MODERNISATION OF SCIENCE POLICY AND MANAGEMENT APPROACHES IN CENTRAL AND SOUTH EAST EUROPE

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Modernisation of Science Policy and Management Approaches in Central and South East Europe

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Modernisation of Science Policy and Management Approaches in Central and South East Europe
E. Kobal and S. Radosevic (Eds.)
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Preface

This book is a result of the joint efforts of a majority of the participants in the NATO Advanced Training Course (ATC) "Modernisation of Science Management Approaches in Central and South East Europe" that was held on 28 and 29 November 2003 in Ljubljana, the capital of Slovenia. The event was organised by the Slovenian Science Foundation and was attended by 45 participants from thirteen European countries and the USA. The speakers were from NATO countries (Germany, Greece, Hungary, Great Britain and USA) and Slovenia (which became a member in March 2004). The trainees were from the South East (Albania, Bosnia and Herzegovina, Bulgaria, the Former Yugoslav Republic of Macedonia, Romania, Serbia and Montenegro and Croatia) and Central European countries (Hungary, Slovakia and Slovenia).

The motivation of the NATO ATC was to provide intensive training of public administrators (e.g. state secretaries, state under-secretaries, government counsellors and experts in science and technology policy) working at the ministries responsible for science and technology in South East European countries. Some of these countries, particularly the ones facing political and economic crises, are still not integrated into the international community. Furthermore, their scientific communities have not been able to seize the opportunities offered to them on the international level. This has often been the consequence of the fact that R&D is not supported by efficient science policies. Their social and historical frameworks prevented public administrators from acquiring adequate skills that would enable them to become active participants in the international science and technology community. In addition, many of the South East European (SEE) countries have not been able to develop modern management approaches in science. As a result, national scientific communities often do not have the support and information that they need to become integral and active players in the international arena. Without modern management strategies, these countries will not be able to use all of their intellectual and other resources, which are an essential part of economic development.

The NATO ATC helped public administrators to acquire the knowledge and skills needed to overcome some of the problems facing them in science policy management. The trainees of the course got deeper insight into the skills and knowledge needed for the successful development and constitution of national research programmes, for the development and support of international science and technology co-operation and for science management.

The articles in this book are based on the presentations given by participants of the course. We have also included a few studies (Chapters 1–3) that additionally illuminate the situation in Central and South East Europe (knowledge-based economy and society, elements of national science and technology policy). Moreover, a few special contributions from the Central and South East European participants provide additional information for people who work in science management and strive to internationalise the field of science. As a result, this volume provides a comprehensive overview of S&T policies in SEE countries for the first time and brings these countries into comparative perspective with Central

European and other EU countries. In addition, the volume contains analysis of several important science policy issues (human resource management, management of quality and finance, peer review and networking); in this respect, the volume will be of interest to a wider audience interested in S&T policy-making in general.

Edvard Kobal and Slavo Radosevic
Ljubljana and London, September 2004

Acknowledgements

We would like to give thanks to everyone who assisted us in organising the NATO ATC, as well as to those who helped us prepare this book. The book is a result of the collective effort of a large number of experts in science and technology (innovation) policy, high-ranking representatives of the government ministries responsible for science and technology in Central and South East European countries, and experienced practitioners in science management, among them Maja Bučar, Boris Cizelj, Dimitris Deniozos, Nada Švob-Đokić, József Imre, Miloš Komac, Đuro Kutlača, Zoltán Peredy, Zoran T. Popovski, Janez Slak, Milanka Slavova, Viktor Stefov, Lamija Tanović, Andrea Vass, and Guenter H. Walter.

The NATO dimension of the scientific event (ATC) gave us the opportunity to include experts from the USA, such as Professor Paul Rambaut (University of Hawaii), Dr. Norman P. Neureiter (US Department of State, Washington, D.C.), and Dr. Larry Secrest (Secrest & Co., Austin, Texas) into the preparation and implementation of the ATC.

We would also like to give special thanks to the NATO Science Programme for financially supporting the implementation of the ATC, as well as for providing the grant to publish this book. Sincere thanks also to the Ministry of Education, Science and Sport of the Republic of Slovenia for its financial support, as well as to Dr. Zoran Stančič, State Secretary for Science, Republic of Slovenia, for his understanding and help.

Not least, we would like to express our thanks and gratitude to Darja Čot, Head of International Science Co-operation, Slovenian Science Foundation, for her work during the preparation and implementation of the ATC and this book.

Sincere thanks also to Mojca Zupančič and Barbara Papež, both of the Slovenian Science Foundation, for their assistance.

Introduction

Science and technology have a paramount role in a knowledge-based society. Scientific knowledge is a form of capital and a factor in development. Strategies for its extension as a background for innovation capacities, and strategies for widespread access skills, are mandatory in the transition to a knowledge-based society. Scientific knowledge can be developed to the full only if it is supported by effective and modern science policy.

South East European countries need professional support in the form of training, as well as improving and exchanging the principles of good practice, with the aim of providing them with sufficient skills to participate efficiently in creating and implementing a common scientific policy, particularly in Europe. Providing such training is very important, since most of these countries have not been able to participate in programmes of the European Union Directorate General for Research (DG Research) (applied research and development) or European Science Foundation (basic research). The 6th Framework Programme of the European Union gives so-called "third countries" (where the SEE countries also belong) the opportunity to participate. This gives the ministries responsible for science and technology in South East European countries the opportunity to co-operate in these programmes and to open their scientific communities to the international arena. Furthermore, it gives them the opportunity to establish efficient and well-qualified administrative bodies and to adopt strategies that will follow the (scientific) strategic goals of the European Union or other developed countries in the world. This will also positively influence development of their co-operation in the NATO science programmes.

It is generally known that – compared to the USA and Japan – connections between research and the application of knowledge are relatively weak in Europe despite extensive scientific research work. This so-called "European Paradox" is true for some EU countries and, especially, for South East European countries. The large deficit is evidenced by the small, or practically nil, market success in technologically demanding areas. European awareness regarding this deficit in the area of research and development is reflected in efforts to form and implement efficient technology or innovation policies. The essence of these policies is the need to plan and implement research and development in the framework of close co-operation between business enterprises and universities and research institutes, to disseminate and optimise the results of research and development activity, and to encourage mobility of researchers and their education and training. The essential elements of these policies are quality education and human resources.

This volume brings a wealth of scholarship on S&T policy, in particular on the countries of South East and Central Europe.

Dr. Edvard Kobal sets the broad scene for S&T policy-making today by first outlining the historical legacy of these economies and how it affects their transformation into knowledge-based societies (Chapter 1). He then highlights the key policy issues entailed in the transformation to a knowledge-based economy (Chapter 2) and continues by specifically discussing the elements of national S&T policies that are conducive to this transformation (Chapter 3).

The shift toward modern approaches in S&T policy is by no means an easy and trivial exercise. The chapter by Prof. Đuro Kutlača is an excellent case of how the transfer of R&D priorities model faces a variety of difficulties when there is a change of context. In

this respect, its conclusions are quite sobering and show the often forgotten, deeply political nature of S&T policy.

Dr. Slavo Radosevic reviews the transformation of research and technology policies in new EU member and candidate states, which are a natural reference point for many South East European countries. He points to the excessively R&D/high-tech oriented nature of their policies, which neglect other elements of innovation capacity that are related to firm-level efforts and productivity improvements. He also points to problems in embracing and integrating FDI into innovation policy. These lessons are of high relevance for SEE countries.

Part 2 represents an overview of the S&T policies of all South East European countries, except Albania, and the Central European countries of Slovenia and Hungary. In itself, this is valuable review as it shows how geographically very close S&T systems have developed to very different degrees. The rich material that is presented clearly points to areas of international cooperation in S&T policy and to great opportunities for trans-national policy learning. We believe that this overview will be of substantial help to international organisations like the European Science Foundation, EU, or World Bank when designing regional programs that address S&T capabilities. In this part, Dr. Guenter Walter summarises regional technology policy issues based on his rich consultancy and research experience in the counties of Central and Eastern Europe. Regional innovation policy has become increasingly important for new member states, and we hope that candidate and other SEE countries will draw valuable lessons from past experiences in this area.

Part 3 focuses in depth on several issues in science management. Croatian and Slovenian experiences in human resource management are quite interesting and are well analysed in the contributions by Dr Nada Švob-Đokić, Dr Miloš Komac and Marjanca Bertoncelj. Chapter 16 summarises brainstorming sessions at the NATO ATC, which involved all participants and contain a wealth of know-how for all those involved in issues of finance and quality in R&D. Dr. Paul Rambaut brings a variety of national and international perspectives on peer review; in this respect, it is a highly instructive contribution of great relevance for countries whose peer review systems suffer from endemic failures typical of small and poor R&D systems. Dr. Boris Cizelj analyses highly successful Slovenian experiences in interests representation, networking and lobbying in S&T. As the international dimension of S&T policy has become the most important dimension for new member and candidate countries, his experiences and lessons are highly instructive not only for these countries but also for other SEE countries aspiring to EU membership and increased international integration in S&T.

The concluding chapter draws on the rich material that has been accumulated in the previous chapter and tries to provide analytical and policy synthesis. As such, it is aimed at donor and other international organisations oriented towards the SEE region. Also, we hope that its message will be highly instructive for policy-makers in all of the SEE countries as well as of relevance to scholars in S&T policy in general.

Edvard Kobal and Slavo Radosevic
Ljubljana and London, September 2004

Welcoming Remarks and Introduction to NATO Science Programmes

Dr. Paul RAMBAUT
Member of the NATO Advisory Panel on Science and Technology Policy

Abstract. Participants were welcomed to the Advanced Training Course and were provided with a brief description of NATO's Programme for Security through Science.

Welcoming Remarks

Chairmen, Mr. State Secretary, Ladies and Gentlemen.

I would like to welcome you on behalf of NATO and, in particular, of Prof. Fernando Carvalho Rodrigues, who is the NATO manager of the programme on Science and Technology Policy. I am sure that Prof. Rodrigues would be very pleased with the way this ATC has been organized and that he would agree when I say that it reflects the best traditions of NATO-sponsored scientific activities.

This meeting has evolved from an initial suggestion made by the State Secretary to Prof. Rodrigues. The NATO Advisory Panel on Science and Technology Policy considered Dr. Zoran Stančič's suggestion to be particularly promising and constructive. Following encouragement by NATO, the staff of the Slovenian Science Foundation, under the able leadership of Dr. Edvard Kobal, developed a detailed proposal that met all of NATO's specifications.

Dr. Kobal was also able to persuade Prof. Slavo Radosevic of University College, London to be co-director for the course along with himself. This leadership, shared between NATO-member and NATO-Partner countries is an essential requirement for NATO sponsorship.

I am particularly grateful to Mrs. Darja Cot of the Slovenian Science Foundation, with whom I was in frequent e-mail contact, for tending to the details of the proposal and for overseeing the complex logistical arrangements that followed its approval.

I am particularly impressed with the level and skill of both the specialists and trainees who have assembled here. I am convinced that their interactions will be very productive and will lay the groundwork for similar activities in the future.

Finally, I would like to thank the Ministry of Education, Science and Sport of the Republic of Slovenia as well as the Slovenian Science Foundation for the hospitality and enthusiasm with which they have welcomed the representatives of so many nations.

1. NATO Science Programmes

1.1. Historical Background

NATO's Science Programme, or as it has been recently renamed, its Programme for Security through Science, is administered by the Division of Public Diplomacy at NATO Headquarters in Brussels.

Earlier this month, NATO announced that its Science Programme had changed course. Since I was a manager of the more traditional Science Programme, I will try to put this new course into an historical perspective.

The NATO Science Programme has always dealt with international collaboration in science and the environment. It forms an important part of NATO's Third Dimension – a dimension based on Article 2 of the North Atlantic Treaty and founded on the premise that stability among nations can be achieved by enhancing their overall well-being. NATO's other two dimensions are, of course, political and military.

The Third Dimension, or non-military dimension, was established following a 1957 report called the "Report of the Committee of Three" (Mr. Halvard Lange of Norway, Prof. Gaetano Martino of Italy and Mr. Lester Pearson of Canada). The need for enhancing science in the NATO Alliance was prompted by the dramatic launch of Sputnik in 1957 and the accompanying concern that scientific advancement and scientific training within NATO nations might be falling behind those of the Soviet Union.

NATO's Third Dimension activities began with the creation of a NATO Science Committee in 1958 and, ten years later, by the creation of a Committee on the Challenges of Modern Society, to deal mainly with environmental issues.

At the first meeting of the Science Committee, in March 1958, representatives from thirteen of the fifteen NATO countries met at the Palais de Chaillot in Paris and mapped out a programme that was eventually to become renowned throughout the world for its scientific excellence. The programme has proved to be adaptable and resilient in the face of many challenges that could not have been foreseen.

1.2. Objectives of the Programme

The objectives of the NATO Science Programme have changed several times over the years.

At the outset, in 1957, its purpose was to promote scientific collaboration and education within the NATO Alliance by encouraging the mobility of researchers and the exchange of knowledge.

In 1991, following the dissolution of the Warsaw Treaty Organization, the NATO Science Programme was enlarged to include NATO Partner countries. Its purpose was thus expanded from not only promoting scientific collaboration within the Alliance but also to creating links with scientists in Partner countries.

In 1999, the Programme was changed once again to concentrate exclusively on links between NATO and Partner countries. The programme endeavored to stabilize the scientific communities in Partner countries by enhancing their interactions with the international scientific community.

1.3. Programme Activities

In its focus on NATO-Partner Country cooperation, the NATO Science Programme remained exclusively funded by NATO. It utilized a series of funding mechanisms that are still in use today. These include projects, conferences, fellowships, training courses, computer networks and expert visits.

Through these various mechanisms, about 10,000 scientists participate each year in the NATO Science Programme. In 2001, over 6000 scientists took part in over 100 NATO scientific meetings and about 100 volumes of proceedings were published. Since 1999, over 2,500 fellowships have been awarded to Partner Country scientists.

Besides the activities overseen by NATO's Science Committee, there are those overseen by the Committee on the Challenges of Modern Society. The activities of this committee, which are largely the result of direct intergovernmental cooperation, are funded directly from national sources.

The Committee on the Challenges of Modern Society provides a forum for an exchange of views mainly on environmental issues and, in particular, those that are defense-related. Under the auspices of this Committee, 68 long-term pilot studies and seven short-term projects have been completed. There are, at present, 15 ongoing pilot studies and four short-term projects. In total, over 270 publications have resulted from this programme.

1.4. New Directions

In October 2003, a new concept for NATO's support of civil science was agreed upon by the North Atlantic Council following proposals put forward by the NATO Science Committee at its meeting in Kyiv, Ukraine in June of 2003.

To emphasize the new direction, it was decided that the Programme would henceforth be known as the NATO Programme for Security through Science.

The advertised aim of the new programme is to contribute to security, stability and solidarity among nations by applying cutting-edge science to problem solving and to accomplish this through collaboration, networking and capacity-building. It was also foreseen that the programme would help to catalyze democratic reform and support economic development in Partner countries.

A feature of the new programme is to move away from bringing scientists together primarily to foster partnerships within an extended scientific community. In a world changed by the terrorist attacks of 11 September 2001, the programme will now bring scientists together to work on solving problems associated with security issues of concern to NATO, NATO-Partner and Mediterranean Dialogue countries.

In 2004, NATO's familiar Advisory Panels, which are drawn from the scientific community, will continue to peer review applications grouped into Environmental and Earth Sciences, Life Sciences, Physical Sciences, and Security-Related Science and Technology. However, support will no longer be available for all areas of science. Only applications in certain priority research topics, or in priority areas identified by Partner countries, will be considered.

1.5. Priority Research Topics

The list of priority research topics is as follows:

- Scientific Collaboration for Defense against Terrorism. The priority research topics in this area are concerned with the science involved in, for example, detecting chemical, biological, radiological or nuclear weapons or agents, or in protecting populations against such weapons, along with improved decontamination procedures and improved methods to destroy these types of weapons or agents. The priority area topics also include the medical responses needed to counteract such weapons, such as, for example, chemical and vaccine technologies. Measures to protect against eco-terrorism and computer terrorism are two additional areas earmarked for concentrated study.

- Scientific Collaboration to Counter other Threats to Security. Although the topics included in this second category are in less obviously dangerous fields, they nevertheless pose a risk to security and stability, particularly in a regional context. One such topic is environmental security where, for example, desertification, land erosion and pollution of common waterways can lead to regional or cross-border disputes. Water resources management or management of other, non-renewable, resources are two more examples of problems of special interest. Scientific models of sustainable consumption are solicited under this priority area.
- Technology Transfer to Address Partner Country Priorities. Among the priority research topics will be those specially selected by Partner countries. A process of consultation with Partner countries through the EAPC Science Committee has begun and a list will shortly be drawn up of the priority areas identified by Partner countries. Scientists from these countries will be able to propose collaboration with NATO-country colleagues either in the priorities of their own countries or in the above priority topics in Defense against Terrorism or Countering other Threats to Security. Applications that fall within both the NATO Priority Research Topics and Partner-country priorities are particularly solicited.

2. Practical Aspects of the Programme

The NATO Programme for Security through Science therefore offers support for international collaboration between scientists in countries of the Euro-Atlantic Partnership Council or the Mediterranean Dialogue. Awards are made following the consideration of applications received from individual scientists in these countries.

The support funded under the programme is channeled through a range of different mechanisms, including:

- Collaborative Linkage Grants
- Expert Visits
- Advanced Study Institutes
- Advanced Research Workshops
- "Science for Peace" R&D projects
- Computer Networking Support

In addition, a limited number of fellowships are available.

3. Management

The restructuring of the international staff at NATO Headquarters, which began following decisions taken at the Prague summit in November 2002, is now complete. The restructuring included a merger of the Scientific and Environmental Affairs Division with the Office of Information and Press to form a new Public Diplomacy Division. Mr. Jean Fournet, formerly Assistant Secretary General for Scientific and Environmental Affairs, became Assistant Secretary General for Public Diplomacy, with overall responsibility for the new Division. There are two Deputy Assistant Secretaries General, one in charge of External Relations (Dr. Jamie Shea) and one in charge of Science Cooperation (Dr. Keith Gardner).

As in the past, overall policy guidance for the new NATO Programme for Security through Science will be provided by the NATO Science Committee, which is composed of representatives of each NATO member country. The Science Committee normally meets

three times a year. One of the meetings is in a so-called Euro-Atlantic Partnership Council or EAPC format, in which the 19 NATO-country representatives are joined by colleagues representing 27 Partner countries. The Science Committee also meets twice a year in the format of the NATO-Russia Council.

The Science Committee is assisted in its work of assessing and selecting applications for support by advisory panels whose members are selected by the Science Committee from among the international scientific community. Associate members from Partner countries and Mediterranean Dialogue countries also serve on the Advisory Panels. This direct involvement of the scientific community has been invaluable for maintaining the high scientific standard of the Programme.

4. Conclusion

In concluding, I should point out that Slovenia has been an active participant in the NATO Science Programme and she is expected, likewise, to contribute substantially to the new NATO Security through Science Programme.

In only one NATO programme I can point out that, of the 125 Science for Peace projects underway in Partner countries, six have had Slovenian co-directors and about 5% of the available funding has gone to Slovenia. This has amounted to €960,000 as of April 2003.

In the future, there is every hope that Slovenia will continue to contribute substantially to the new NATO Security through Science Programme.

For its part, NATO will continue to offer effective mechanisms for Alliance and NATO-Partner cooperation and this cooperation will be focused on topics of common interest.

Thank you.

Contents

PART I

Issues in Science and Technology Policy

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CHAPTER 1

From Central Planned Economy to Knowledge-Based Society

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Abstract. The establishment of a suitable institutional environment for comprehensive functioning of a market economy in the transition countries was one of the most important and complex matters in the 1990s. The central planned (socialist) economies of Central and Eastern Europe differed from Western market economies particularly in the matter of defining markets and the roles of the state and the financial system. For the development of a well-functioning market economy, it is characteristic to emphasize: the development of banks and financial markets; the fiscal environment; private property rights and contracts; labour market institutions; institutions dealing with competition policy, industrial policy and trade policy; and trust between economic agents and the honesty of public institutions.

To establish a knowledge-based economy and society, it is important to create and strengthen the connections between knowledge sources and business enterprises. Weak connections hinder the attainment of a successful level of this kind of economy. Different means of regulation, upgrading political-bureaucratic hierarchical intervention, and a sufficient quantity of social capital are also needed.

The fall of the Berlin Wall in 1989 resulted in several political and socio-economic changes in the countries of Central and Eastern Europe and in some countries of the former Soviet Union. Making the transition from central planned (socialist) economy to market economy was the most important and crucial decision [5] adopted by countries that have already been functioning in the last few decades of the 20th century along with newly formed ones, among them also Slovenia. This decision required a number of structural and institutional reforms and the selection of appropriate methods, for instance the selection between "shock therapy" or "gradualist approach". In the case of new countries, it was necessary to attain macroeconomic stability and internal and external liberalisation. The structural and institutional reforms also included: setting up institutions; privatising state-owned assets; and reforming the business sector, financial sector, tax and pensions system, social welfare sector, public utilities and public administration [3].

It is very important for countries in transition to chose the correct pace of transition and change from distorted prices to market prices. It is also important to stay pragmatic regarding the attraction of foreign companies into the country to participate in joint ventures, as well as the adoption of recommendations given by international organizations, such as the International Monetary Fund (IMF) and the World Bank. In the process of making the transition from a socialist economy to a market economy, the IMF engaged itself especially in

matters of macroeconomics, and the World Bank in the area of structural reform. In the 1990s, during the process of candidate countries' accession, the European Commission got involved. Hence, the fall of the Berlin Wall brought a new role to the international community and its institutions.

In the beginning of the 21st century, we can also see joint actions. For instance, in February 2002, The World Bank in co-operation with the European Commission, the Organization for Economic Co-operation and Development, the European Bank for Reconstruction and Development, and the European Investment Bank organized the Knowledge Economy Forum "Using Knowledge for Development in EU Accession Countries". The goal of the Forum was to move beyond general discussion of the knowledge-based economy to a specific and practical understanding of how the global trend toward knowledge-based economies affected the accession countries, how they could respond in practical ways to the challenges posed by this trend, and how their specific institutional and economic legacies shaped their efforts to respond [6].

National reform strategies demanded the preparation of key developmental documents. In EU candidate countries, this was the strategy for accession to the European Union. The concepts and contents of these strategies were fully endorsed by the European Union as well as by the major international financial institutions.

According to the opinions of some top economists, whose points of view and beliefs are close to the World Bank's, the increasing gap in technological progress was the main reason for the change of central planned economies in some former socialist countries of Central and Eastern Europe and in the Soviet Union, as well as the for the breakdown of the Soviet bloc. At the end of the 1980s, the process of the transition from socialist economies to market economies had begun. The process of democratisation of national societies and orientation toward the European Union, as a desired option for the future of these societies, had also started.

The decision to access and integrate the countries of Central Europe and the Baltic region has been important not only for these European sub-regions, but also for the European Union. The accession of ten countries into the EU in 2004 – half of them from Central Europe – represents a great challenge to the European Union, especially for reformation of its institutions and further democratisation.

It was at the end of the 20th century, at the Lisbon Summit (March 2000), that the European Union probably became the most fully aware of the globalisation that it was facing. It became cognizant of the necessity of efficient functioning of the economic, political and social institutions that, while functioning on the pan-European level, enable the competitiveness of its economy. Europe "would become during the next decade the most competitive and dynamic knowledge-based economy in the world" [2]. Processes that took place in the candidate countries during the end of the 20th century and the first years of the 21st century have been recognized, acknowledged and, we can also say, rewarded by membership in the European Union in 2004. Hence, a few years before formal membership, the candidate countries started the second phase of transition by developing knowledge-based societies and, in the framework of these, knowledge-based economies. Relatively successfully implemented transition processes, absorbed shocks of transition and the de facto membership of candidate countries in the European Union in 2004 also act as an encouragement to other countries, especially in South East Europe, that want to attain the goals that have already been reached by some of the countries in Central Europe (Slovenia, Hungary, the Czech Republic, Slovakia and Poland).

The common goals of the European Union are reflected in a heightened awareness of how acquiring and using knowledge is increasingly becoming a key factor in determining the competitiveness of a national economy. A knowledge-based economy of course demands a coherent and proactive strategy according to the individual country. The problems