

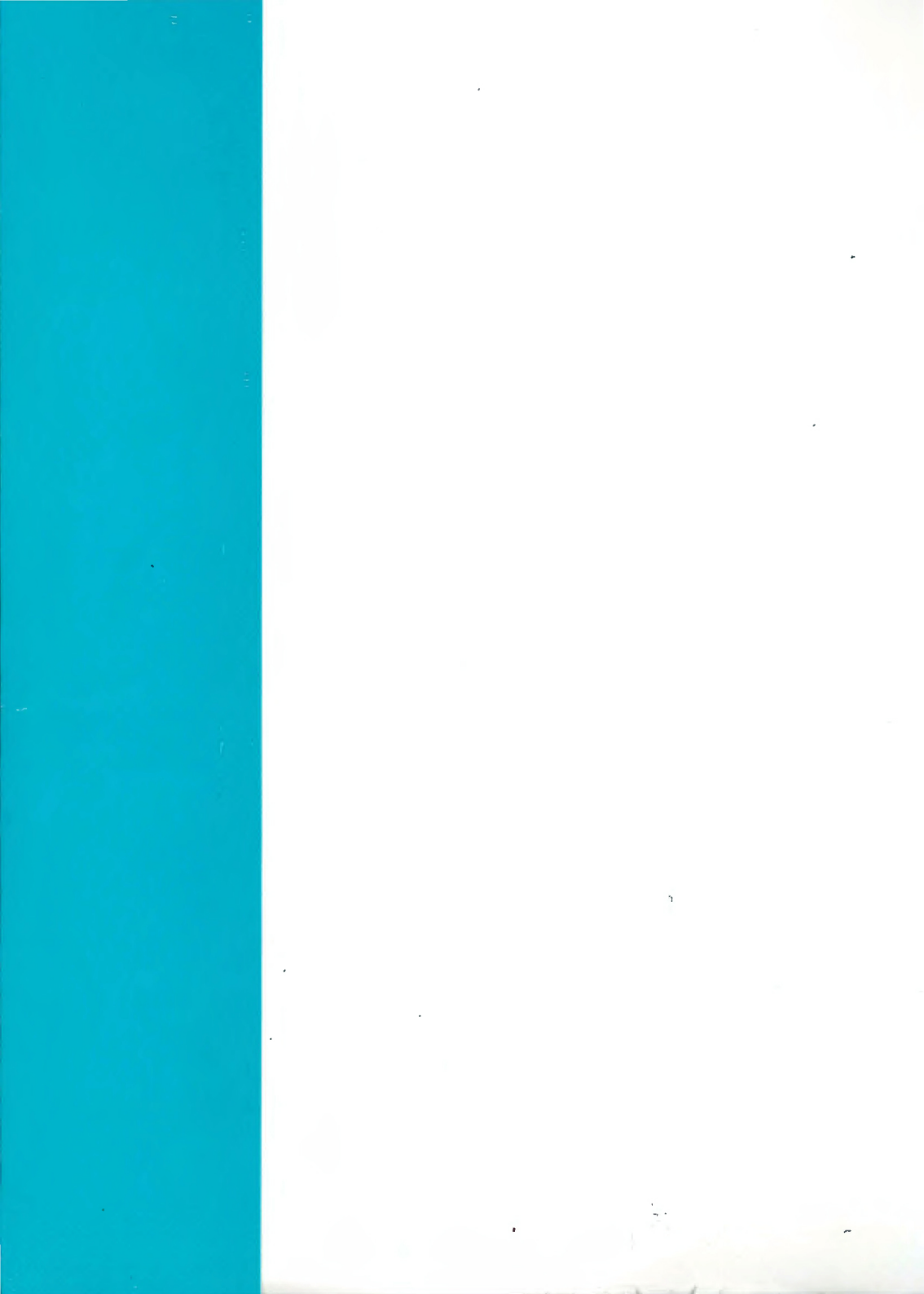
**POLISH ACADEMY OF SCIENCES
SYSTEMS RESEARCH INSTITUTE**

**STRATEGIC
REGIONAL
POLICY**

**A. STRASZAK AND J.W. OWSIŃSKI
EDITORS**

PART I

WARSAW 1985



SYSTEMS RESEARCH INSTITUTE
POLISH ACADEMY OF SCIENCES

STRATEGIC REGIONAL POLICY

Paradigms, Methods, Issues and Case Studies

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editors

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PART I

Warsaw 1985

II. REGIONAL POLICIES
IN A SYSTEMS CONTEXT

FROM RETEOSPECTIVE TO PROSPECTIVE CASE STUDIES
REDESIGNING REGIONAL DEVELOPMENT: SOME STRATEGIC ISSUES

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1. Why New IIASA Regional Development Case Studies?

Almost from the beginning of IIASA, the region, being a specific socio-economico-ecotechno system has been considered as an object of international East-West studies. Two research groups, one from the management and technology area, another from the regional development field have worked together for about ten years.

Therefore, when Professor Andrei Kochetkov proposed a new IIASA study on Strategic Regional Policy and consideration of the region through the company's behavior - especially the strategic one, me and my colleagues from the Warsaw Systems Research Institute advised him to reestablish the international East-West team of scientists for joint examination of the new regional development issues.

Why systems analysts, researches from the management and technology area were and are still interested in regional development and regional modelling?

First, management of development remains an increasingly important subject of investigation since future economic growth will be more complex and difficult than that of the past. Unfortunately, knowledge in the field of management of development is limited. Application of new techniques, computers and models for regional development is less advanced than in, for example, business organisations.

Thus, management of development is still a major management problem.

There is a great diversity of development areas and each development task has its own characteristics and problem - solving criteria.

Fulfilment of current and future needs of societies requires improved utilization of all local as well as external resources such as minerals, energy, land, water, air, capital, labour, education, management, organization, information, knowledge, intelligence and technology.

Development of regions is and will be even more a key factor in national development as well as in the world-wide development.

The increase in geographic density of economic and social activities makes the socio-economic and geographical spaces more coupled than ever. Moreover, specialization of these activities reached over huge areas of geographical space and resulting interdependences cut even across national boundaries. For example in Tennessee (partly within the reach of the Tennessee Valley Authority region - the IASA first regional development case study) recently two Japanese companies have established two successful plants, one - to build cars and second - to make tires.

The success that these two Japanese companies have had in this region impressed General Motors, and location for the new GM Saturn project has been chosen within this region, not far from the Japanese plants.

The Saturn project consists in application of the most advanced technology for car building in order to erase the cost advantage that the Japanese enjoy on small cars.

Rapid geographical expansion of more and more diverse economic and social activities causes an increase of sectoral productivity, at the same time producing geographical, economic and social inequalities and as the result, an increase the areas of low productivity throughout the global geographical space.

Productivity is the source of all economic value and all resources can be managed for productivity, however, if competitiveness of the region within the region - company framework (as proposed by A. Kochetkov) becomes the key issue then such resources as education, knowledge, intelligence and technology play the crucial role. The concept of "Technopolis" elaborated in Japan is a goal example for that.

Competitiveness is not a theoretical construct, it is a real-life problem, it is rather strategic policy than operational construct, and therefore case studies approach is not only appropriate but necessary for thus oriented systems analysis.

Competitiveness is a strategic issue which has emerged recently almost everywhere, in the West and the East, and therefore the goal of reestablishing the international East-West-team of scientists for joint examination of the new regional development issues within the framework of the IIASA Regional Task is most welcome.

All of us know current IIASA constraints as well as new opportunities. One of these new opportunities is to use our experience and knowledge from previous IIASA regional development studies for the new one, using as much as possible the collaborative scheme of research. Many of us, participants of this workshop took active role in the previous IIASA activities. We are trying to involve even more scientists into our research, some of them promised to participate in the future workshops and other activities. Since, however many of us did not participate in the IIASA research, it will be appropriate to present to you shortly the main lessons from the previous IIASA research in this field.

2. Lessons From IIASA Regional Development Case Studies

IIASA's regional development research began with the study of the Tennessee Valley Authority (TVA) which is one of the largest regional projects undertaken in the USA. In the 1930's, when the TVA project began, there was no mention of systems analysis and models.

The need for regional systems analysis and models arose later and ten years ago there were already several important applications within the TVA. The TVA models ranged from overall national and regional econometric projecting devices through more precise sectional planning applications done to operational optimisation. New models are probably now being worked out, and also linkages of the old ones are being improved.

However, we should stress at the beginning that systems analysis and models are just auxiliary devices for supporting the regional development operational or strategic policies. Moreover, TVA's capacity of providing management for complex development of the region was and still is quite limited, and its contents has altered during the course of time. Nevertheless, we could say that the grand strategy for this region (in the broader sense) has been established and implemented. This strategy was and is: to attract industry through:

- availability of relatively cheap electric power (the result of the TVA's activity),
- availability of resevoirs (TVA's activity),
- availability of cheap water transport (TVA's activity),
- availability of relatively cheap manpower and greater diligence among the employees,
- availability of recreation resources which attract skilled specialists (TVA's activity),
- relatively low taxation and other stimulating measures.

Competitiveness of the Tennessee region has been proved practical again in 1985, when General Motors after consideration of some 100 locations, by using a specific list of requirements that the site of the new Saturn plant must meet, decided to go to Tennessee.

IIASA's second case study, which was completed in 1977 was the Bratsk-Ilimsk Territorial Production Complex (BITPC) in Siberia near Lake Baikal. The BITPC is the precessor of many other regional development programs in the USSR, especially in Siberia.

Territorial Production Complex, a long-term planning construct is based on the use of a large number of models and if we look at both the Bratsk and TVA regional models we can see some similar areas of concern, but of course the way the systems analysis and models are utilised differs significantly.

The driving force for the TVA and the BITPC programs was utilization of water and mineral resources for future industrial development.

Both development programs have achieved outstanding success in technical advances. In the TVA the main technical advances

have been made in electric power generation, flood control, fertilizer production as well as in new agricultural techniques.

The Bratsk-Ilimsk experience has led to new technical advances in the construction of industrial complexes such as the world's largest aluminium plant, huge timber complex, hydroelectric power stations and electric power generators.

The third IIASA case study, the Shinkansen program was not based on utilization of natural resources (water, mineral and so on) but on a more advanced, more abstract concept, namely - shrinking of the geographical distance in term of time by utilization of new transport technology.

The Shinkansen project led to implementation of the peek developments in railroad passenger transport technology. Research and development efforts played an important role within these regional development programs, however, creativity in a region as prerequisite for the development of new products and production processes was not a crucial one. Saturn project has been designed outside Tennessee as well as electrical generators, and the aluminium plant - outside the Bratsk-Ilimsk region.

Both the TVA and the Bratsk-Ilimsk programs have contributed tremendously to national and regional economies in monetary terms.

The Shinkansen program (the first stage) was not different, with total of the revenues received at approximately 7.5 billion US dollars till 1976. These three programs were products of the national development planning or programming and were initiated directly or indirectly by the top national leaders. All of them have had some pre-history. Scientists and experts worked out some preliminary aspect of these programs long before sufficient political, economic and technological circumstances made organizational breakthroughs for the establishment of these type of large-scale development programs possible.

In any regional development study, it should not be forgotten that in reality each region is unique, it differs from others geometrically, geographically, historically, culturally, so-

cially and economically and therefore any direct experience transfer is limited. However, through the multidisciplinary case studies research using the systems analysis framework we could find strong and weak aspects of any regional development undertaking, and use this knowledge for generalization and for building of the new methodological construct which could therefore be used for the design of the new regional development projects or for redesigning existing regional development undertaking. As a result of this generalization of the IIASA retrospective case studies undertaken in the USA, the USSR and Japan the integrated regional development concept emerged.

Integrated development of any geographical and socio-economic unit encompasses joint utilization of all crucial physical resources as well as all the other ones including human resources, knowledge and organization.

Integrated development of given geographical and socio-economic unit includes organizational and management arrangements for coordination of current and future processes of utilization of all available resources.

Integrated development includes cooperation of crucial actors involved in the development process: developers, regulators and impactees.

Integrated development of any region requires a support by scientific research, computer and communication technology (appropriate hardware and software), data and knowledge bases as well as systems research.

Integrated development necessitates proper interdependence as well as variety among all the resources. The lack or idleness of some resources could made integrated development task infeasible.

Integrated development is a multidimensional construct within the socio-economic as well as physico-technological and environmental spaces. As a complex construct it is not easy to define and measure. Development as well as integrated development is a societal process, and different actors who are involved with the development process could have different concepts of integrated development, some of them

being contradictory. The methodology of systems analysis does not define the integrated regional development concept (nor other development concepts including the strategic competitiveness concept proposed by A. Kochetkov) for the given case but rather this methodology is used by all the important actors involved in the given case and through the debate resulting some more rational integrated development concept may be chosen.

The integrated regional development concept is still so complex that no one has enough experience and knowledge to solve alone this issue, moreover recent experiences in Japan, Bulgaria and Poland where in cooperation with IIASA some attempts have been made in the same direction, have shown that it is still a concept for the future, too complex for the implementation. It is, however, only through the prospective case studies in Japan, Bulgaria, Italy, Sweden and Poland following the retrospective case studies in USA, USSR and Japan that IIASA and its National Member Organization could gain the necessary knowledge in the area of integrated region development.

Should IIASA try today to establish a new international research in the field of regional development, with emphasis on competitiveness as a key issue instead of comprehensiveness and integrativeness in this research, both a new methodological framework and new case studies should be called for. Moreover, no one should expect quick results, lessons from our previous international joint East-West research in this field have shown that several scientific meetings as well as joint work on a few (at least three-four) case studies is necessary.

From the Polish side we propose one case study in Poland, short description of this proposed is given in the paper of J. Owsinski and K. Hołubowicz, presented at this workshop.

3. New Prospective Regional Development Issues

Till 1973 the main driving forces for the growth of national/regional economies were natural resources and energy

as well as material intensive industry development, and regional development policies or programs had been based on that. However, since 1974 we have observed national, regional and even world economic quakes. Economic quakes are not over yet and will continue at least till the end of 80's producing essential economic and industrial structural changes.

Nobody can precisely say when these economic quakes will be over, however, nearly everybody are able to prove that one economic and industrial stage of development is almost over and that we are approaching a new development stage.

As a matter of fact, we are in the transition phase from the energy and material intensive stage of development to the intelligence intensive stage of development.

However, industry will maintain its role of the key driving force of development and therefore we could say that we are in the process of replacement of energy, material and labour intensive production system by human and artificial intelligence intensive production system. One could assume that shortages of energy and of other natural resources will worsen, at least till expected new technological breakthrough in energy production, competition will intensify in the markets of the world, the number of highly trained and well educated people will increase, the standard of living shall continue to rise and will generate demands for a very large variety of commodities. This assumption was formulated in Japan (1984), but could also be accepted by us as well as others in thinking of the tomorrow production systems.

It is expected that the relative importance of mechanical industry will increase as well as the shares highly processed products. Companies will make more intensive efforts to develop unique products and the improvement of labour productive will become increasingly important together with the increasing needs for a more comfortable working environment. The demands for operator variety of commercial products will increase, thus the diversification of products will become intensive, the durability of products will have to increase and there will be a drastic reduction of lead times of new products. Industry will be obliged to offer more intellectual

jobs both in the number and level. A future production system must be a resource and energy saving system, which must be able to perform highly complicated and reliability-requiring tests, and to use the skills of highly qualified people. The production system of the future must have high labour productivity with quick responses to production requirements and must be highly flexible as a system.

To fulfill these requirements a future production system must be more compact than the today ones, must be more and more locally integrated and locally self-sufficient, therefore more and more locally or regionally oriented.

Spatial shrinking of the future production systems will not lead to shrinking of the markets of final highly processed products but will stimulate spatial expansion of the market over the national boundaries and will make market increasingly world-wide.

Such evolution of the production systems will make competitiveness the key issue of the regional development and regional competitiveness will possess not only national but also international or even world-wide reach.

4. Does Every Region Need A Grand Strategy?

Today's world of growing international interdependence and increasing complexity requires all countries to behave in a way to carry out their international responsibilities. Almost all countries have already had grand strategies in the past.

Does future world of growing international interdependence and approaching new technology frontiers demand all countries as well as regions within the countries to behave so as to carry out their international responsibilities ? Not only national economic development features but also regional development pitfalls could produce substantial increases not only in the national but also international instability. It seems to us that it is the IIASA's role to advise its National Member Organization on the key future development issues for the countries.

If competitiveness becomes key future regional development issue within national as well as international perspectives then all the regions within the IIASA n.m.o. countries will need their own grand strategy for at least 30-40 years ahead. It is not a role of IIASA to try to design such grand strategies for any given region, but rather to consider several cases and to prepare methodological guidelines based on generalization of international experiences.

Some regions in our countries due to lack of a proper strategy in the past already face tremendous competitiveness difficulties, and some such cases will be presented during our workshop.

Every IIASA n.m.o. country undertakes some regional development research including also systems analysis methodologies, however not many of that are focusing on the strategic policy design problems, moreover, according to our experience the international dimensions of the research usually give new intellectual as well as organizational stimuli. No one should forget that such international research is different from the national one, is long-term, needs more time for the information gathering and so on. New technology (highly automated, science intensive) will no doubt be one of the important issues which should be considered during the analysis of the strategic policy for any region within 30-40 years perspective. Any future technology will intensively use automated systems or artificial intelligence and shall be heavily supported by human intelligence, therefore it is strategically wise for any region to create or to expand the regional innovations centers and possess own research and development strategic policy. Future world and economies will no doubt be more coupled than now, and therefore an international regional economy research center would be very useful, provided it could be established. But it should be shown through the IIASA's regional development research, whether every region needs strategic regional development units and what kind of tools are necessary for a unit. Today or tomorrow computer technology will be sufficient for regional development modelling, regional data base

and also for regional development expert systems as well as knowledge bases, and therefore computer technology should not any more be regarded as an obstacle. However, institutional, research obstacles remain.

5. References

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- Knop, H. and Straszak, A. (eds.): The Bratsk-Ilinsk Territorial Production Complex: A Field Study Report. IIASA. Laxenburg, Austria, 1978.
- Straszak, A. (ed.): The Shinkansen Program. Transport, Railway, Environmental, Regional and National Development Issues. IIASA. Laxenburg, Austria, 1981.

DISCUSSIONS

Paper by A. Straszak

Discussion participants: K. Polenske, S. Ikeda, R. Espejo,
A. Straszak.

Main point of discussion was the question of influence exerted by introduction of new technologies ("intelligent production systems emerging from combination of robotics, automation, artificial intelligence and specialized computer applications") on the society in general and on the labour force and its structure in particular. Notwithstanding some analyses which suggest that the net result would be decrease of the higher skill jobs' share, it was indicated that obvious historical trends still point towards more of intellectual work and less of the physical one in the future. This was also the main factor behind the move towards the "information society", as witnessed in the Japanese national/regional plans and schemes, where it is combined with a broader quality-of-life view of regional problems.

Paper by L. Lacko

Discussion participants: R. Bolton, K. Polenske, L. Lacko.

Two questions were taken up, mainly for clarification: the contents of "background activities", which are those not needing big factories or sophisticated equipment and therefore only small input capital, and the notion of responsibility, which refers to local organizations, able to carry greater responsibility, having at their disposal greater financial resources.

Paper by G. Gavrilov and O. Panov

Discussion participants: K. Polenske, R. Espejo, R. Bolton,
L. Lacko, S. Ikeda, G. Gavrilov.

The first question touched concerned the notion of "private strategy" used in the paper. This notion refers to these strategies (substrategies) which are worked out by and for the individual organisms and which could only afterwards be inte-

grated into an overall strategy. Such strategies were said to be the leading ones on the present stage of development in Bulgaria.

Another question concerned participation of local bodies in the planning process. Thus, it turned out that local authorities are interacting in Bulgaria with the central, national level ones through the strategically-oriented dialogue with sectoral organisms, mainly ministries. Formal planning is more concentrated on elaboration of one-year and 5-year plans.

A clarification point was also raised connected with the environmental issues and resources accounted for. Thus, it was stated that over a given territory all strategically important resources are taken into consideration.

The last question concerned similarities and dissimilarities between Hungary and Bulgaria and was answered by L. Lacko. Thus, among similarities in planning for regional dimensions were quoted: care for infrastructure, environment, and recreation and tourism facilities. Dissimilarities were said to mainly reside in planning and management system. For Hungary the double approach of socio-economic and physical planning was quoted.

Paper by R. Domański

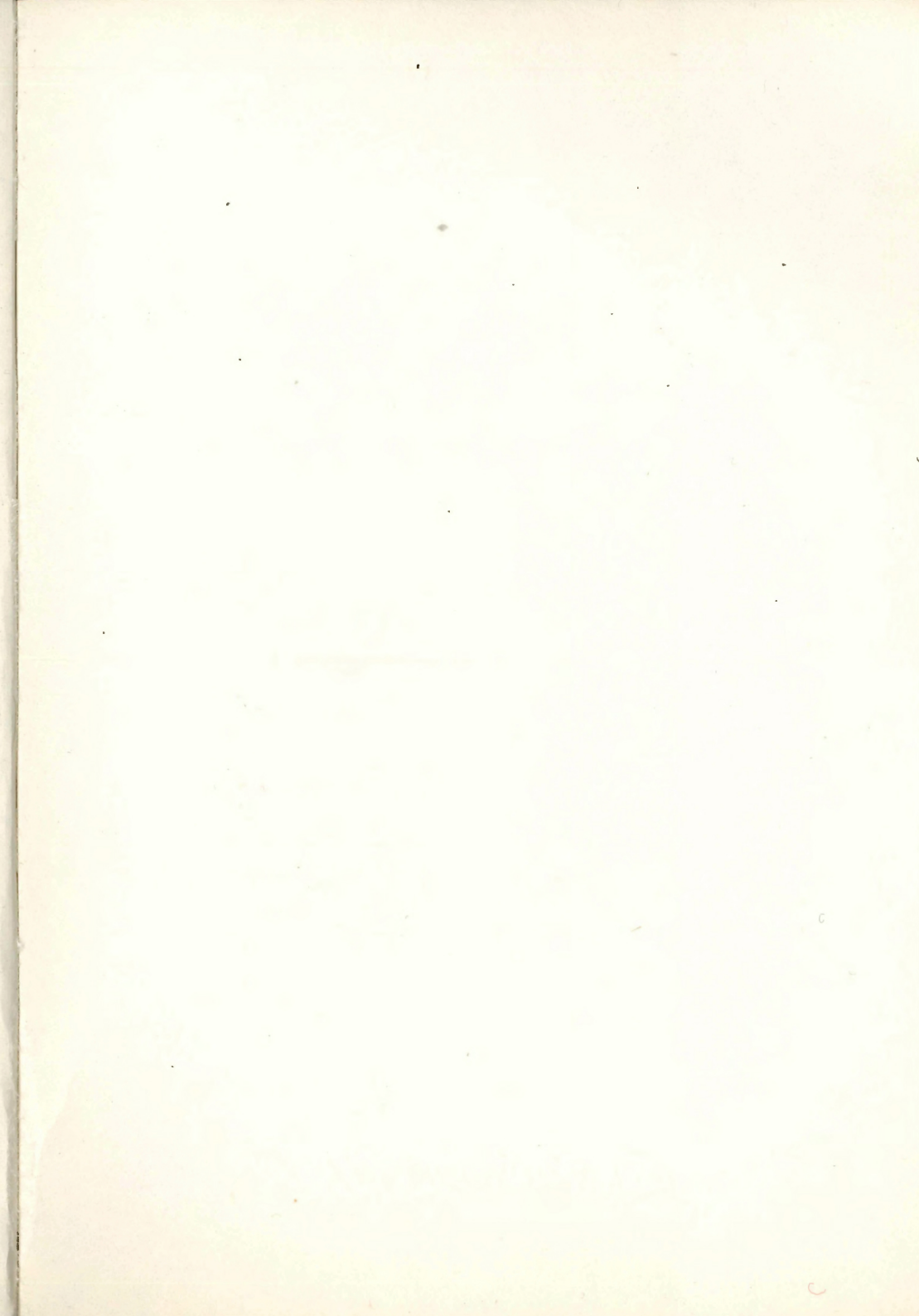
Discussion participants: L. Kajriukstis, U. Loeser, R. Domański.

Two questions were addressed: first, how can such activities as recreation or forestry be incorporated into the model, and second, whether this model can be applied to developing countries, mainly in the Third World, where large urban immigrations are often occurring. The first question was answered by stating that currently the model recognizes such spatial entities as points, lines and circles, and whichever activity can in its spatial aspect be expressed in their terms, can be incorporated in the model. As far as application of the model in developing countries is concerned, it was deemed possible to formulate appropriate mathematical structures in which problems of creation of very large urban centers and local agricultural decline could be accommodated, quite satisfactorily.

Paper by K. Cichocki

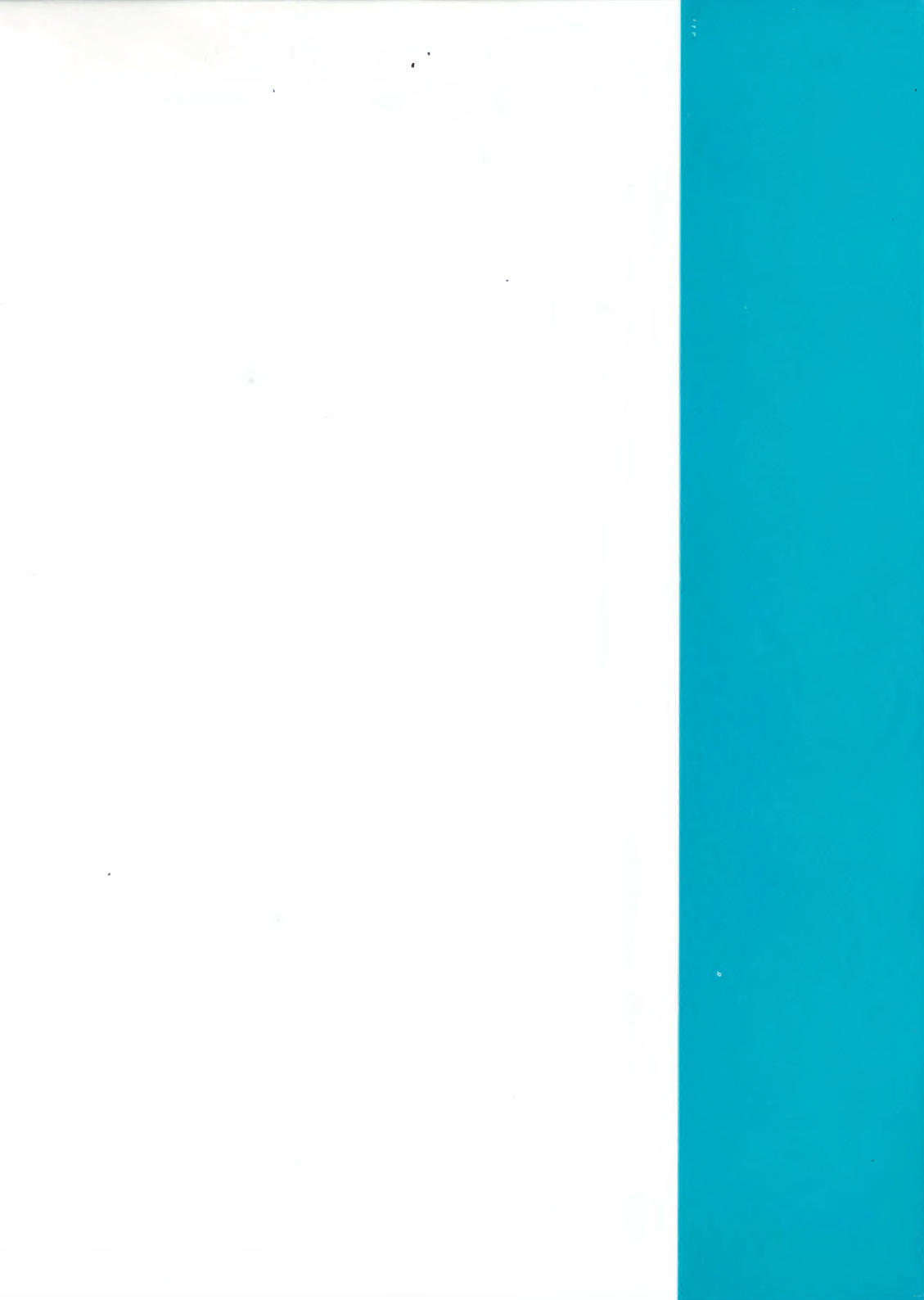
Discussion participants: S. Dresch, K. Cichocki.

Discussion centered around the role of consumption in models considered, insofar as consumption is related to the main object of these models, namely investments. It has turned out that in several runs of the models consumption was used as an element of the vector objective function. A variant envisaged takes monotonic growth of consumption as reference to objective function, with the monotonic growth based both upon official statements and on the estimates provided by analyses made by other research centers in Poland.



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