limited international contacts which lead to international isolation;
- orientation to the development of technologies serving for the Soviet military complex;
- centralized planning and financing of research;
- science as means for scoring political and ideological points;
- monopoly of the Russian language as the working and publication language.

The highly centralized and extensively developed research system of the Soviet period had little value for Latvia itself. The collapse of political and economical system of the Soviet Union at the end of the 1980's created an opportunity to reform Latvian science and higher education.

The reforms of higher education and research

The education and research policy implemented in Latvia after regaining independence has been determined to a great extent by the conditions of the transition period of the state. The radical changes in politics, economy and culture have created a totally new environment. The current legislation on education and science was developed. The National Concepts of Higher Education (1998) and National Concept of Research Development (1998) were formulated and set up the following priorities:

- **Integration of national research potential into Universities.** The major task was to carry out integration and incorporation of individual state research institutes and their staff into universities, with the primary aim to modernize and strengthening the research capacity of these universities.
- **Creation of Research Centers of National significance.**

- **Research priorities.** The Cabinet of Ministers (1997) nominated the following as areas of National Research Priorities: information technology, material sciences, forestry and wood sciences, organic chemistry, bio-medicine and pharmacy, Lettonica. One of the priorities in cooperation with EU is ecology and nature environment in which agriculture will play an important role. The following directions are relevant for sustainable development of Latvia: forestry and agriculture research, social and economic research, energy technologies.
- **Renewal of the academic staff.** At present the average Latvian researcher is more than 56 years old - such a situation cannot ensure a complete progress and advancement of Latvian higher education and research. More than 30% of all academic staff are at the retiring age. The low level of salaries interrupt the continuity of academic personnel.
- **Financing.** Higher education and research have separate financing systems. Higher education mainly is financed from the state budget - about 1% from GDP. After 1991 considerable changes in the funding of research have been implemented. The research institutes do not receive more basic funding. The government expenditure for research today constitutes only 0,25% of GDP, which is about 55% of the total research financing (LAS, 1999). Financing from the private sector, especially agriculture, is not essential.

Organization of Agricultural Research, Education and Extension

Agricultural science and higher education is a part of common Latvian system, having its own specifics. Traditionally the Ministry of Agriculture is responsible for agricultural research and education. Under the authority of the Ministry are the Latvia University of Agriculture, two research institutes, state experimental and breeding stations, agricultural secondary schools (technicums) and vocational schools, Latvian Agricultural Advisory Service (LAAS), etc.

The Latvian Academy of Agriculture and Forestry Sciences (LLMZA) was founded in 1992 as an association of the most prominent scientists in the related fields of these sciences. The Academy has functions of an expert and advisory body to the Government, the Ministry of Agriculture and other institutions in the field of agricultural, forestry and food sciences. Objectives of the LLMZA:

- co-ordinate scientific research;
- integrate the work of scientists from higher educational establishments and institutions of scientific research in order to promote academic studies and scientific research;
- develop new generation of scientists;
- international co-operation (Nordic Countries, Baltic States, Russia, Europe);
- co-operation with the Latvian Academy of Sciences, ministries and leading enterprises.

The Latvia University of Agriculture (LLU). Higher agricultural education in Latvia started to develop in the middle of the previous century in the Riga Polytechnical Institute. The Academy of Agriculture as an independent higher education institution was primarily established on the basis of the Faculty of Agriculture and Forestry of the Latvia University in 1939. The Academy was renamed the Latvia University of Agriculture in 1991.

LLU today provides education, research, extension and continuing studies in agriculture, food industry and forestry. LLU is the only higher agricultural education establishment in Latvia. Today LLU comprises 7 faculties, 2 institutes, 3 training farms and a forestry training centre.. The total number of teaching staff is about 400, including 170 Doctor of Sciences. The total number of students exceeds 7500. LLU provides undergraduate, graduate and postgraduate studies in 18 specialities. The Faculties of the Latvia University of Agriculture are the following: Agriculture, Economics, Agriculture Engineering, Veterinary Medicine, Rural Engineering, Food Technology and Forestry.

The reform of higher education in Latvia and LLU was started in 1990 (Busmanis P. 1994, 1995). Special emphasis was paid to the development of the unity of research and education at

the University. The process of integration was implemented together with 4 State research institutes:

- Institute of Agriculture “Agra”;
- Institute of Animal Husbandry and Veterinary Science “Sigra”;
- Institute of Agricultural Engineering and Energetics;
- Institute of Agricultural Polymers and Water Management.

The process of formal integration between LLU and state research institutes was carried out at the beginning of 1998 and today they are Research Centres of the relevant faculties. A complete functional integration is still a matter of time and subjected to financial and managerial stimuli.

Aspects of integration include:

- participation of researchers at all levels of higher education;
- competitive appointment of academic personnel;
- restructuring of faculties;
- reassessment of accreditation criteria for study programmes.

Latvian State Institute of Agrarian Economics and Latvian Forestry Research Institute “Silava” continue to work as separate institutions, but their scientists cooperate with LLU.

International co-operation. The strategy of higher education and research reforms in Latvia are closely connected with international ties, which are being steadily and purposefully expanded in order to get joined to the international academic community. Essential is the support received from international partners, especially the European Union. This helps with the reform of the education and research systems and to sustain development. At the same time, the character of co-operation is changing (*Table 1*).

Table 1. Development of international co-operation in Latvia

Factors	Period	
	1990-2000	From 2000
Aim	To promote transition process	To secure development
Main objectives	Transfer of knowledge and experience	Exchange of knowledge and experience
Character	Help	Co-operation
Financing	External	Bilateral

International co-operation of agricultural higher education and research was started in 1991. In 1992 the Danish Research Council undertook the evaluation of the Latvian research including agriculture (DRC, 1992).

The reform strategy in LLU as the main branch institution is closely linked with the development of international co-operation - because one of LLU’s main tasks is to join the international education system, as well as to solve problems of agricultural and forestry development in a shorter time. Benefits for LLU from international co-operation, in general, will be the increase and assurance of the quality of higher education and research. The co-operation forms are the diverse: bilateral agreements, participation in the EU and regional programs, entering international organisations, individual contacts etc.

Vocational and secondary agricultural education in Latvia historically has been well developed already since the end of 19th century. Today there are 22 agricultural vocational schools and 16 secondary vocational schools (technicums), covering the whole territory of state (MoA, 1999). These education institutes are undergoing a serious process of transformations: the

necessity for agricultural specialists has decreased. Today less than 50% of all students are in the programmes connected with agriculture and forestry. The process of reorganisation will affect also agricultural vocational and secondary education - profile of specialities are changing according to the new situation, smaller schools will be closed, but the more successful technicums will become colleges.

The network of agricultural schools plays an important role not only in the formal vocational education, but also in the dissemination of knowledge between farmers - organising short time courses, demonstrations, field days etc.

Latvian Agricultural Advisory Service

All countries, where agriculture is based on private farming, have agricultural advisory/extension services of various types (Rivera W.M., 1991). The idea of national agricultural advisory service was started simultaneously with the agrarian reform and with the emergence of private family farms. The two possibilities were investigated: advisory service as an independent organisation (Danish model) or as a part of LLU, like American extension system. The preference was given to the first variant. The Latvian Agricultural Advisory Service (LAAS) was developed in close co-operation with the Danish Agricultural Advisory Centre. Similar advisory systems were developed in another two Baltic states - considerable importance in setting up LAAS belongs to the assistance from programmes of the European Union, Denmark, Great Britain, Sweden and other Western countries. The LAAS at the beginning was established as a state institution. The organisational development of the advisory service has been taking place all throughout the country. Presently it covers all the 26 administrative districts of Latvia and has involved in its regular extension activities about half of all farmers. LAAS was restructured in 1997 as a non-profit enterprise, with 99% of share capital subscribed by the Ministry of Agriculture and 1% by the Latvian Farmers Federation.

LAAS was established as a state-financed organisation. The Ministry of Agriculture set the objective to become 50% self-financed, which actually achieved 25% in 1998. Further increases in self - development partly depend on LAAS activities and the economical development of agriculture.

The objectives of LAAS's close co-operation with agricultural education and research institutes are (MoA, 1999):

- to provide consultation in agricultural production, marketing and processing;
- to promote farmers' education;
- to enhance the link between agriculture science and farmers.

Important achievement in the previous period has been specifying the advisory directions and development of advisory farms. Currently there are three main directions of agricultural consultations:

- economics and farm accountancy,
- animal husbandry and veterinary medicine;
- plant production.

Consultations of a smaller scope are provided in the areas of mechanisation, house-keeping, rural tourism, environmental protection and construction. The actual task is to help farmers to use the practical possibilities for the rural sector in Latvia to benefit from the transitional period prior to a full membership of the European Union.

The scope of the provided advice forms are diverse. It includes group undertakings (lectures, seminars, training etc.), individual consultations, field days etc. From 1996 LAAS has developed field demonstrations and research trials as an important information-dissemination tool, and establishing a research-extension linkage. The LAAS plays an important role to ensure more efficient links between agricultural scientists, advisers and farmers.

Example of international co-operation: Central and Eastern Europe Sustainable Agriculture (CEESA) Network

The new agricultural and environmental situation in the Central and Eastern European (CEE) countries reveal the necessity of new political and institutional solutions which are compatible with the idea of sustainability. Numerous environmental damages are described, many of them being caused by the agricultural sector.

The Humboldt University of Berlin (prof. K.Hagedorn) in 1998 took the initiative in organising the Central and Eastern Europe Sustainable Agriculture (CEESA) Network. CEESA is a network of 12 CEE countries (Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia and Ukraine) and the EU countries with both research and information functions which serves as a forum for the exchange of views, knowledge and results on sustainable agricultural development (SAD) among academics from the EU and CEE countries, as well authorities of the CEE Region. Essential support to CEESA activities is given by the FAO Subregional office for Central and Eastern Europe.

At workshops held at Gödöllő in March 1999 and Bucharest in November 1999 the participants agreed that research should be divided into three main thematic priorities:

- **Institutions of sustainability.** Both transformation of agriculture and transformation towards sustainability have to be considered as issues of institutional change. Research in this field mainly focuses on the impact of changes in economic institutions of agriculture (property rights on land), on the emergence of economic institutions of the ecosystems (property rights on nature) and on the analysis of the necessary “governance structures”.
- **Agri-environmental policies.** Crucial questions are whether or not governments pay sufficient attention to the necessity of agri-environmental policies, whether there is a discrepancy between existing legal regulations and their implementation by the administrative units, and whether EU enlargement may result in a transfer of institutions and instruments.
- **Sustainable farming systems.** Research activities related to the farm level focus on a concept of sustainability which integrates economic, ecological and social aspects. CEESA gives priority to environmental issues (without neglecting the other ones) as these are usually underrepresented.

The materials of the CEESA First Workshop with 11 country reports of the present environmental situation in agriculture are published (FAO, 1999). Studies on the agro-environmental situation in the CEE countries revealed necessity for more rigorous research in this area.

The proposal of an international research project “Sustainable Agriculture in Central and Eastern Europe” was prepared by Humboldt University of Berlin and submitted to 5th Framework Programme of the European Commission. The research Group comprises researchers from Humboldt University of Berlin, University of Helsinki, Wageningen Agricultural University, University of Newcastle upon Tyne and FAO Subregional Office for Central and Eastern Europe in Budapest. The Group co-operates with individual researchers of twelve CEE countries and organises multi-disciplinary and transitional research on the subject of SAD. Main attention is devoted to the question whether there are opportunities to link the two necessary processes of change, i.e. transition of the agricultural sectors and transition towards sustainable economic activities in these countries.

The expected outcome of the project is the elaboration of a set of recommendations for country specific approaches to sustainable development of the agricultural sectors and policy measures to

be included in agricultural policies of each country. These recommendations will be presented at a Conference in 2002 and discussed with decision makers from the CEE countries.

Rural and Agricultural Policy

The agricultural policies in Baltic countries: Estonia, Latvia and Lithuania are influenced by three dominant strategies: liberal, protectionist and sustainable (Tisenkopfs T., 1999). The liberal strategy is oriented towards the promoting of specialised, intensive type of forms and copy the Western agricultural scenarios of previous decades. The protectionist strategy is oriented towards promoting of small agricultural farms, which were traditional in Latvia before 1940. Its policy is problematic from the perspective of compatible farming and integration with the EU. The strategy of sustainable agriculture currently emerges in Latvia. It aims to balance the social and environmental goals in agriculture. The sustainability approach and policy will be dominant in Latvian agriculture.

The relationship between agricultural and rural policies in Latvia is placing more emphasis on rural development. The Rural Development Program of Latvia (MoEPRD, 1998) was elaborated to create preconditions for integrated, multiform and sustainable rural development. This document specifies long term development objectives for the rural sector:

- development of agriculture, forestry and fishery;
- facilitation of entrepreneurship in rural areas;
- rural diversification;
- protection of environment and maintenance of rural heritage;
- improvement of infrastructure;
- development of education system and cultural aspects.

The main objective of the Latvian agricultural sector is to achieve an efficient agricultural protection, enabling integration into the European Common Market. As sub-objectives the following can be mentioned:

- to provide the population with high quality domestically produced food;
- to ensure a competitive income level for people employed in agriculture;
- to preserve the countryside and utilise natural resources rationally.

Promotion of agriculture through research and education

During the last decade after the renovation of an independent Latvian state the agricultural research and education had essentially reformed. For a successful further development to fulfil policy objectives it is necessary:

- to establish closer links between research, extension and agricultural industry, promoting transfer of new knowledge and technologies;
- to follow development issues according to future perspectives and needs of agriculture;
- to give high priority to international contracts and co-operation;
- to continue research and education integration processes;
- to master the knowledge by foreign languages as a "key" to the world;
- to update the scientific and teaching equipment, computer systems and libraries;
- to find different ways for increasing funding of research and extension;
- to recruit young researchers and teachers as a precondition for a successful development of research and education.

The links in the chain from research - extension - farming has to be closer and more effective. They will be promoted by:

- research with applied orientation in actual agricultural fields;
- involving researchers and teaching staff in education and advising of farmers in close co-operation with LAAS;

- co-operation between research, extension and industry for the transfer of know-how to farmers;
- developing demonstration and monitoring activities.

The previous agricultural research mainly addressed the technological and technical aspects, without paying the necessary attention to effectiveness and management. Today the research should precede political, economical and social changes. These processes in transition countries are going through radical changes and more rapidly than in countries with stabilised economy today. The dynamics of research goals are shown in *Fig.1*.

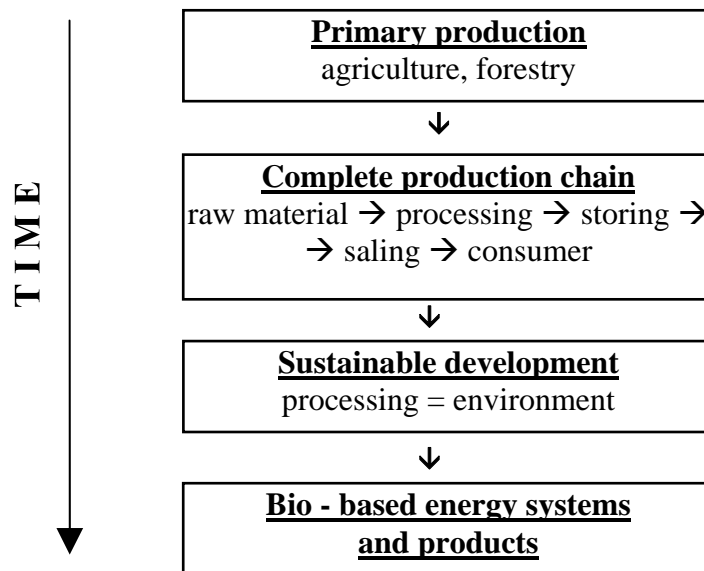


Fig.1. Dynamics of research objectives.

The general objectives of research in sustainable agricultural development are effective economy in long lasting and healthy society with respect to agricultural production and conservation of natural resources. The main fields of agricultural research accepted in Latvia are:

- Production of high quality food and increase of agricultural productivity
- Development of rural infra-structure and promotion a high life standard in rural areas
- Development of alternatives for new productions and services in countryside
- Securing of animal health and welfare
- Production of renewable energy bio-resources
- Reduction of nutrient tosses from agriculture and protection of water resources;
- Maintenance and protection of rural landscapes and biodiversity.

Agricultural education could be viewed as one of the fundamentals of the agrarian sector, especially in the transition period.

Individual private sector farming is completely different from collective farming and needs new approach to agricultural education (Table 2.). Successful development of farming in Latvia needs wide education and advising network which would allow to transfer results of research to practise. The knowledge will include the following:

- Understanding of the action and elements of the market system. Thinking will need to be reoriented because the former central planning and command system oppressed farmer's activities and self-initiative.
- Understanding of on-going processes, including transition from traditional farming and living style to a new situation in countryside, where the number of people employed directly in agricultural farming will decrease and they will have to find alternative activities.

- The world experience and real situation in Latvia aim to address new issues by focusing on : sustainable agriculture, food quality and security, environment conservation, protection and restoration, development of renewable energy resources etc.

Table 2.

Changes of agricultural education in the process of transition

<i>Centrally planning economy</i>	<i>Market economy</i>
Narrow specialisation of professional knowledge in collective farms.	Wide knowledge allowing entrepreneurial individual farming.
Knowledge based on centrally planned research.	Transition and investigation of world know-how under local conditions, according to the demand.
Knowledge partly separated from the production process and belonging to the groups of collective farm specialists.	Equal distribution of knowledge among farmers.
Links between agricultural specialists and workers in collective farms as mechanism of knowledge implementation.	Independent farming activities of individuals with necessary knowledge.
Centralised education system determined by directives.	Education system based on demand for and supply of knowledge.

Conclusions

- The agricultural sector of Latvia in its transition processes has essentially decreased, but it has good preconditions to be developed as a part of rural community in sustainable way.
- The reforms of Latvian research and education system, including establishing of Agriculture Advisory Service, are running according to the needs of agricultural development.
- An essential role in agricultural restructuring is being played by international co-operation in research and extension.
- Rural and agricultural policy of Latvia has set out long-term development objectives fulfilment of which could be succeeded by renovating research and extension institutions.
- Agricultural research and education will successfully contribute to the development of farming by further improvement of its institutions and management which are at the head of practice with actual research directions and introducing diverse education/advising activities of farmers.

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