

Regional Development
and Public Policy

Regional Innovation Strategies
The Challenge for Less-Favoured Regions
Edited by Kevin Morgan
and Claire Nauwelaers

 Routledge
Taylor & Francis Group



**Also available as a printed book
see title verso for ISBN details**

REGIONAL INNOVATION STRATEGIES

THE CHALLENGE FOR LESS-FAVOURED REGIONS

Regional Development and Public Policy Series

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Regional Innovation Strategies

The Challenge for Less-Favoured Regions

edited by

Kevin Morgan and
Claire Nauwelaers



LONDON AND NEW YORK

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This edition published in the Taylor & Francis e-Library, 2005.

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A CIP catalogue record for this book is available from the British Library

A Library of Congress CIP catalog has been applied for

ISBN 0-203-38620-5 Master e-book ISBN

ISBN 0-203-69641-7 (Adobe eReader Format)
ISBN 0 11 7023795 (Print Edition)

Transferred to Digital Printing 2003

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The Innovative-Region Strategy: Lessons from the Central Macedonia Regional Technology Plan

A new direction of European innovation strategies can be described and discussed as an 'Innovative Region Strategy'. This chapter provides a concrete example for this new orientation of European innovation policies. The presentation of this experience is divided into two parts. The first part is devoted to a detailed description of the structure and the major components of the Regional Technology Plan (RTP) of the region of Central Macedonia. The second part focuses upon both an assessment of this experience and an attempt to summarise whatever lessons can be drawn from its implementation.

The theoretical foundations of the 'Innovative Region Strategy' can be traced back to 1977, when Bagnasco (1977) published his study on Third Italy. Since then, the main concepts regarding innovation, industry and territory have evolved along the different approaches such as 'district theory', 'milieux innovateurs', 'new industrial spaces', 'technopolitan development' and 'regional systems of innovation'.

The concepts of 'industrial district', 'new industrial spaces' and 'technopoles', which had major influence during the 1980s, were in fact integral parts of the 'flexible specialisation' approach. Their conceptual core lies in the recognition of the capacity of the small, specialised company to develop external linkages and networks to the highest degree, and to acquire all the necessary technology and skill inputs from the agglomeration, itself composed of other specialised SMEs. In this way, horizontal and vertical disintegration of production activities are extended, while internal economies are substituted by external economies, and economies of scale by economies of scope. The spatial form of this complex is the cluster, because within the cluster external transactions costs are minimised. Thus, the district and the agglomeration composed of districts become the dominant spatial forms of flexible specialisation (Murray 1987; Piore and Sabel 1985; Scott 1988).

In the beginning of the 1990s a new theoretical contribution was added to the discussion on regional innovation, based upon the pioneering work of Lundvall (1992) on national systems of innovation, which widened the debate on districts, flexible specialisation, new industrial spaces, and technopoles. A number of tentative efforts have been made to utilise these insights on learning and innovation in urban and regional development theory. A sophisticated attempt, according to

Morgan (1997), is to be found in the recent work of Storper (1997), who seeks to explain the rise of the local at a time when the forces of globalisation appear to be reducing the world to a 'placeless' mass. A key part of the explanation is the association between innovation, technological learning, and the agglomeration. In the same direction, Cooke and Morgan (1991) have coined the term 'intelligent region' in order to capture the complex web of relations, roles and functions of the different regional actors that promote innovation and regional development.

The Innovative Region Strategy is an evolutionary step in this ongoing debate. It focuses upon the regional innovation system in its totality, rather than on the more restricted notion of the cluster. In fact, it expands the content of the latter by introducing interventions that promote its adaptability, learning, networking, and both transfer and endogenous production of technology. On a practical level, it is based upon the experiences of innovation strategies promoted by the European Commission, namely, Regional Technology Plans (RTPs), Regional Innovation and Technology Transfer Strategies and Infrastructures (RITTS), and Regional Innovation Strategies (RIS).

The Innovative Region Strategy may be considered as an evolutionary step of technopolitan strategies, which were implemented on a broad scale in the 1980s with the development of large technology parks and 'technopolis' projects (Komninos 1992 and 1993). The new strategy attempts initially to bring to the surface the main factors behind the region's technology deficit: the archaic character of its small and medium-sized businesses, the inadequacies of its mechanisms for the diffusion of technology and the latent demand for technology and innovation services. It adopts a more integrated way of dealing with innovation, a systemic model of interaction between technology supply and demand, and a concept of innovation as a function of research, inventiveness and commercial exploitation. The basic difference between this strategy and the strategy of technology poles is in the promotion of a more decentralised regional innovation system, which exploits the existing industrial and research capability of the region, and seeks to integrate local technology supply and demand.

The Regional Technology Plan of Central Macedonia was a pilot project along these lines. It was a joint initiative of the European Commission, the Ministry of Macedonia and Thrace and the Aristotle University of Thessaloniki, which aimed to promote capacities for innovation in Central Macedonia. This goal was to be achieved through the elaboration of a regional innovation strategy and the forging of consensus among all the major regional partners involved with applied research, cooperation between research and industry, technology transfer, provision of technical skills and entrepreneurial capabilities under a strategic action plan defining the priorities for the renewal of products, production processes and the competitiveness of regional firms in global markets.

THE REGIONAL TECHNOLOGY PLAN (RTP) OF CENTRAL MACEDONIA

With a population of 1.7 million, Central Macedonia is a large and dynamic region in northern Greece that maintains a prominent role in the Greek regional system, especially as a pole of international significance in the wider Balkan area and a European Union gate region in its south-east borders. With a GDP of 2.3 trillion drachmas, the region represented 16.1 per cent of the national GDP in 1993, while its composition was 16.9 per cent primary-sector, 27.5 per cent secondary and 55.5 per cent tertiary. The employment structure of a total active population of 0.7 million was, in 1991, 20.9 per cent primary-sector, 27.6 per cent secondary and 46.5 tertiary, while unemployment was 7.6 per cent—below the 8.1 per cent national average. In the beginning of the 1990s Central Macedonia had a GDP per capita (in Purchase Power Units) of 46.8 (compared with the overall figure of 100 for the EU twelve), ranking fifth among the thirteen Greek regions but occupying one of the lowest positions among the European regions.

The region of Central Macedonia constitutes one of the thirteen programme regions of Greece and has three independent tiers of administration. The regional tier is part of the decentralised central state structure, while both the prefectural and the municipal tiers are represented by directly elected local authorities. Analytically, these tiers are:

- The regional tier: this is an administrative unit, headed by the general secretary of the region, who is appointed by central government, with nominal responsibility over the coordination and supervision of all state agencies decentralised at the peripheral level. Its most important function is its direct involvement in the formulation, monitoring and implementation of the Multifund Operational Programme (MOP) for regional development as an integral part of the European Community Support Framework.
- The prefectural tier: Central Macedonia is divided into seven distinct prefectures. They correspond to the second tier of local government and constitute a directly elected local state with various departments, offices and directorates possessing concrete administrative capacities. However, because it was established only recently (in 1994), and because the central state has been reluctant to devolve important administrative functions to the prefectural level, there exist many uncertainties and ambiguities over the exact range of its responsibilities.
- The municipal tier: the 626 municipalities in the region correspond to the first tier of self-government. They possess very limited resources and very few administrative capacities in relation to the management of specifically defined local issues such as the collection of garbage, the running of pre-school and primary education establishments, etc. There is an ongoing programme encouraging the drastic reduction of the number of municipalities in the region.

An important feature of the regional productive system is the dominant role of SMEs, which are characterised by generally low levels of organisation and considerable management deficiencies. The average size of regional manufacturing is 6.5 employees per firm. This is very low, even in comparison with the national figures. Small and medium-sized units account for 98 per cent of all manufacturing firms and absorb 72 per cent of total industrial employment. Industry covers most of its technology requirements by purchase from abroad, while most inward investment is focused on traditional industrial sectors (foods and beverages) or sectors with a wide consumer market (electrical machines and appliances). An equally important investment occurs in the tertiary sector (insurance companies, banks, transport companies), as well as in commerce, with a series of superstores which have located on the outskirts of Thessaloniki in order to tap the local consumer market and the markets of neighbouring prefectures as well.

The major tool of development planning and the channelling of public intervention is the Community Support Framework (CSF) 1994–99. This represents an amount of 30 billion ECU and consists of a regional component covering 25 per cent of the total (within which the Central Macedonia Multifund Operational Programme covers an amount of 977.4 million ECU) and a national component of 75 per cent of the total through which other Sectoral Operational Programmes finance a significant number of projects in Central Macedonia.

The regional innovation strategy for Central Macedonia was developed in five stages. The setting-up of the plan includes the methodological, institutional and organisational constitution of the Central Macedonia RTP. The analysis of the regional productive and innovation systems focuses on the productive system of Central Macedonia and the technology demand, supply and transfer in the region. The innovation support strategy deals with the formulation of a strategy supporting the innovation capacity in the region; it exploits the conclusions of the analytical approaches in order to identify and formulate problems and deficiencies, and to define interventions on the level of the regional innovation system. The action plan for an innovative region codifies the conclusions drawn from the previous steps and attempts to create an innovation-friendly environment supporting all businesses in the region. Finally, implementation examines the ways in which the regional innovation strategy can be interwoven with operational programmes of the second Community Support Framework and of the relevant community initiatives, which constitute principal financial sources for the implementation of the RTP priority projects.

Setting Up the Regional Technology Plan

The preparation of the Regional Technology Plan of Central Macedonia was a complex collective effort. It lasted for two years (1995–97), during which 39 specialised reports were produced, and more than 200 scientists, public officials and businessmen were involved in the process (see Komninos 1997). Recently,

the plan has entered its implementation stage with the application of seven priority projects.

The objectives of the plan were:

- To investigate the processes of technological development in Central Macedonia and to define the strengths and weaknesses of the regional innovation system.
- To ensure an agreement between the principal bodies and agencies of government, the regional firms, the workers' organisations and the universities, on the priorities of technological development in the region.
- To select projects and actions that sustain the technology and innovation capacity of the regional firms and to investigate their feasibility.
- To implement these projects in cooperation with the Structural Funds and to attract funds towards actions sustaining the technology and innovation capability of the region.
- To establish a monitoring system to evaluate the effects of the plan and to diffuse information on innovation and development of Central Macedonia.

These objectives are closely related to EU regional policy. While EU policy adherence is not a prerequisite of the RTP concept, it arose here out of the actual development situation in Greece and Central Macedonia. The process of economic and monetary union and the intense effort of the country to meet the targets of the Maastricht Treaty connect most of the public and private investments to the Structural Funds and the Community Support Framework. The latter has become the dominant tool for the selection and implementation of projects and initiatives to renew the country's infrastructure and production capacity. In this sense, the principal problem in the development trajectory is to make a correct use of these resources, to sustain projects with major multiplier effects and to coordinate the public and private initiatives for modernisation and growth. The overall objective of the plan is to enable regional industry to work at best-practice level in the technologies relevant to it, to enhance the emergence and growth of new industrial branches, and to promote international technology cooperation and competitiveness to international markets.

A logical consequence of the objectives set was to focus the actions of the plan on the regional innovation system. The regional innovation system is part of the productive system of the region and the established mix of activities, linkages and institutional regulations. It is the system that drives technology and innovation to companies and intermediary organisations in the region. Focusing the plan on the regional innovation system was a principal methodological choice. The rest of the method was based on common planning approaches, such as the articulation of analysis and strategy, the specification of strategy into projects, the investigation of the implementation framework and the organisation of monitoring and evaluation.

The Central Macedonia Regional Technology Plan was managed by two bodies: the steering committee and the management unit. The steering committee was composed of sixteen representatives coming from the public sector (five members), the private sector (six members) and the scientific institutions (five members) and was responsible for the political orientation of the plan, ensuring an agreement on the character of technological development in the region.

The management unit provided scientific expertise and support for the policy guidelines of the plan and introduced proposals to the steering committee. It was composed of four persons from the Department of Urban and Regional Planning, Aristotle University of Thessaloniki, and the Department of European Programmes, Ministry of Macedonia-Thrace. The work of the management unit was supported by a large number of internal and external working groups, which provided scientific expertise and analysis on issues related to regional development, technology demand and supply, technology transfer and planning for innovation infrastructures.

The key issue in the overall decision-making process was the effort to create a broad base of regional support for the plan. Reaching consensus was a permanent concern of the management unit, and implied the preparation of all decisions, from the creation of working groups to the definition of priorities and the selection of projects, in consultation with the participants in the steering committee. Furthermore, to increase the motivation of the various parties involved in the planning process, we tried to assure their participation in the implementation and evaluation of the plan. The general support expressed for the RTP justifies these orientations and indicates a growing interest in its promotion and implementation.

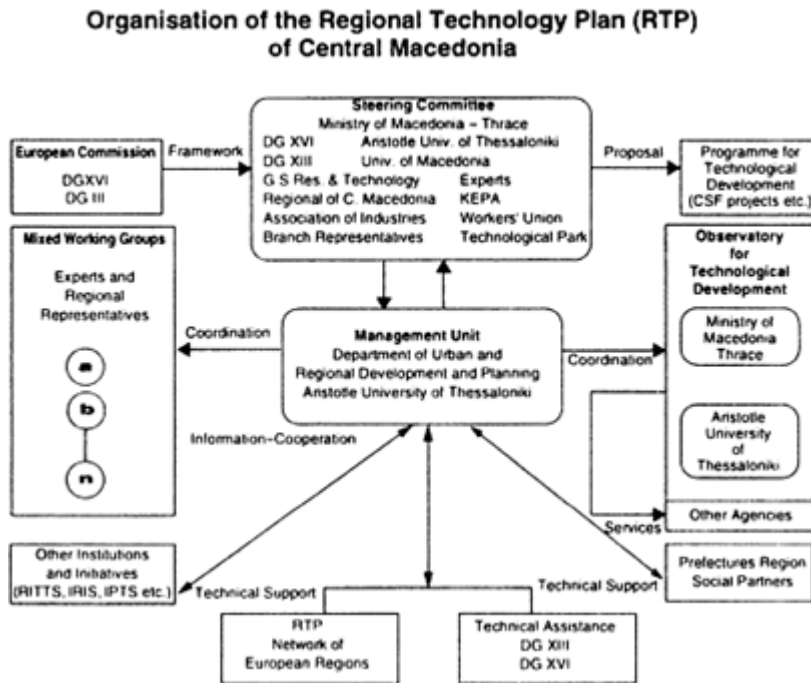
The Regional Productive and Innovation Systems

In Central Macedonia technology and innovation spring from the regional innovation system. This can be considered as the ‘brain’ of the production system, since it has the responsibility for the modernisation and adaptation of regional activities to changing external conditions, technologies and competition. Understanding the innovation system in Central Macedonia was a central issue of the Regional Technology Plan. In contrast to a long-standing tradition of technology planning emphasising the supply side, on the assumption that industry would adapt to improved technology supply, this plan was highly determined by demand, which defined both the strategic priorities and the selection of projects within a framework of established priorities.

The regional innovation system in Central Macedonia (figure 6.2) has been analysed from four different points of view, concerning the spread and application of generic technologies, the regional technology demand, the regional technology supply, and the transfer of technology.

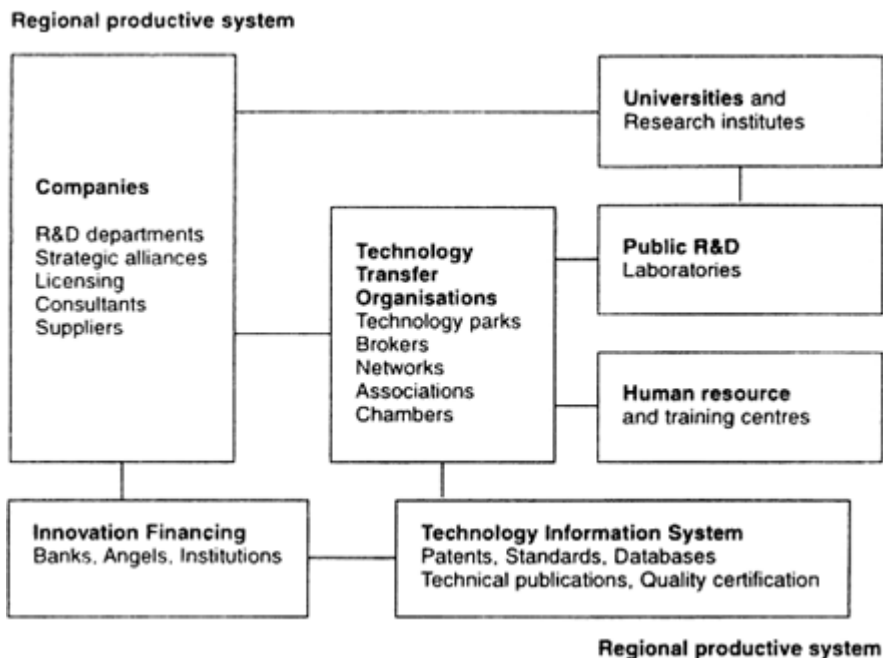
A multilevel survey (based on technology audits and experts reports) looked at the main characteristics of regional technology demand and outlined the technology needs of firms. For the companies participating in the survey, the main

FIGURE 6.1: MANAGEMENT AND ADMINISTRATION STRUCTURE OF THE RTP



source of technology was by the purchase of equipment. The development level of internal R&D departments was generally low, and only exists at all in large and well-organised companies. Very few companies have special R&D departments, while in some companies R&D is carried out by either the production department or the quality control department. R&D levels are generally considered inadequate because the level of R&D is in many industrial branches fairly low, and information flow and dissemination of research results both from Greece and abroad are insufficient.

For most companies, the idea of collaboration with other companies in the same branch has gained little ground, owing largely to lack of interest, suspicion, lack of finance and the absence of a spirit of collaboration within the business world. On the other hand, many companies subcontract and/or collaborate with producers of complementary products. Most companies surveyed lay great weight on producing quality products to meet market demands. Suggested ways of improving quality include automation and certification of production processes. A certain number of companies have already been awarded certification (mainly under ISO 9002), or are in the process of doing so. In fact, certification is one of the major company trends for the future. Most companies either already apply or are prepared to apply total quality management procedures, which reflect industry's

FIGURE 6.2: COMPONENTS OF A REGIONAL INNOVATION SYSTEM

realisation of the importance of the human factor in the production of quality products.

Technology objectives and requirements of the firms surveyed focus mainly on:

- product improvement, through the purchase of new equipment, the implementation of new technologies, the installation of automation systems, and better raw materials (new materials or better quality control);
- the development of new products via new technologies in accordance with market requirements;
- improved quality control procedures by the addition of supplementary equipment and trained personnel;
- improved product distribution.

At the same time, a major obstacle hindering innovation was stated as the high cost of money and the limited innovation funding available to companies.

There is also a clear need for qualified middle management, especially in the prefectures other than Thessaloniki. In certain sectors (textiles, non-metallic minerals) there is a tremendous need for middle-level and qualified staff (e.g. foremen, qualified technicians, etc.), who are usually trained on the job rather than in special schools.

Supplementary information on the regional technology needs was made available from an extended survey through questionnaire. This survey was based on a list of 1,900 businesses covering 92 per cent of the total number of businesses having more than ten employees in the Central Macedonia region. The data include information on the location of the firm, number of employees, turnover and industrial sector, as well as figures from their annual accounts and other quantitative indicators (current assets, net worth, gross income, investments, etc.). This survey permitted the description of the use and need for more specific technology and innovation areas. These included:

- industrial information technologies;
- automation;
- quality control;
- anti-pollution technologies;
- agro-technologies;
- funding for modernisation;
- funding for research, technology and innovation;
- participation in the Fourth European R&D Framework Programme;
- participation in business technology cooperation networks;
- improvement of human resource technology skills;
- cooperation with technology transfer organisms;
- technology cooperation with the universities;
- new infrastructure for telematics, professional premises and installations.

On the opposite side, the investigation into technology supply was designed to identify applied research activity in Central Macedonia and the potential for technology applications to companies stemming from non-company research centres.

Research activity in Central Macedonia is fragmented into a large number of small research units: 277 research units for applied R&D were identified and listed, of which 138 are university laboratories. The technology areas that concentrate most of the above units are related to agro-technologies, biology and biotechnology, and the technologies for materials.

Despite the significant number of research units providing technology services to companies, the degree of collaboration between research and enterprise does not appear to be very great. Only 30.6 per cent of the units polled felt that they provided substantial support services, replacing company R&D departments with their own R&D services. The main source of their inability to develop strong bonds with companies was considered to be the companies themselves. About half the research units attributed this low level of collaboration to a lack of interest on the part of the companies concerned. A significant number attribute the difficulty of collaborating to the lack of infrastructure and to the lack of personnel, equipment and space. Another restrictive factor was the institutional framework within which

the public entities functioned, especially with regard to billing for services rendered.

A third important field for the innovation system in Central Macedonia concerns technology transfer mechanisms. Technology transfer was analysed from the point of view of the related public support, the university-industry interface, and the inter-firm technology cooperation in Central Macedonia. For the latter, a small survey was carried out covering the technology collaboration between companies (subcontracting, networks, licensing), as well the foreign direct investment in the region and the technology cooperation between local and foreign firms. The principal conclusions drawn from the technology supply analysis was the limited correlation between the scope of technology suppliers and the needs of regional companies:

- The provision of technology services was concentrated mainly on the Aristotle University of Thessaloniki and was fragmented into a large number of research laboratories.
- The overall organisation of technology services was not clear, and many entrepreneurs thought that information about and access to such services was difficult.
- Interest expressed by enterprises in the research activities carried out by the laboratories and their possible applications was limited.
- The number of laboratories that transferred technology to enterprises was minimal.
- There were no competence poles, especially in technologies with a broad range of applications.

These findings suggest that technology transfer constitutes the number one problem in Central Macedonia; on the one hand, companies cover their technology requirements by turning to external sources and, on the other hand, the external sources active in the region do not take into consideration the needs and the problems of local businesses. Regional firms lack both in-house technology capacity and external input from their immediate environment.

Innovation Support Strategy

The analysis of Central Macedonia's regional innovation system showed that the main problem in the region may be defined as the 'latent integration' of industry and technology that characterises both technology supply and technology demand.

By 'latent technology supply' we mean the informal operation of the system for the technology supply and transfer, in which the inflows of technology and innovation in the industrial sector are not recognised as distinct units. This is associated with three events:

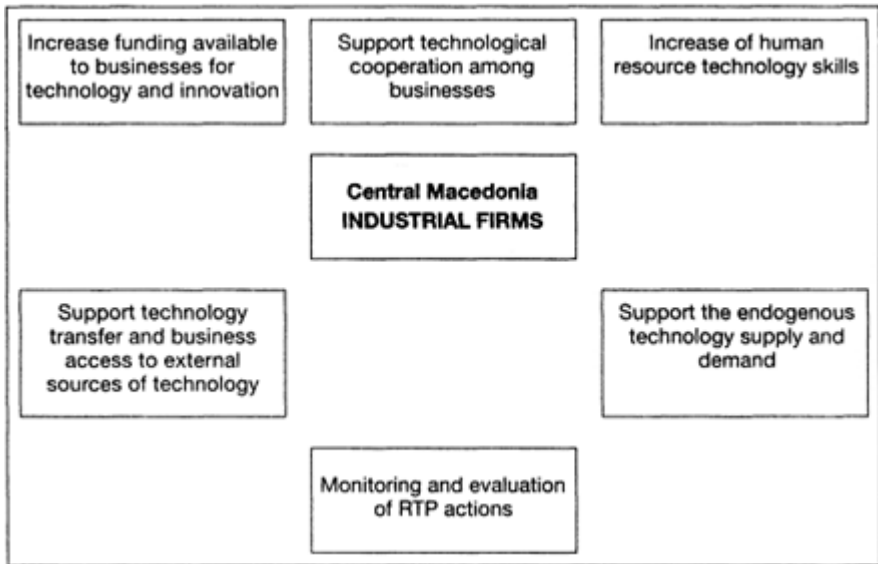
- The main route by which businesses acquire new technology is through the purchase of mechanical equipment. In-house R&D departments are rare, although in some cases R&D is carried out by production and quality control departments.
- Inter-firm collaboration, which is a major source of technology know-how, is primarily in the form of subcontracting. The subcontractor works according to the plans, production methods and product specifications provided by the principal; this dependence seriously restricts motivation and the incentives for innovation.
- Technology dissemination and collaboration between industry and research are both limited. Research activity is concentrated primarily in university laboratories, and is fragmented among numerous small units without any specific clear industrial goal or connection. This is a structure that does not allow for the development of complementarity, interdisciplinary activity or the constitution of large-scale poles of competence.

All three routes for technology supply in industry are covered by broader activities and relationships: the purchase of technology by the purchase of equipment and machinery, the exchange of technology through subcontracting relationships between firms, and the technology dissemination via the loose relationships between industry and the universities. Academic activity, subcontracting relations, and machinery purchase are buffers to actions aiming to introduce innovations and restructuring into the technology transfer and supply system.

By *latent technology demand* we mean the lack of active technology demand and the low awareness in industry about the capabilities of new technologies to deal with production, competition and marketing problems. Lack of awareness and low information inputs prevent firms from understanding their real needs and developing adequate solutions to fulfil these needs. This concerns the spheres of both marketing and production.

On the other hand, the region's firms have a tendency to seek competitiveness through defensive strategies of deskilling, low use of human resources and excessive investment in equipment and automation. Innovation needs are concealed both in the production process, where automation problems prevail, and in product development, where the problems are those of quality rather than of new product design and development.

At the centre of these weaknesses lies the region's *industrial management* and its difficulties in following advanced business strategies. For the average European industrial firm, innovation is not an abstract concept, but is bound up with the firm's ability to apply new methods and technologies to production (automated machinery, flexible workshops, horizontal shopfloor structures), to the product (new products, small batches, short production runs, quality circles, total quality control), to inter-firm relationships (just-in-time delivery systems, production networking, externalisation of services, steady producer-supplier relationships) and to the work force (flexibility, upgrading of skills, multifunctional work

FIGURE 6.3: PRIORITIES SET BY THE CENTRAL MACEDONIAN RTP

culture). The gap between firms in Central Macedonia and their counterparts in Europe's more advanced regions reflects in miniature the true technology gap, which covers the fields of commercial strategy, technology inflow and individual ingenuity in adapting to an ever-changing international environment.

The strategy of the RTP will therefore focus on Central Macedonia's industrial firms, and especially on their latent research and technology integration. These constitute the plan's basic orientations for action. From this point of view the priorities finally established for the RTP are grouped into six different areas, each with a distinct thematic objective and goal. Of these, five pertain to Central Macedonia's businesses and the factors affecting their ability to innovate, while the sixth covers monitoring, evaluation and adjustment of the actions of the RTP.

- **Increased funding for research, technological development and innovation:** this both promotes the modernisation of existing businesses and encourages the creation of new hi-tech firms. In numerous dynamic areas in Europe and the United States, forms of risk capital have greatly contributed to the development of high-tech industries. However, the actions recommended by the RTP have nothing to do with the creation of new institutions, like the venture capital measures included in the Operational Programme for Industry, but are instead addressed to the direct utilisation of existing funding mechanisms. More specifically, actions were designed to utilise funds available under the Second Community Support Framework and the Fourth R&D Framework Programme of the European Union.

- Support for technological cooperation among businesses: this constitutes a central priority for the expansion of innovative production methods and products. It is claimed that ‘businesses learn better from other businesses’, and on this basis inter-firm relationships, supplier-producer relations and networks are all crucial factors in innovation. In this area, RTP actions focus on the one hand on the development of technological collaboration networks within specific industrial branches, and on the other on attracting technology-intensive foreign investments that would then act as initial poles for new industrial sectors. The actions included in this area are designed to complement the actions for business networks included in the programme of the Ministry of Industry ‘The Future of Greek Industry’.
- Increase of human resource technology skills: this is designed to promote new business strategies that depend on the active participation and technology capability of the firm’s executives and employees. The RTP emphasises in-house personnel training, and stresses the link between training and finding (or keeping) a job. Particular weight is given to training for entrepreneurs and senior executives on matters relating to innovation management, export promotion and risk management associated with investment in south-eastern European countries.
- Support for technology transfer and businesses’ access to external sources of technology: this deals with the external technology and innovation environment of firms. The complexity and rapidity of technological change have shown that external sources and technology transfer are important factors in the technological structure of any business, be it large or small. Especially in Central Macedonia, the limited development of in-house R&D departments makes turning to external sources of technology even more important. RTP actions in this area focus on two principal orientations: on the one hand, they aim at the development of horizontal technology transfer mechanisms, in which all those involved in research, technology and business would cooperate in order to cover broad technological sectors; on the other hand, they seek to develop sectorial mechanisms for technology transfer, thus ensuring coverage of the technology requirements of the region’s principal industrial branches.
- Supplementing these orientations is the *support of endogenous technology supply and demand*, which is concerned with the development of local applications within specific technology sectors (information technology, quality, environmental technologies, agro-technologies). A major problem to deal with is the latent technology demand. The RTP actions are designed to broaden the local market for a number of important technologies. However, these actions cannot be undertaken by the businesses themselves, since they require significant effort with no guarantee that they will pay off in the long run. Their effects are diffuse, making them collective actions from which all the businesses in the area will benefit, either as users or as providers of these technologies.

The five areas of priorities just mentioned focus on Central Macedonia's businesses. They promote innovations in the basic area of business strategies—in production methods, in products, in inter-firm relationships and in personnel and executive training. At the same time, they facilitate access to various levels of technology: horizontal technologies, sectorial technologies, and specific technologies as well. The last priority area is different: it is associated with the application and effectiveness of the regional technology strategy promoted by the RTP. This includes monitoring the actions, developing criteria and evaluation coefficients and fine-tuning the plan while it is being implemented. In this case, the sole action is the expansion of the RTP Observatory, as a mechanism for the monitoring, evaluation and adjustment of all actions pertaining to the upgrading of the innovation system in Central Macedonia.

The Action Plan

The priorities of a plan provide a strategic framework of orientation. However, the decisive factor is the manner in which those priorities are specified and translated into particular action and projects. In this sense, the transition from priorities to projects is a process of evaluation by which specific projects are rejected or accepted. A system of evaluation is thus required, according to which a project may or may not be included within a priority.

A summary of the action plan is presented in [figure 6.4](#), with indication of the priority projects that reflect the maturity and significance of the respective areas. The formulation of the action plan demanded three components: priorities, projects to specify the priorities, and evaluation to select the projects that best express the priorities. In the case of the Regional Technological Plan of Central Macedonia, the priorities resulted from the analysis of strengths and weakness of the regional innovation system, the projects emerged 'from below' (in the form of proposals submitted by political and economic agencies in the region), and evaluation of the projects was based on the investigation of the technological demand involved in them.

The procedures for assembling the projects that specified the priorities were relatively simple. The political and economic agencies of the area had been informed of the Regional Technological Plan and they were asked to propose appropriate projects. Each project was supposed to determine a set of services to support the technological and innovative capacity of the region (e.g. the funding of innovation, technology transfer, the dissemination of research, etc.) and an implementing agency as well.

Using this method, a large number of proposals were assembled. They were then systematically discussed at successive meetings of the steering committee and evaluated on the criterion of their feasibility and the interest that businesses in Central Macedonia might display in the services which they could offer. In total, 22 projects were selected.

FIGURE 6.4: ACTION PLAN SUMMARY**Priority 1***Lead project*

- Funding businesses for technological modernisation.
- Funding businesses for research and technological development.
- Funding businesses from European R&D programmes.

Priority 2*Lead project*

- Foreign direct investment and international technology cooperation.
- Networking in the food industry.
- Networking in the textile industry.

Priority 3*Lead project*

- Employee technology training.
- Training in innovation management.
- Training in risk management and in the south-east European investment environment.
- Training in quality and exports.

Priority 4:*Lead projects*

- Technology transfer department at the Thessaloniki Technology Park.
- Textile Institute of Northern Greece.
- Centre for Research Dissemination at the Aristotle University of Thessaloniki.
- Food Institute of Northern Greece.
- Local centres and network for technology services.
- Centre for Industrial and Developmental Studies of Northern Greece.

Priority 5*Lead project*

- Association for Industrial Information Technologies.
- Association for Anti-Pollution Technologies.
- Association for Automation Systems.
- Association for Quality Control.
- Association for Agro-technologies.

Priority 6*Lead project*

- Expansion of the RTP Observatory.

Implementation

Following the above strategy, the action plan was defined by six priorities and twenty-two projects. Each priority includes specific projects falling into two groups: lead projects, marking the character of the priority, and projects that fulfil the conditions for immediate implementation. Most projects are fairly elastic with respect to size: in other words, they can be implemented on different scales, from experimental through small to large. The extent of their application may be finalised once the initial stages of implementation have been completed and the evaluation by the recipients has been assessed.

The particularity of the Central Macedonia RTP as it is reflected in the action plan is that it is expected to be implemented via separate operational programmes within the Second Community Support Framework (CSF) and some relevant community initiatives (SME, Interreg, Adapt, etc). This decentralised implementation structure requires on the one hand the adjustment of the RTP Action Plan to the procedures of the Structural Funds, and on the other, the organisation of a central hub to record, monitor and assess the progress and the results of the various actions on the regional innovation system and the technological capacity of the regional firms.

An effort was made to identify and list all the actions of the operational programmes within the Second CSF and the Community Initiatives that may support the implementation of the RTP. This analysis led to a selection of the subprogrammes, measures and actions from various operational programmes, such as:

- the Central Macedonia Regional Operational Programme;
- the Operational Programme on Industry;
- the Operational Programme on Research and Technology;
- the Operational Programme of the Community Initiative for SMEs;
- the Operational Programme of the Community Initiative RETEX;
- the Operational Programme of the Community Initiative Interreg;
- the Operational Programme of the Community Initiative Adapt;
- the Operational Programme on Energy;
- the Operational Programme on the Environment;
- the Operational Programme on Education and Initial Vocational Training.

These programmes may sustain the projects described in the action plan and show that there is substantial potential for linkage with the RTP. It should also be noted that many of the projects and actions included in the above operational programmes have not yet progressed to the implementation stage, and in this sense the list remains 'open' for the introduction of new projects and actions.

For the monitoring of the plan, a Regional Innovation Observatory was developed as a local hub for the collection, evaluation and dissemination of information relating to the RTP and its results. This information system, accessible

via the Internet, is composed of experimental infrastructure functioning at the Aristotle University of Thessaloniki and the Ministry of Macedonia-Thrace. This infrastructure supports the dissemination of information relating to the RTP, the innovation system in Central Macedonia, and the full presentation of the objectives, method, work packages, strategy and projects prepared within the framework of the plan. On an average, fifty-five hits per day have been recorded from 78 'visitors' from various countries of Europe, the USA and Australia. The thematic structure of the observatory includes three main sections, dealing with:

- the regional technology plan (objectives, administration, deliverables, working programme, work packages, action plan, interim and final reports);
- the economic and technological development in Central Macedonia (geographical units, population, employment, industrial structure, GDP, technology demand and supply, etc.);
- the innovation support infrastructure in the European Union (innovation infrastructures in Greece, innovative urban and regional development projects, support for innovation and technology from the R&D framework programme, etc.).

In a more developed form during the implementation, this information system will become part of the evaluation, by collecting and processing information from numerous observation points at the recipients of the RTP actions. Such information will permit a full development of on-line services, on the prefectures of Central Macedonia, the demand and supply of technologies, the industrial location areas, the innovation environment, the trends of industrial branches, and other more specific issues.

The implementation of the action plan is expected to be a long-term process. In effect, it will be an open-ended procedure leading to the formation of a more coherent Regional Innovation System.

THE INNOVATIVE REGION STRATEGY: LESSONS FROM THE RTP EXERCISE

Regions are complex socio-economic systems which are inserted in many different ways into the wider national and international regimes of overlapping and/or conflicting orders. It is common for regional development theorists to think of particular regions in terms of general models and concepts, while consultants and policy-makers tend also to provide general solutions to be applied in particular regions.

It might be true that all approaches have to face a common set of questions. Why do some regions succeed while others fail despite the similarity of targets, size of effort and political commitment? Why does the same set of measures seem to be effective in one region but totally ineffective in another? What is the appropriate mixture of actions in each case? However, as the 'Innovative Region

Strategy' approach implies, regions are not passive containers or testing grounds for various kinds of theories and policies. Instead, regions react and participate in the evolution of their structures.

In the context of the above comments we should now turn to the particular lessons that can be learned from the Regional Technology Plan of Central Macedonia. These lessons are presented as a series of propositions or themes that summarise the experiences gained during the two years of continuous efforts to coordinate and cooperate with a large and diverse group of individual and institutional actors in order to forge a consensus concerning the priorities for the promotion of regional innovation capacities. These themes can be seen also as a list of warnings for anyone concerned with the development of regional innovation systems in either theoretical or practical policy-making terms.

The Clarity of the Initial Concept

It is important to develop an initial concept or idea around which to build a set of interlinked key targets. This initial idea should make almost self-evident its appropriateness and practical effectiveness to all or most of the prospective participants in order to launch the endeavour. For this to happen the initial idea should be an already mature issue that has aroused both the interest and the expectations in the region. In the case of Central Macedonia the key terms were 'technological innovation' and 'the community support framework'. Since the beginning of the 1990s most regional actors were perfectly aware that the regional prospects depend on the ability of the regional economy to respond effectively to the opportunities offered by the opening of the wider Balkan and East and Central European Markets. On the other hand the region had the experience of the First Community Support Framework (1989–93) and the perspective of the Second Community Support Framework (1994–99) that allocated important sums of public resources for the upgrading of the available social, technical and economic infrastructure. Thus when the management unit presented the draft proposal in response to the RTP initiative of the European Commission to the Ministry of Macedonia and Thrace for the construction of an action plan to orientate the existing operational programmes of the Community Support Framework, there was an immediate positive response.

Recognition of the Actual Interests of the Partners

The same was equally true for all the major partners in the RTP experiment that were approached by the management unit. As it happened there was a gradual build-up of the interest to participate and support the RTP efforts. The first to become involved were the representatives of regional business, the Industrial Workers Union, government agencies (the Ministry of Macedonia and Thrace, the general secretary of the region, the general secretary of research and technology) and major technological service providers such as the Aristotle and Macedonia

Universities and the technology park. The interest of the European Commission was already given, as three Directorates (III, XIII and XVI) were to be represented in the steering committee of the project. The actual interest of each of the above players has a different origin and rationale. Business representatives were concerned particularly with the reorientation of the CSF funds for the provision of producer services and capital contribution to new ventures. The trade union representatives were explicitly concerned with the impact of the new policies upon the number and the content of jobs as well as with the potential to finance training and retraining. The government agencies were more sensitive to the political costs and benefits from their involvement and the possibility of employing the RTP for the reallocation and faster absorption of CSF funds. Technological service providers were keen to promote the selling of their research and development expertise and the upgrading of their research infrastructure through both public and private funding. Finally, the European Commission had an interest in monitoring the implementation of their policies and to guarantee the balanced presence of the respective DGs in the monitoring and evaluation of good and bad practices.

Competition and Cooperation Between Partners

It is easily understandable that such a mixture of interests does not lead automatically to a harmonious outcome. Indeed, there is need of an initial period for the bargaining between interests, the clarification of misunderstandings and the conclusion of agreements between the competing and/or cooperating partners. As it happened, the instances of competition were more numerous in the beginning, while at the later stages there was greater need to have time in order to elaborate the framework of cooperation. Furthermore, competition, at least in the beginning, was greater between the partners with similar interests such as, for example, competition between government agencies for political control and supervision, or between the technological service-providers for having priority access to R&D funding. It was very important to have the initial competition settled before any serious debate concerning the priorities of the action plan for the promotion of an Innovative Region Strategy. Once a balance had been achieved it was equally important to take the necessary measures in order to maintain the active participation of the partners. In the case of Central Macedonia RTP this was achieved through a constant flow of information and bilateral communication with the management unit playing the initiating or the catalyst role.

Clarifying the Meaning of Consensus

Despite the occasional ups and downs the forging of a consensus over priorities was a very demanding job, because in many cases the actual ground for concluding an agreement was not known in advance. As a result, consensus on particular issues was not always of the same quality nor had the same meaning for all the

different partners. For example, the different partners were not all equally interested on the issue of whether to support more generic and horizontal measures for business support or to focus on specific sectoral and/or geographical clusters. Even depending on the specific concerns of the particular persons representing the various institutional partners, they were more or less willing to agree on one or the other option. This situation was foreseen by the management unit, which attempted to contain such casual decision-making by the careful preparation of specialised reports, to the elaboration of which all key partners were invited to contribute. Another qualification of consensus stems from the fact that many partners do not object to any priority in so far as their own particular concern remains on the agenda. Thus, the trade unions were very much concerned with the maintenance of employment and the provision of retraining, and to the extent that the RTP was particularly sensitive to the employment impact of innovation no other issues triggered significant objections on their part. Finally, a different qualification to consensus relates to the ways in which each partner sees its own position in relation to the distribution of costs and benefits from the implementation of the RTP priorities. In this respect, consensus was facilitated by the fact that in most cases no immediate costs are apparent, as most decisions were concerned with the formulation of guidelines for the distribution of public resources, while the expected future benefits were made conditional upon the implementation of the specific priority projects. Thus, in both cases neither direct nor opportunity costs were clearly visible to the partners because they had to compete only over the allocation of potential future benefits.

Assessment of the Actually Existing Capacities

The detailed monitoring of the actually existing capacities for innovation in the region of Central Macedonia was perhaps one of the major contributions of the RTP. The detailed systematisation of demand and supply of technological services has revealed both a wide under-utilised potential and the existence of serious structural obstacles for its utilisation. Among these obstacles are the lack of a cooperative tradition in the business sector, the inadequate inter-firm networking and vertical and horizontal integration of the productive system, the weak linkages and the general mistrust between business, academics and public administration, the lack of self-confidence on endogenous capacities for the production of innovations, the clientelistic ethos in political decision-making, the inadequate expertise in the implementation of soft infrastructural projects, the wide availability of copied or cheap second-hand technologies, and the inadequate integration between the different regional centres. The management unit recognised the importance of such knowledge and took steps first to monitor and then to disseminate information about the features and the potential of the regional innovation system with the establishment of a Regional Technology Observatory, with plans to develop antennae at the Ministry of Macedonia and Thrace, the General Secretary and the seven prefectures of the region.

Management and Implementation

There is no doubt that the RTP experiment owes its successful completion to the collective effort of all the partners in the steering committee as well as to the personal commitment and professional competence of the great number of people involved at various stages in the preparation and dissemination of information about the evolution of the plan. The management unit had a decisive role in maintaining clarity and cohesion of the initial concept as well as in coordinating the involvement of partners and the deliverables of the many specialised working groups at each stage. A major asset for the project was the fact that political authority on the one hand and scientific expertise and economic control on the other have remained separate from the beginning to the end of the exercise. There were many instances where this separation has saved the project from many unnecessary complications. Of equal significance was the fact that the particular interest of the management unit, based at the University Department of Urban and Regional Planning and Development, in the RTP project was the success of the project itself. Furthermore, the composition of the steering committee guaranteed that practically all those interested in the promotion of regional innovation potential were represented by at least one member. The above practices of the management unit are the background for the continuation of the efforts to implement the priorities of the Action Plan. It is not possible to provide a more comprehensive assessment, as the implementation has just entered its initial phase.

In concluding we should stress that the actual achievement of the RTP in drawing up an Action Plan of development priorities on the basis of a general consensus among all the major partners involved in the promotion of the innovative potential of the region was a very satisfactory outcome. However, this positive assessment should be qualified, because this consensus was due partially to the fact that each partner had a particular interest in the implementation of the plan without always a clear synergy between the different priorities. This additive character of the plan should be seen as the cost of political consensus compensated for by the in-depth analysis of the strengths and weaknesses of the regional innovation system and the promotion of *projects fostering the innovative capacity and competitiveness of the regional enterprises*. To the extent that the implementation of the RTP priorities will proceed smoothly, there is no doubt that the plan will promote the effective use of new technology and the upgrading of the technological capacity of both the region's businesses and the research centres. On the other hand, the attempt to construct an Innovative Region Strategy for Central Macedonia has left many unfulfilled expectations, mainly because the plan has made explicit the existing deep structural gaps and deficiencies in the regional innovation system, some of which are due to the lack of motivation and knowledge and not to the inadequacy of available capital, material resources or infrastructure. Thus, the major challenge for a successful Innovative Region Strategy is not to imitate what other more advanced regions have achieved, nor to apply in a formal way theoretical models and policy-making recipes, but to prepare the

preconditions for a dynamic adaptation of the regional economy to a constantly changing international environment. That is, to make the region an innovative milieu of global significance.

NOTES

1. The authors wish to recognise the decisive contribution of Stamatis Tsiakiris, head of the European Programs Department of the Ministry of Macedonia and Thrace, with whom they shared the responsibility for the implementation of the RTP as members of its management unit. Nicos Komninos was the scientific coordinator of the RTP project while the Minister of Macedonia and Thrace (Constantinos Triaridis at the launching phase and Philippos Petsalnikos at the completion phase) had the political responsibility as head of the steering committee. Special thanks are due to Mr G Durand and Mr M Landabaso of DG XVI for their commitment to the success of the RTP initiative. Finally, the development of our own views and practices on regional innovation have been greatly enhanced by our cooperation with Kevin Morgan and Meirion Thomas, both of the University of Wales, who acted as consultants to the RTP of Central Macedonia.