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ON RESEARCH FOR THE WESTERN BALKAN COUNTRIES
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Science and Technology Country Report

ALBANIA

1 Introduction

This country report is produced by the "Information Office of the Steering Platform on Research for Western Balkan Countries" and reviews the situation of Science and Technology (S&T) in Albania.

The report summarises the main papers published by the United Nations Educational, Scientific and Cultural Organisation (UNESCO), the South-East European ERA-NET (SEE-ERA.NET), the Austrian Gesellschaft zur Förderung der Forschung, the Academy of Sciences of Albania and several independent scholars on the issue of S&T in Albania. For the complete table of references please see References in chapter 7, starting on page 47 of this report.

> The objective of this study is to enhance our understanding of the national innovation system in Albania. An overview of the situation in S&T regarding the main stakeholders, input and output indicators, the national strategies and priorities, and the main documents and laws in the field is given below.

The 'system of innovation' approach was taken into account when compiling this report, and it covers important factors influencing the development, diffusion and the use of innovations, as well as the relations between these factors. It does not place emphasis on individual firms or research organisations, but rather on innovation as an interactive and interdependent process.

Relevant organisations in this respect are higher education institutions, scientific institutes and centres, governmental agencies, private companies etc., interacting to create knowledge and innovation. The macro-level of the system is analysed using indicators such as R&D personnel ratios, R&D expenditure, patent application intensity rates, etc.

The report was compiled in autumn 2006 by the Information Office, by Ms. Elke Dall and Ms. Maruška Bračić, Centre for Social Innovation, Vienna, Austria and then reviewed by Mr. Peter Mayr, Centre for Social Innovation, and Mr. Edmond Agolli, Ministry of Education and Science, Albania. A brief update was carried out in summer 2007 by Mr. Jure Zrilič, Centre for Social Innovation. The final review in autumn 2007 was carried out by Mr. Gjergji Gjinko, Ministry of Education and Science and Mr. Salvator Bushati, Academy of Science, Albania.

1.1 Albania - A Brief Profile

Albania lags significantly behind its Balkan neighbours in the transition towards a modern, open-market economy. The transition has proven difficult as successive governments have tried to deal with high unemployment, widespread corruption, a dilapidated infrastructure, powerful organised crime networks and a disruptive political environment. The 1992 elections in Albania ended 47 years of communist rule under Enver Hoxha, although the latter half of the decade saw a quick turnover of presidents and prime ministers. Although the country has made progress in its democratic development since 1991, deficiencies still remain. During the NATO bombing of Yugoslavia in 1999, nearly 500,000 ethnic Albanian refugees from Kosovo spilled over the border, imposing a huge burden on Albania's already fragile economy. Despite continuous economic growth, the country remains one of the poorest in Europe, hampered by a large informal economy and an inadequate energy and transportation infrastructure (European Commission, 2006a).

The Republic of Albania is a South Eastern European country with a population of 3.2

million inhabitants (44% urban and 56% rural). The administrative division of the country consists of 12 prefectures, 36 districts and 374 communes/municipalities. In 1998, a new constitution was adopted to replace the interim constitution of 1991. The new constitution conforms to international democratic standards and guarantees democratic freedom, notably political pluralism, freedom of expression and religion. Albania is a parliamentary republic and the last parliamentary elections took place in July-August 2005 (the next elections are scheduled for mid-2009). Overall, the parliament functions satisfactorily, although political life in Albania continues to be turbulent. In terms of foreign relations, Albania has played a positive and constructive role in regional issues, particularly regarding Kosovo, southern Serbia, the Former Yugoslav Republic (FYR) of Macedonia and Montenegro. Albania participates actively in several regional cooperation activities and is also a party to most international human rights treaties. In 2000, the country abolished the use of the death penalty in peacetime (European Commission, 2006a).

In 2003, the nominal GDP of Albania reached EUR 7.4 billion (about EUR 2,300 GDP per capita) and 25% of the population were living below the country-specific poverty level. However, Albania's cumulative growth has reached an annual average of 5.7% due to the implementation of largely successful stabilisation programmes, structural transformation and remittances sent home by migrants. Agriculture has declined to 25% of GDP, industry and construction account for 23.4%, while the contribution of the service sector to GDP has risen to 54.6%. The economic situation was exacerbated by the continued weak export performance, which has resulted in a persistent external deficit (European Commission, 2006a).

Agriculture, which accounts for about one quarter of GDP, is held back because of frequent drought, the need to modernise equipment, clarify property rights etc. Furthermore, energy shortages and inadequate infrastructure contribute to Albania's poor business environment, making it difficult to attract and sustain foreign investment (CIA, 2006).

In 2004 and 2005 the real GDP growth rate was 5.5% while in 2006 5.7%. Unemployment in Albania is high, though not as high as in BiH or FYR of Macedonia. Unemployment rate in 2004 was 14.4%, 15,2% in 2005 and even smaller in 2006 - 14% (OECD, 2006). The privatisation of SMEs has been completed, but political uncertainty and the low level of interest from strategic investors have delayed large scale privatisation. Regarding the macroeconomic situation, 2004 tax revenues were projected to increase to 20.2% of GDP, but they remain the lowest in the region. However, on a more positive note, the absence of substantial inflationary pressure and the continuing nominal appreciation of the Lek (Albanian national currency) presented the opportunity for the relaxation of monetary policy (European Commission, 2006a).

Table 1.1: Country Profile 2005 [1]

Country Profile, 2005	
Population (millions)	3.2
Population growth (annual %)	0.6
Life expectancy at birth, female (years)	78.5
Life expectancy at birth, male (years)	72.6
GDP (current US$) (billions)	8.38
GNI per Capita, Atlas method (Current Euro)	2.580
GDP growth (annual %)	5.5
GDP implicit price deflator (annual % growth)	1.8
GERD as % of GDP (2005)	0.19

[1] Source: World Development Indicators 2006

Value added in agriculture (% of GDP)	22
Value added in industry + Construction (% of GDP)	23.4
Value added in services (% of GDP)	54.6
Inflation, consumer price (annual %)	2.4
Foreign direct investment, net inflows (% of GDP)	3.1
Unemployment, total (total labour force)	15.2
Time required to start a business (days)	41
Internet users (per 1000 people)	60

1.2 Relations between Albania and the EU

Albania participates in the Stabilisation and Association Process (SAP) along with other countries of the Western Balkans. In 2005, the European Council adopted a revised European Partnership for Albania, identifying short and medium term priorities which the country should address. The partnership also serves as a checklist against which to measure progress, as well as providing guidance for EC assistance. The EC priorities reflect Albania's stage of development and are tailored to its specific needs. Albania is expected to respond to the European Partnership by producing a National Action Plan with a timetable and details of how it intends to address the European Partnership's priorities. Progress in implementing these priorities is monitored regularly by the European Commission, notably through the annual Progress Reports and through other structures set up under the SAP, in particular the Consultative Task Force (European Commission, 2006a).

The signing of the Stabilisation and Association Agreement (SAA) in Luxemburg on 12th June 2006 is considered a milestone on Albania's path towards EU membership. It outlines a set of political and economic criteria that the government is expected to meet. The deal also clears the way for greater trade liberalisation and a more competitive market that will both challenge Albanian business and present new opportunities. Ratification of the SAA is expected to take about two years - eventually replacing the 1992 Trade, Commercial and Economic Cooperation and Interim agreements. The implementation of the SAA will also require Albania to progressively liberalise its market over a maximum period of 10 years (European Commission, 2006a).

Albania has benefited from national and regional financial assistance under the Community Assistance for Reconstruction, Development and Stabilisation (CARDS) programme and a far-reaching contractual relationship with the EU, including trade preferences through the Stabilisation and Association Agreement. Regional dialogue and cooperation are also important elements in gaining financial assistance (European Commission, 2006a). More than EUR 315 million were earmarked for Albania through CARDS between 2001 and 2006 (European Commission, 2006b). As a result of the Community's reform of external aid, the CARDS programme was replaced by the new Instrument for Pre-Accession Assistance (IPA) in 2007. The major objective of the IPA is to streamline all pre-accession assistance into a single framework, and to unite both candidate and potential candidate countries under the same regulations. The instrument consists of five components, the first two of which are open to potential candidate countries: the Transition Assistance and Institution Building component and the Cross-Border Co-operation component (European Commission, 2006a).

On 18th September 2007, the European Union (EU) and five West Balkan nations (among them Albania) signed nine agreements on visa facilitation and readmission, which will bring the two sides closer in cooperation in migration and movement of persons. The signature of the agreements is an important political decision toward closer cooperation between the

two sides closer in cooperation in migration and movement of persons. The signature of the agreements is an important political decision toward closer cooperation between the EU and the Western Balkan countries in the sensitive areas of migration and movement of persons (see-science.eu, 2007).

In the last fifteen years, Albanian society has reached a remarkable unity regarding the concept of Euro-Atlantic integration. Political parties, intellectuals, business people and citizens all agree on the need to join the European Union. However, little research or public debate has been carried out regarding the technical implications of this endeavour, possibly due to the sensitivity of the topic. The complexity of the process remains largely opaque both to policy-makers and to society (AIIS, 2006).

2 Contemporary Institutional Landscape

Albania has been undergoing radical changes and transitions since the dissolution of communism at the beginning of the 1990s. Although still comparatively isolated from international cooperative initiatives programmes and lacking adequate institutions and support structures.

There are currently four main elements in the Albanian national innovation system: government ministries, S&T institutes (each of which is associated with a ministry), S&T institutes and centres of ASA and the higher education sector. As Albanian industry develops, it will import technologies, initially associated with production equipment and processes, before adapting and developing its own technologies. In the public sector, foreign donors are major sources of finance for the purchase of technologies. Although many of the Albanian institutes run by government ministries describe themselves as research institutes, it appears that the bulk of their activities focus on scientific and technical services. Thus, the Albanian national system of innovation can be primarily defined as the S&T service system (as defined by UNESCO). Primary policy interest should consider S&T investment and measure S&T inputs and outputs (UNESCO/UNDP, 1996).

Further progress in the reorganisation of system of the scientific research, the creation of national research centres, the introduction of standards and performance indicators, and the improvement of the infrastructure and legal framework are absolutely necessary (Dall, 2006).

2.1 Main Stakeholders Involved in Policy Making in Albania

The main governmental body responsible for R&D activities and the general administration of Albanian national S&T programmes is the Ministry of Education and Science (MoES). The ministry's agenda is based on institutional and programme-based funding. It consults the government, aiming to act as an information point for the scientific community, and is responsible for national, multilateral, bilateral agreements programmes and other activities and actions. It also supports the implementation of S&T programmes in universities, ministries and other public and private institutions (Government of the Republic of Albania, 1994).

However, it must be noted that the responsible department is severely understaffed. The records up to 2006 show that, with agriculture being one of the most important sectors in the economy, the Ministry of Agriculture and Food is one of the main players in formulating scientific research policy in the national Agriculture and Food programme. The following ministries (often with research institutions attached) can also be considered as important

stakeholders in the Albanian national innovation system: the Ministry of Energy; the Ministry of Health; the Ministry of Culture, Youth and Sports; and the Ministry of Construction and Tourism (Gjinko, 2007).

The Albanian government acknowledged the need to amend existing laws and at the end of 2005, a group of experts was set up with the aim of defining and carrying out necessary changes in the innovation systems, including the creation of a Council of Higher Education and Science. The Council for Scientific Policy and Technological Development, which was composed of seven ministers and eight scientists, no longer exists and so the following duties actually are under the responsibility of the Council of Higher Education and Science: defining and managing S&T policy, approving orientations and priorities, making recommendations on draft laws and draft decisions to be submitted for consideration and approval by the People's Assembly and the Council of Ministers, carrying out the periodic evaluation of the achievements of the S&T policy, and so on. The Ministry of Education and Science itself is responsible for formulating S&T policy and national R&D programmes in order to implement this policy, drafting the budget proposal for S&T activities, and holding and distributing funds (ICBSS, 2006; Agolli, 2007a).

In March 2006, a conference on the Reform of the Albanian Higher Education System in the European Area was co-organised by the Council of Europe and the Albanian Ministry of Education. This was the opening conference for the Albanian master plan for higher education. The Albanian government has made the educational reform one of its top priorities - this comprehensive reform is supposed to be achieved through the elaboration of a master plan (Council of Europe, 2006).

Developments and trends in higher education in Europe, in particular within the Bologna Process (Albania acceded to the Bologna Process in September 2003) will be an important element in implementing the master plan, and the Council of Europe will provide the international expertise (Council of Europe, 2006). Far reaching reforms and the implementation of new laws should significantly contribute to the improvement of the existing situation in the field of higher education.

The main actors carrying out research and development projects have been: research institutes/centres of the Academy of Sciences; research institutes/centres, and scientific stations/incubators of ministries; higher education institutions; R&D units in the private sectors of industry, and NGO research institutes and research centres. Higher education and science are mostly treated separately, and PhD programmes are often disorganised.

Most of the Albanian R&D performance is concentrated in the centres and institutes under the auspices of the ministries, the Academy of Sciences (ASA), higher education institutions and the government sector, which together account for about 97% of R&D performance. In contrast, private sector R&D is marginal. There are no specific funds or agencies in Albania that are responsible for financing R&D activities - instead, a national competitive R&D programme operates on behalf of the ministry, and organises cooperative processes with the Academy of Sciences and other research institutions concerning priority setting for the national programme (ICBSS, 2006).

The Academy of Sciences (ASA) was founded in 1972 and represents the most prestigious and most important scientific institution in the Republic of Albania. The ASA is an independent institution, which includes 13 scientific institutions/centres within its system (half of which belong to the natural and technical section and the other half to the section of human and social sciences) (ICBSS, 2006). It performs studies and applied research in different

domains of Albanology, social, natural and technical sciences; assists in discovering new domains of studies and research; provides suggestions and necessary expertise to the higher government institutions in resolving problems considered as important for the country's development; promotes and encourages the active participation of associations, scientific foundations and outer collaborators in scientific activity, etc. (Agolli, 2007b). The publishing house *Shkenca* (Science) also plays an important role, especially in the publication activities of the ASA. Over 270 researchers work in the academy and its institutions: they create clear research programmes, closely linked to the actual problems of development in the country, and formulate clear procedures for planning, controlling and evaluating scientific activity (ICBSS, 2006).

Some institutions provide an important national contribution: for example, the Institute of Informatics and Applied Mathematics (INIMA) was formerly in charge of developing the LAN in all the institutions of the ASA (among others), and played a positive role in the creation of the National Academic Network (with its contribution to the Political Board and Technical Group of NAN). INIMA is a reference partner for international networking activities in this field. In recent years INIMA has been involved in several EU-funded projects, including SEEREN, SEE-GRID, and SEEFIRE[2] (TERENA, 2005).

24 other research institutes are under the authorities of the ministries. Research institutes within the Ministry of Education and Science ought to present a balanced combination of R&D activities, fulfilling an important role in the provision of services and monitoring activities in specific fields. The transformation process form an institutional system, designed to function in a centralised economy, to a system that functions in a market-economy represents a constant challenge. Regarding the financial aspects, the majority of these institutions mainly rely on the state budget, with little secondary income. The main part of the budget is destined for wages, leaving little for the provision of infrastructure. Unfortunately, not all of these institutes meet the required standards and the financial situation does not allow for the renewal of equipment. The institutes are often fragmented and lack qualified personnel, as well as clear and well oriented programmes operating under market-economy conditions (Gjinko, 2007).

In higher education institutions, the main R&D activities are carried out in Humanitarian, Economic, Social-juridical and Medical sciences, and in Natural and Technical sciences. They are mainly concentrated in the University of Tirana, the Polytechnic University of Tirana, the Agriculture University of Tirana, University of Vlora, the University of Shkodra, and partly in the University of Elbasan. The small share of R&D in the higher education sector is mainly due to the lack of direct financing. Hence, higher education institutions in Albania are mainly oriented towards teaching processes, while scientific research remains limited and is mainly possible through foreign cooperation initiatives (ICBSS, 2006; Agolli, 2007a). The University of Tirana, which was originally composed of ten faculties, was split up in 1991 when the engineering faculties were brought together under the Polytechnic University, leaving the University of Tirana with seven faculties covering Human, Economic, Natural and Medical sciences.

According to the National Report on Bologna Process, there are currently 12 public and 15 private universities in Albania. The total number of students for the academic year 2005-2006 was 52,283 (30,777 females), of these, 50,567 have enrolled in public universities; for the 2006-2007 was 86,178 (45,586 females), with 82,161 in public universities. All activity of the public and private higher education institutions have been managed by the same Law on Higher Education with the same standards about study plans, programmes and curricula for both private and public higher education institutions (Theodhori, 2006).

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[2] Please see the List of Acronyms, chapter 8.

Table 2.1: Enrolment in higher education institutions 2005-06 and 2006-07 (Gjinko, 2007)

	2005-2006		2006-2007	
	total	female	total	female
Total	52,283	30,777	86,178	45,586
Public	50,567	29,826	82,161	43,468
Non public	1,716	951	4,017	2,118

According the new Law on Higher Education in the Republic of Albania (more details are given in chapter 5.1 Legal Framework for National R&D System), the MoES develops the new scientific research system in Albania by reconstructing most of the existing research institutions in the universities (as institutions, centres and departments) and by introducing several new research institutions, these are: the Interuniversitary Centre for Albanological Studies, the Institute of Geosciences, the Institute of Water, Energy and Environment, the Centre of Nuclear Physics and the Albanian Atomic Authority.

Table 2.2: Main S&T Stakeholders in Albania (Dall, 2006; Sulstarova, 2006)

Main ministry in Albania competent for S&T	- Ministry of Education and Science
Other ministries with importance to the S&T sector	- Ministry of Agriculture and Food and Consumer Protection - Ministry of Economy, Energy and Trade - Ministry of Culture, Tourism Youth and Sports - Ministry of Health - Ministry of Environment, Forest and Water Administration - Ministry of Public Works, Transport and Communication - Ministry of Interior
Other important stakeholders	- Council of Higher Education and Science - Rectors Conference - The Academy of Sciences
Universities, Centres and Institutes	- Interuniversitary Centre for Albanological Studies - Polytechnic University of Tirana - Agriculture University of Tirana - University of Tirana - Centre of Nuclear Physics and Albanian Atomic Authority - Institute of Water, Energy and Environment - Institute of Geosciences - Military University of Tirana - University of Shkodra - University of Elbasan "Aleksander Xhuvani" - Agricultural University of Korce - University of Gjirokaster - Technological University of Vlore - University of Durres - Academy of Arts - Academy of Sports and Physical Training, Tirana - Institute of Statistics

The private sector's investment level in S&T in Albania is extremely low. SMEs, or rather micro-enterprises (entities with fewer than five employees), make up the vast majority of private businesses. Their survival strategy focuses on labour intensive, low-cost production. Against this background, R&D falls almost entirely under public responsibility (Xhepa and Mancellari, 2003). Overall, there are very few private institutions, and these few operate mostly in the field of Human, Social and Political sciences but their personnel structures and their financial and cooperation procedures are not stable. However, in the field of information technology, the private sector became dominant by establishing market activities with some relevance to research and development (ICBSS, 2006).

The Centre for Research and Development in Tirana is a private research institute worth referencing. Since early 2002, it has produced and disseminated information about business development based on quarterly business tendency surveys for manufacturing and construction sectors. It is becoming well recognised by Albanian institutions, international organisations and is frequently referred by journalists and academics as a source of information regarding business development in Albania (Gajo, 2007).

2.2 International Cooperation

Albania has been experiencing continuous international cooperation and support, especially in the last five years. This cooperation has been substantially supported by many international organisations, as well as through the assistance of other countries in bilateral programmes (also providing significant benefits to the R&D sector). The largest part of the financial support in this respect came from the funds of the Stabilisation and Association Process, the CARDS programme, the Stability Pact for South Eastern Europe[3], the European Investment Bank, and the European Bank for Reconstruction and Development. The European Union's Tempus programme has been important in the area of higher education, while Albania's participation in the Framework Programmes for R&D and gradual integration into the European Research Area (ERA) has also been of particular importance. Inclusion into the European Investment Bank's Innovation 2010 Initiative ought to prove useful as well. Regarding multilateral cooperation in the area of science and research, Albania has closely cooperated with many specialised United Nations (UN) agencies, such as UNESCO, UNIDO, UNDP and UNECE[4]. Some other international organisations, such as the World Bank, have also been important donors and have helped in the area of R&D (Uvalic, 2006). In addition, many regional projects have been launched with the objective of promoting regional cooperation within South Eastern Europe. Regional scientific cooperation in Albania is currently being promoted by several regional organisations: for example, the Central European Initiative (CEI), the Adriatic-Ionian Initiative, the Stability Pact for South Eastern Europe, the Black-Sea Economic Co-operation (BSEC), and the International Atomic Energy Agency (IAEA).

Albania has participated in FP6 as a so-called third country. Albanian participants were involved in 17 projects within FP6 and mostly were active in "Specific measures and support of international cooperation" and "Information Society Technologies" (Ministry of Education and Science, 2006).

Albania's Minister of Education and Science Genc Pollo and EU Commissioner Janez

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[3] On 8th May 2007 a summit on recent achievements in regional cooperation in South Eastern Europe was organised in Zagreb. The Stability Pact is transferring its responsibilities to locally managed bodies based in the region. The Zagreb Summit of the South-East Europe Cooperation Process (SEECP) and the Stability Pact Regional Table is an important step in this process. The European Commission fully supports this transfer of ownership to the local level and cooperates closely with the Stability Pact, the SEECP and other stakeholders to that end. A Regional Co-operational Council, which will become operational in 2008, will gradually assume the responsibilities of the Stability Pact for South Eastern Europe and the SEECP (Southeast European Times, 2007).
[4] Please see the List of Acronyms, chapter 8.

Potočnik signed the Memorandum of Understanding (MoU) with the European Commission allowing it full participation in the EU's Seventh Research Framework Programme (FP7) in Brussels on 17th December 2007. "Associated status" allows Albania to participate in all calls for proposals and compete on an equal footing with the EU Member States for research co-operation and support actions funded by FP7, as of 1st January 2008. As such, this agreement is an important part of the process of applying to join the EU, allowing scientists, universities and companies to create links with their counterparts across Europe and build up their scientific expertise, including in scientific fields crucial to implementing the body of EU legislation. Albania now joins the other countries in the Western Balkans regions that are associated to FP7.

Regional networks also include initiatives to aid the participation of Western Balkan countries in the EU Framework Programmes for R&D, as defined by the EU-Balkan Countries Action Plan on Science & Technology, adopted at the Ministerial Conference in Thessaloniki on 26th-27th June 2003. The Action Plan, along with the "Shared Vision", defined the priorities of research cooperation and provided a detailed examination of all possible sources of funding, thus contributing to the economic growth of Balkan countries and aiding their integration into the European Research and Innovation Area (CORDIS, 2003).

Although the Albanian Ministry of Foreign Affairs (MFA) has certain responsibilities in the field of international co-operation, it is the Ministry of Education and Science (MoES) which has full autonomy and responsibility for international R&D co-operation, especially concerning negotiations with partners in S&T institutions, contracting the framework for international bilateral and multilateral S&T cooperation and financing those activities which are selected and approved by the ministry. The MoES is a member of the SEE-ERA.NET project (South-East European ERA-NET) - a networking project funded in FP6 aimed at integrating the EU member states and the South Eastern European countries into the European Research Area by linking research activities within existing national, bilateral and regional RTD programmes as well as in the WBC-INCO.NET project funded in FP7 focussing on cooperation in science policy with the Western Balkan countries. ERA WESTBALKAN+ (FP6) is another project worth mentioning with participation from MoES. On the other hand, the Academy of Science (ASA) has full autonomy and responsibility regarding international R&D cooperation (in terms of negotiation with partners in international and national S&T institutions). It also has the right to negotiate with international organisations like the WMO (World Meteorological Organisation), the IAEA (International Atomic Energy Agency), the CTBTO (Comprehensive Nuclear-Test-Ban Treaty Organisation), the BSEC (Black Sea Economic Co-operation), UNESCO-ROSTE Venice etc., upon the permission of the Albanian Ministry of Foreign Affairs (ICBSS, 2006).

In the ICT field, there are Albanian institutes participating in various international scientific projects, such as TERENA (Trans-European Research and Education Network Association), SEEREN and SEEREN2 (South Eastern European Research & Education Network - INIMA with the Polytechnic University of Tirana and the Faculty of Economics of the University of Tirana), SEE-GRID and SEE-GRID2 (South Eastern European Grid-enabled e-Infrastructure Development), SEEFIRE (South-East Europe Fibre Infrastructure for Research and Education), ISOTEIA (Integrated System for the promotion of Territorial-Environmental Impact Assessment in the frame of spatial development) (INIMA, 2006).

Albania also participates in the IDEALIST7FP Network which supports participants in ICT Priority by network for IST under the transition to the 7th Framework Programme (funded in FP6). IS2WEB is a project co-ordinating the integration of scientists into the IST (Information Society Technologies) Programme of the FP6 and SEE-INNOVATION (focusing on the integration of SMEs in the field). The projects are funded by the European Commission

and assist innovative research organisations and SMEs in Western Balkan countries in getting informed about, and actively participating in, IST research funded by the European Commission. Furthermore, SCORE (Strengthening the Strategic Cooperation between the EU and Western Balkan Region in the field of ICT Research) is relevant in this field. Civet 2000, a private NGO is a partner of these projects in Albania[5].

Further projects with participation from Albanian institutions in FP6 are (European Commission, 2007):

- DAFNE-WBC (The use of household budget survey data as a tool for nutrition interventions in the post-conflict Western Balkan countries? the European Data Food Networking (DAFNE) approach)
- RECOVER (Renewable Energy COordinated DeVElopment in the Western Balkan Region)
- CSCAMHPPEI (Cultural Sensitivity and Competence in Adolescent Mental Health Promotion, Prevention and Early Intervention)
- ACCENT (Acceleration of the Cost-Competitive Biomass Use for Energy Purposes in the Western Balkan Countries)
- HECTOR (Eating Out: Habits, Determinants and Recommendations for Consumers and the European Catering Sector)
- SEADATANET (SEADATANET - A Pan-European Infrastructure for ocean and Marine Data Management)
- BAFN (Setting up of an agricultural and food research network in the Western Balkan Countries)
- EU-BALKAN-FABNET (EU-Western Balkans network for training and the promotion of cooperation in research activities within the Food, Agriculture and Biotechnology area of FP7)
- HUMSEC (Human Security in the Western Balkan region: the impact of transnational terrorist and criminal organisations on the peace-building process of the region)
- RETEXRESALB (Reinforcement of human and material capacities of the Textile Technology Research Centre in Albania)
- TRAINASA (Training Programme on International Research Project Development and Management for Young Scientists from the Academy of Sciences of Albania (ASA))
- SWEB (Secure, interoperable, cross border m-services contributing towards a trustful European cooperation with the non-EU member Western Balkan countries)
- WEB.DEP (Western Balkans Democratic Participation)
- RACWEB (Risk Assessment for Customs in Western Balkans)
- ELLECTRA-WEB (European Electronic Public Procurement Application Framework in the Western Balkan Region)
- BIOMERCURY (Worldwide remediation of mercury hazards through biotechnology)
- IMISCOE (International Migration, Integration and Social Cohesion in Europe)
- CALIMERA (Cultural Applications: Local Institutions Mediating Electronic Resource Access)
- TRABOREMA (Concepts for integrated transboundary water management and sustainable socio-economic development in the cross border region of Albania, Former Yugoslav Republic of Macedonia (FYROM) and Greece)
- RES INTEGRATION (Rural Sustainable Development through Integration of Renewable Energy Technologies in Poor European Regions)

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[5] See such websites as: http://www.ideal-ist.net/, http://www.ist-world.org/ProjectDetails.aspx?ProjectId=e26b1aff3fe1432b8aa8e2c071c0d 89e, http://www.score-project.eu/ and http://www.civet2000.com/ as accessed 26.03.2008.

- INTAILRISK (Assessment of Environmental Risk for Use of Radioactively Contaminated Industrial Tailings)
- WEB-ENV (Development of environmental guidelines for the region of Western Balkans)
- INDUWASTE (Management and remediation of hazardous industrial wastes in the Western Balkan Countries)
- WEB-MOB (Development of Researchers Mobility Policy Guidelines for the Region of Western Balkans)
- WYP2005 EUROPE (World Year of Physics 2005: Activities in Europe)

Albania also takes part in the Bologna Process. Albania signed the Bologna Declaration during the Berlin conference in 2003. From 2003 to 2005 several acts and orders were amended by the Parliament and the Ministry of Education and Science in order to implement the Bologna Declaration, including the study cycles, academic standards in higher education, teaching load, financial autonomy, and university admissions procedures. Tempus projects helped the higher education institutions to fit to the Bologna process requirements (European Commission, 2005).

Bilateral cooperation in Albania is based on competitive funding for joint research projects. The MoES supports these projects, the main goals of which are research, development and innovation based on the priorities of the national R&D programmes. Albania maintains bilateral inter-governmental cooperation in the area of R&D, mainly with Greece and Italy, FYR of Macedonia, and Slovenia. Over 80 projects were agreed with Greece in S&T cooperation between 2001 and 2006, and over 100 have been co-developed with Italy between 2002 and 2004. With the FYR of Macedonia and Slovenia, bilateral inter-governmental co-operation was running with six joint projects per country in 2006 (Agolli, 2007a). The operative priorities of such international agreements include: cultural heritage, environment, health sciences, seismology, transport networks, telecommunications, public health, economy, technological innovation, agronomy and biotechnology. Furthermore, the negotiations for bilateral cooperation with Austria and Turkey are ongoing (ICBSS, 2006). Albanian R&D institutions also participate in multilateral programmes - focusing especially on EU and UN programmes, but also in the national and regional (Balkan and Eastern Mediterranean region) programmes.

A group of Albanian academics and analysts with extensive experience on foreign policy and policy-making issues have established the Albanian Institute for International Studies (AIIS), a non-governmental, non-profit making research and policy institute, which has become the leading think-tank supporting Albanian policy makers and international partners in the fields of security studies, democracy, Euro-Atlantic integration and regional cooperation. Regarding Euro-Atlantic integration, the AIIS undertakes research, organises international conferences, conducts broad-based projects and publishes its findings and recommendations. The institute's dedication to Albania's integration into NATO and the European Union will continue to be pragmatic and focused on the realities of integration, including efforts in dismantling false perceptions surrounding the integration issue. In 2005, the AIIS established an independent research centre (AIIS - Centre for European Studies), focusing on contemporary issues of the EU policy debate. The centre's mission is to facilitate and contribute to Albania's EU integration process by providing the relevant expertise and assistance to the policy-making community. Furthermore, the institute also set up a European Programme in 2005. AIIS projects place emphasis on increasing public awareness and strengthening knowledge concerning the European integration process and the European Union; providing expertise and know-how to policy makers; and strengthening Albania's capacities to face the challenges of the Stabilisation and Association Process (SAP). The institute also publishes a monthly

review called *EUROPA* - a contribution towards the Europeanisation of Albanian society, emphasising the future challenges and opportunities presented by the SAP (AIIS, 2006).

3 The Input Side of the National Innovation Systems

Regarding the input indicators for the S&T system, some questions (e.g. the amounts spent in terms of the gross domestic product (GDP), volumes, growth rates etc.) need to be addressed. Here a distinction is made between private and public investment. R&D investment can be considered as an indirect measure of a country's innovation capacity (Fischer, 2006).

3.1 Development of Financial Resources Allocated to R&D

The National Statistical Office of Albania (INSTAT) has not yet released official statistics according to the standards of the OECD Frascati manual for R&D funding and performance. Government expenditures on R&D in Albania account for approximately 85% of the expenditure of research institutions (ICBSS, 2006).

The data in the table below regarding government expenditure on R&D shows that GDP during the 1996 to 2003 period was very low. After the deep financial and social crises that were a result of the collapse of the pyramid schemes in 1997, expenditure increased to 0.19% of GDP in 1998. During the Kosovo crisis in March 1999, the value of R&D expenditure/GDP was 0.11. Since 2000, the values have increased very slowly, a trend which will hopefully continue.

Table 3.1 R&D expenditure as a percentage share of GDP and as the annual rate from 1997-2003 (Agolli, 2007b)

Indicator	1996	1997	1998	1999	2000	2001	2002	2003	2005
As % of GDP	0.17	0.14	0.19	0.11	0.17	0.18	0.18	0.18	0.19
As annual rate by years		84.03	169.45	67.7	177.5	112.58	106.3	107.87	

The Ministry of Education and Science reported that total expenditure for research institutions in 2004 reached EUR 2.4 million. In 2005, R&D state funding still remained low at approximately 0.2% of GDP (INA - Great-IST, 2007).

The state budget finances R&D activities in Albania in two complementary ways: via funding institutions and via national R&D programmes. The institutional financing goes directly to central organisations in order to support the R&D activities of their dependent institutions. As for financing through R&D programmes, this is conducted using (ICBSS, 2006) the state budget, which is designated for national R&D programmes (see chapter 5.3). It is used to finance different projects in the priority areas in a competitive way through the MoES, following established and standard procedures, especially for international cooperation

There is hardly any current data available on the private sector (1997-2003). The level of investment in S&T was still too low to draw any substantive conclusions; despite its current difficulties and serious economical issues, some experts have been rather optimistic about Albania's future development, especially taking into consideration its proximity to European markets and innovative abilities of its people. Anyhow, step by step, the changing situation is optimistic for the R&D in Albania.

With the ongoing EU integration of Albania into the international community and donations provided by the World Bank and the European Commission for economic restructuring, a consolidation of R&D activities may be expected (ICBSS, 2006).

3.2 R&D Infrastructure

According to Uvalić, the overall state of R&D infrastructure in Albania is not very satisfactory. At the time of writing this report, there were still no research centres at the local or regional level, nor new technologies or innovation parks. The technology and technical research equipment has improved in recent years, but is still insufficient. In some institutions of ASA there are a lot of new scientific environments (for example, Institute of Nuclear Physics, Institute of Biological Researches, Institute of Hydrometeorology and Institute of Seismology). The communication and information infrastructure, the network access for higher education and research institutes, and the library information systems are highly inadequate and there is almost no access to electronic journals (except some incentives of ASA since 2004 to the CEEOL) and Science Citation Index databases (Thomson) (Uvalic, 2006). In the recent years the Government has become more sensitive to the need to ameliorate the situation.

There are also some private or non-profit making organisations offering and developing internet services (for example, Adanet, Albaniaonline, ICC, StarSat, Abissnet, SUN etc.). The MoES and the ASA have jointly set up a procedure to establish the Albanian Academic Network (AAN), which would be in charge of the national research and education network. At the time of writing this report, the network was still in a preliminary phase and did not cover all the research institutions and centres, higher education institutions, and other important stakeholders for S&T sector in Albania. Gradually, LAN networks for every institute/centre within the ASA system were created, and the internet services now work regularly (ICBSS, 2006).

The Albanian government built up the Information Society Agency. The mission and the objectives of this institution are:

- establishment and monitoring of ICT common standards on a national scale
- development of the modern platform of e-government for the public administration
- coordination of the major projects of ICT in central and local level, by avoiding duplications and increasing the efficiency of the funds' use
- development of common components of ICT in use by the government
- update and monitoring of strategies and national policies implementation by the Information Society in Albania
- highlighting of the recommendations serving for the implementation in the information society of strategies and policies. This included recommendations on rules of procedure and laws
- enhancement and facilitation of ICT spread in government's local services (E-Local Government) aiming to make easier citizens daily life
- reforming and modernisation of the public services, focusing the citizen (citizen-centred)
- organisation of the public private partnership (PPP) for the development and implementation of the strategies and plans of the information society
- evaluation and the suggestion of the budget needed for the implementation of the different stages of the national strategies
- offering maximum transparency in governing through ICT and E-Government in order to prevent corruption and increase public administration prestige
- infrastructure establishment offering information free access to the public

- integration of the Albanian society in the European and world structures of the Society of Information, and the coordination of the projects in European and local levels
- preparation of the necessary steps for the European integration through the adaptation of the electronic legislation and the set up of useful infrastructure.

Taking into consideration the main duties and objectives set out by the Civil Society Information Agency, a national project can be implemented by this Agency.

Albania has a very low internet penetration while the ICT facilities are concentrated in the state capital. The government should also follow through with the initiative of establishing a high-speed internet network between various governmental institutions, as well as a network of Public Access Centres (PACs) in rural areas of the country, to inform Albanians of information and communication technology benefits as well as provide access to modern services (SBRA-Great-IST, 2007). To allow the R&D infrastructure capacity of education and sciences in universities, the government invested EUR 1.6 million in 2007 (Agolli, 2007b).

3.3 Human Resources in R&D

The human capital invested in a nation's S&T effort is as important as the financial resources devoted to the programme. The level of financial resources available for the national S&T programme usually sets the level of demand for human capital, but factors affecting the supply (such as university and technical school enrolments) are often unconnected to demand, leading to shortfalls or overabundance (UNESCO/UNDP, 1996). According to the most recent UNDP ranking for 2007/2008, Albania has a human development index value of 0.801, ranking 68th out of 177 countries. This ranking encompasses a life expectancy at birth of 76.2 years, an adult literacy rate of 98.7%, a combined primary, secondary and tertiary gross enrolment ratio of 68.6% and a GDP per capita of US$ 5,316 (UNDP, 2007). However, merely by not providing the number of researchers in R&D per million, the same report indicates the lack of these researchers in Albania.

Albania faces a distinct lack of human resources that would be able to undertake scientific research work, since the country has been severely affected by brain drain. The education system is poor and it ought to be a major priority to restructure and enrich it in order to build human capacity for the future (INA -Great-IST, 2007).

As stated already, most of the Albanian R&D performance is concentrated in ministerial institutes and centres, the Academy of Sciences, higher education institutions and the government sector, which together account for about 97% of R&D performance. Only a small percentage is developed by the private sector: companies, institutes/centres, non-profit organisations, which can be explained by an organisational allocation of the research institutes respectively to the ministries, the ASA, universities and private organisations. With regard to public R&D, the Academy of Sciences accounts for the highest share of scientific activity. Official human resource statistics in Albania for R&D employees and researchers do not equate to Full Time Equivalents (FTE) as defined in the OECD's Frascati manual. In the higher education sector in particular, researchers are only partly engaged in R&D activities and from 1990 onwards the level of human resources engaged in S&T decreased drastically (ICBSS, 2006).

Figure 3.1: R&D Personnel by Scientific Disciplines and Sectors of Employment (2003) (ICBSS, 2006)
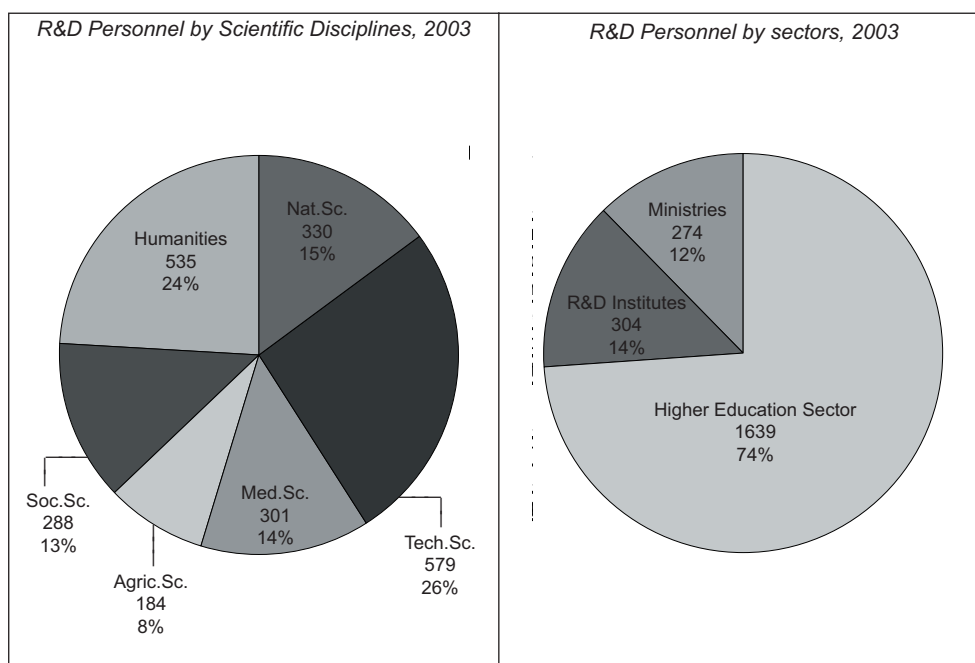
The distribution of researchers by scientific discipline shows that almost 40% of researchers in Albania are found in Natural and Technical sciences, 14% in Medical sciences and around 8% in Agricultural sciences. Scientific personnel are numerous in higher education institutions, although they make little contribution to the R&D sector, highlighting the urgent need for changes in the research system. Research personnel from the Natural and Technical sciences, Medical sciences, Agricultural sciences, Social sciences and Humanities contributed to the shift of researchers from research institutes to the higher education sector, taking employment as the external staff of the public and private education sector (over 1,800 persons in the last decade). Around 120 scientists from the Academy of Sciences contribute to the country's higher education institutions. Generally, the quality of the science system is considered much higher than the level of the economy would suggest. One reason for this can be found in the sufficient supply of human capital, which exists despite the severe brain drain problems. Although the level of higher education has decreased and facilities have not yet been modernised, the education system seems to be capable of supplying a sufficiently large base of scientists to keep up the status of the science sector. However, there are severe difficulties in providing highly qualified graduates on a broad basis. Moreover, the ongoing process of emigration of the most highly educated people poses additional threats for the human capital basis (ICBSS, 2006).

Various surveys have shown that approximately 40% of professors and research scientists from the higher education institutions and science institutions in the country emigrated between 1990 and 1999. Furthermore, this exodus seems to be increasing, with even more highly educated people wanting to emigrate as shown by a 1998 survey. Another survey (1999) revealed that of 300 academics, who had obtained PhDs in the West during the 1980s and 1990s, 67% had emigrated. The emigration of the highly educated elite began with the

implementation of economic reforms, which resulted in hardship for the population and, above all, a reduction of real wages. Emigrants include highly educated and qualified people from all industrial sectors and scientific disciplines, mostly young males: 51% of emigrants are under 40 years old and 67% of them are male. However, many of the highly educated people who have gone abroad do not work in their area of specialisation, creating a considerable level of "brain-waste". For example, data from the 1998 survey reveal that about 74% of Albanians in Greece do not work in their previous area of activity. In Italy, this figure drops to 67%, in Austria to 58% and in the USA to 70% (ICBSS, 2006).

After the collapse of communism, thousands of young people left the country to study abroad - this contingent of Albanian society, which is exposed to Western methodology and practice, especially in the field of science, is in a position to revitalise Albanian institutions and provide fresh impetus into social, economical and political life. However, the continuous brain drain which is driven by the deteriorated economic living conditions, the lack of state-of-the-art infrastructure and funding (constituting serious obstacles for research) and restrictive visa regulations (hindering scientific exchange and temporary employment abroad) poses a severe threat to the Albanian social system (ICBSS, 2006).

The experience of other countries shows that about half of the students and scientists return to their home country after a period of time abroad, which means not only knowledge transfers but also a gain of human capital that may not have been developed had the students and scientists stayed in Albania. If it is assumed that only 20% of the Albanian students studied actually abroad will return during the next 10-15 years, the potential in terms of human capital for a small country like Albania is enormous. An influx of 4,000-5,000 professionals with university degrees from Western countries is expected to eventually contribute to a brain gain for Albania (Tafaj, 2003).

A joint UNESCO/Hewlett Packard (HP) project on piloting solutions for alleviating regional brain drain was implemented in 2003 in several Southeast European countries, including Albania. By providing resources, including technological and financial facilities, to various universities, the initiative has enabled young scientists from the region to work within the framework of joint research projects with their fellow-nationals living abroad. The project has provided grid technology to various universities from Albania, BiH, Croatia, the FYR of Macedonia, Serbia and Montenegro. The grid project was extended in April 2005 to include two new universities - the Polytechnic University of Tirana and the Ss. Cyril and Methodius University in Skopje. At the regional level, regular project meetings have also acted as a stimulus for transcending boundaries. Not only has the project strengthened scientific and educational capacities at the national level, it has re-established dialogue among young researchers from the region after years of broken communication. The networks created with UNSECO/HP support function autonomously, with the objective of sharing innovative experiences to help researchers from the region consolidate local capacities and undertake research beyond borders, without leaving their home countries permanently (Preda, 2007).

However, despite the aforementioned difficulties caused by brain drain throughout the 1990s, the number of R&D personnel gradually started to increase in 1996, and an upward trend has been present in practically all scientific disciplines ever since (see Table 3.2). Similarly, there was an increase in the number of doctors in R&D between 1996 and 2003, the increase being particularly marked in scientific fields such as Engineering, Medical science, and Social science (see Table 3.3).[6] The importance of young researchers in R&D has also increased in practically all scientific disciplines, but the most numerous, are young researchers in medical science (more than 50% of the total) (see Table 3.4). The number of professors and assistant

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[6] The figures in these tables are not directly comparable, since some refer to part-time and others to full-time work.

professors has also increased, again in all disciplines (see Table 3.5).

Table 3.2: R&D Personnel (data is valid for the Higher Education sector) (Uvalic, 2006)

	1996	1997	1998	1999	2000	2001	2002	2003
Natural sciences, mathematics	20	25	27	30	32	34	35	37
Technical sciences	23	24	27	30	34	34	36	38
Medical sciences	45	48	48	50	53	55	57	60
Social sciences	31	34	36	38	39	39	40	42
Humanistic sciences	45	46	47	50	53	57	60	62
Total	**164**	**177**	**185**	**195**	**211**	**219**	**228**	**239**

Table 3.3: Number of Doctors in R&D by Scientific Field (data is valid for the Higher Education sector) (Uvalic, 2006)

	1996	1997	1998	1999	2000	2001	2002	2003
Natural science	72	77	76	86	91	96	100	105
Engineering	26	31	33	37	39	42	46	50
Medical science	27	30	34	38	41	45	49	51
Social science	16	19	22	25	28	31	33	36
Humanities	21	23	25	28	30	32	34	35
Total	**162**	**180**	**190**	**214**	**229**	**246**	**262**	**277**

Table 3.4: Number of Young Researchers in R&D by Scientific Fields (data is valid for the Higher Education sector) (Uvalic, 2006)

	1996	1997	1998	1999	2000	2001	2002	2003
Natural science	15	18	21	24	26	29	31	33
Engineering	12	13	13	14	14	15	15	17
Medical science	100	107	109	111	114	116	118	119
Social science	14	15	15	15	16	16	18	19
Humanities	13	14	14	16	17	17	18	18
Total	**154**	**167**	**172**	**180**	**187**	**193**	**200**	**206**

Table 3.5: Number of Professors and Assistant Professors, by Scientific Field (data is valid for the Higher Education sector) (Uvalic, 2006)

	1996	1997	1998	1999	2000	2001	2002	2003
Natural science	54	62	66	70	73	79	86	92
Engineering	26	29	31	33	36	38	39	41
Medical science	52	56	59	65	69	75	80	88
Social science	13	15	17	19	23	28	31	36
Humanities	52	59	65	69	77	79	85	91
Total	**197**	**221**	**230**	**256**	**278**	**299**	**321**	**348**

In accordance with the prioritisation of the development strategy for the education and sciences, the Albanian government is taking a lot of measures to ameliorate the R&D human resources situation.

The Government of Albania has placed high priority on the issue of human capital. Directly related to this priority is the process of reversing the phenomenon of brain drain. The return of qualified migrants has been identified as a key policy in the government's Strategy for Migration to achieve an effective engagement of the Albanian diaspora in development processes. Following a request of the Government, UNDP facilitated the preparation of a programme for greater engagement of the diaspora in Albania's socio-economic development based partly on the lessons learned and experience of various organisations (UNDP Albania, 2006).

The objective of the project is to support the creation of the necessary incentives and national policy mechanisms to effectively engage the Albanian Diaspora in the scientific, administrative and economic development of the country. Over its two-year duration the project will seek to reverse Albania's brain drain. The project will support the Government in the preparation of a policy framework for the above processes. It will also establish an online database to match the demand of Albania's academic institutions, public administration, and private sector with the expertise offered by the Albanian diaspora (UNDP, 2006).

Table 3.6: Estimated Project Budget (in USD) (UNDP Albania, 2006)

Budget Items	Amount
Project set up and public awareness	50,000
Expatriate Knowledge Transfer Initiative	700,000
Internship Scheme	100,000
Academic Scheme	100,000
Support to Diaspora Institute	50,000
Project Total	**1,000,000**
UNDP Contribution	300,000
Donor Funding Sought	**700,000**

The main result of the project will be to establish an enabling environment for highly skilled Albanian expatriates to contribute to Albania's progress and development. Albania's future success and competitiveness are closely linked with the establishment of an enabling environment within the country for skilled individuals to give their contribution. It is equally important to acknowledge the fact that the process of bringing back qualified Albanians cannot be achieved through short or medium term interventions. The involvement of the diaspora requires a great vision and continuous effort that go beyond the scope of a single programme. Thus, this project represents the initial, yet crucial steps of a longer process. To stimulate the involvement of the young researchers, the Government opened a new special "Fund of Excellence" amounting to over 100 million Albanian lek (Ministry of Education and Science of Republic of Albania, 2007).

4 The Output Side of the National Innovation Systems

The output of an innovation system is manifested through the new knowledge, new products and processes which are produced. Whereas indicators such as the Gross Expenditure on Research and Development (GERD) and number of researchers provide a measure of the resources potentially allocated to innovation, this chapter focuses on the results of the innovation processes and their output indicators such as patents and scientific publications.

4.1 Patenting Activities in Albania

Among other approaches, innovative output can be measured by patent data, the most important advantage of which is the wealth of the information supplied. A patent file granted by the European Patent Office (EPO) provides data on the invention, which is protected by the patent through the title, abstract and technological classification. Furthermore, patent data provide the only output measure available for almost all countries in the world, including Albania (Hörlesberger, 2006).

European inventors today have a choice between two alternatives when seeking patent protection for their inventions: the European Patent Office (EPO) and national patent offices. The EPO was set up to provide patent protection through a single procedure, defining the granting of patents in some or all of the contracting states of the European Patent Convention (EPC). The procedure for obtaining a patent at the EPO consists of two phases and sometimes a third phase dealing with the possible objections. In contrast to national patents that are valid in only one country, a European patent gives its proprietor equivalent rights to a national patent in each member state. Moreover, European patents may also be effective in some countries, including Albania, that have not yet acceded to the EPC (EPO, 2006).

A second barrier to patenting is the cost associated with a patent application. Studies estimate that the cost of an application and the 10-year maintenance of a patent at the EPO is approximately EUR 32,000 (Roland Berger Market Research, 2004). In contrast, applications to national patent offices may be less expensive (applications to local patent offices in the Western Balkans in particular are expected to incur a considerably lower cost than an application to the EPO) (Hörlesberger, 2006).

Albania has its own Patent and Trademark Office. From 1957 the protection of foreign trademarks in Albania was carried out by Chamber of Commerce. On 22nd March 1993, the function of the Chamber of Commerce for registration of trademarks and industrial design passed to the Patents Office (Decision: D.C.M. No 135), which was under the dependency of the Committee for Science and Technology. On 27th April 1994, the law on Industrial Property was approved; providing grants and protection for the following industrial rights, such as patents for inventions and utility models, trademarks and service marks, industrial design and appellation of origin. The activity of the Albanian Patent and Trademark Office (ALPTO) as a Central and Public Institution financed by the state budget under the dependency of the Council of Ministers began with the resolution of the Council of Ministers no. 313, "For functioning of the Directorate of Patents and Trademarks", dated 13th June 2000. ALPTO is a government institution, which provides grant and protection for: patents for inventions and utility models, industrial designs, trademarks and service marks, geographical indications and topography of integrated circuits. The tasks of ALPTO are determined and regulated by law no. 7819 dated on 27th April 1994 on "Industrial Property" and amendments in power. Today ALPTO is a public institution under the Ministry of Economy, Trade and Energy (METE) (Albanian Patent and Trademark Office, 2005c).

Its main activities are: to administer all the procedures for grant and protect the industrial property rights; to provide reliable examination and registration related to patents, trademarks, industrial design and geographical indications; to compose laws and regulations related with IP system; to act as a representative in the Courts for issues relating to the Industrial Property; to represent Albania and Albanian obligations, connected by bilateral agreement with a homologue office (the Directorate of Patents and Trademarks and Industrial Property State Office of Republic of Macedonia) and other international organisations for issues of Industrial Property (Albanian Patent and Trademark Office, 2005a).

ALPTO services are based on laws and regulation in force, offering new information to the public, free of charge, relating to the object of industrial property rights. This information can be found in the publications and bulletins of the office. The office also provides assistance by answering general questions in the field of industrial property rights; by helping to interpret the laws and regulations relating to forms of protection; by responding to questions concerning application procedures; by offering services to users all over the country; by increasing awareness of the industrial property systems through organisation seminars; by publishing specialised information in a tri-monthly journal; and by issuing regular leaflets and materials related to industrial property items (Albanian Patent and Trademark Office, 2005a).

ALPTO organises activities, trainings and seminars to increase the public awareness related to the Industrial Property Rights. It gives consultancy for universities, private companies, attorney offices, etc. ALPTO also organises seminars and training in the occasion of the Regional Cards Programme for South and Eastern Europe. This project is financed by the European Patent Office and the European Community (Albanian Patent and Trademark Office, 2005b).

Concerning industrial property rights, the Directorate General for patents and trademarks (GDPT) was restructured and given additional staff. Registration and administration of patents, trademarks and industrial designs has been computerised. This has improved the processing of applications and the supply of information. However, further strengthening of the capacity of both the copyright office and the GDPT is still required. The provision of training to judges, prosecutors and customs administration is not enough to solve the problem. The current industrial property law from 1994 needs substantial improvements (European Commission, 2007).

The drafting of the Law on Intellectual Property (in coordination with the legislation of the EU Member States and the framework of the SAA) was completed in October 2007. The draft law is completed in cooperation with the European Patent Office and Max Planck Institute (Bushati, 2007).

Amendments to this draft law are in full compliance with the *acquis communautaire* of the European Commission in the field of Industrial Property and specifically with:

- European Patent Convention (EPC 2000),
- Directive 98/44/EC on the legal protection of biotechnological inventions,
- Directive 98/71/EC on the legal protection of designs,
- Directive 89/104/EEC of the Member States relating to trade marks,
- Directive 2004/48/EC on the enforcement of intellectual property rights,
- Regulation (EEC) No. 1768/92 concerning the creation of a supplementary protection certificate for medicinal products,
- Regulation (EC) No. 1610/96 concerning the creation of a supplementary protection certificate for plant protection products,

- Regulation No. 6/2002 on Community designs,
- Regulation No 40/94 on the Community trade mark,
- Regulation No 2081/92 on the protection of geographical indications.

Among the main changes specified in this draft law in comparison with the legislation in force are:

1. The draft law provides for the protection of biotechnological inventions in line with the requirements of Directive 98/44/EC on the legal protection of biotechnological inventions
2. The draft law provides for the issuance of certificates of supplementary protection for medicinal products and plant protection products in line with the provisions of the Regulation (EEC) No 1768/92 concerning the creation of a supplementary protection certificate for medicinal products and Regulation (EC) No. 1610/96 concerning the creation of a supplementary protection certificate for plant protection products, and also reflects in detail the calculation of the additional time frame for Patents,
3. The draft law provides for the "objection" of the third party as regards the granting of ownership over an object of intellectual property within three months from the date of publication of application, thus avoiding future judicial disputes arising from the infringement of previous rights. The draft law foresees as well the restoration of rights, when the owner of the PI object has not been able to meet the deadline established by ALPTO,
4. The draft law specifically provides for temporary and safeguard measures to be taken by the court and other institutions engaged in the protection of intellectual property rights in case of infringement of IP rights, in line with the provisions of Directive 2004/48/EC "on the enforcement of intellectual property rights" and provisions of the Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement.

The draft law also gives to the judicial system and other institutions involved in the protection of Industrial Property, the opportunity to increase their role in the protection of other rights. The broad consultation of the draft law with the public and non-public partners is carried out by ALPTO during 2007. The procedure for the approval of the draft law has already started (December 2007) and it is expected that METE undertakes the respective legal initiative (Bushati, 2007).

On 19th February 2007, the Republic of Albania ratified both the Hague Act (1960) and the Stockholm (Complementary) Act (1967). On the same day, the Geneva Act of the Hague Agreement Concerning the International Registration of Industrial Designs was signed by the Republic of Albania. The notifications of these agreements by the Secretariat of the World Intellectual Property Organisation (WIPO) were made on 19th March 2007 for both The Hague Agreement and the Geneva Act (WIPO, 2008).

In the framework of strengthening institutional capacity of ALPTO, in 2007 some improvements have been made to the integrated information system in accordance with WIPO standards. These improvements include the completion of the database for all the Industrial Property objects (patents, trademarks and industrial designs) and correction of data imported and processing of applications carried over from previous years. These are processes observed and assessed by WIPO (Bushati, 2007).

In 2007, four Intellectual Property Bulletins were published on-line, thus informing on the IP

objects deposited or registered with the ALPTO, and giving the opportunity for opposition in case of violation of rights.[7] In continuation of the improvement of the services provided by ALPTO, for the first time it was made possible the printing of the new models of registration certificates and renewal of the Invention Patent, Trade Marks and Industrial Designs service. This model approximated ALPTO with the standards of the counterpart offices of the region and even more and it is implemented for the first time in Albania.

As regards the system of Industrial Property protection, ALPTO has cooperated with USAID and the Magistrates School to organise training courses in the field of intellectual property. In addition, a close cooperation with the Sector of Patents and Marks Protections at the Directorate General of Customs has been established.

Finally, in order to assist practitioners of this field, a Commentary for the Law on Intellectual Property containing a number of cases regarding the infringement of Intellectual property Rights has been compiled.

Another achievement is that patents are presented in a new format which constitutes an approximation with the standards of the European counterpart offices. The Patent Register (in electronic and also hard copy format) is created. 1,000 patents out of a total of 2,510 are recorded in the register. In 2007 the number of applications for the invention patents was 352 from EPO, 10 national patents and 4 Patent Cooperation Treaty (PCT) patents. For the first time since 1997, there is an increase in the number of national patent applications, from 3 in 2006 to 10 in 2007.

Figure 4.1: Division of Albanian patent applications (1993-2007) (Bushati, 2007)
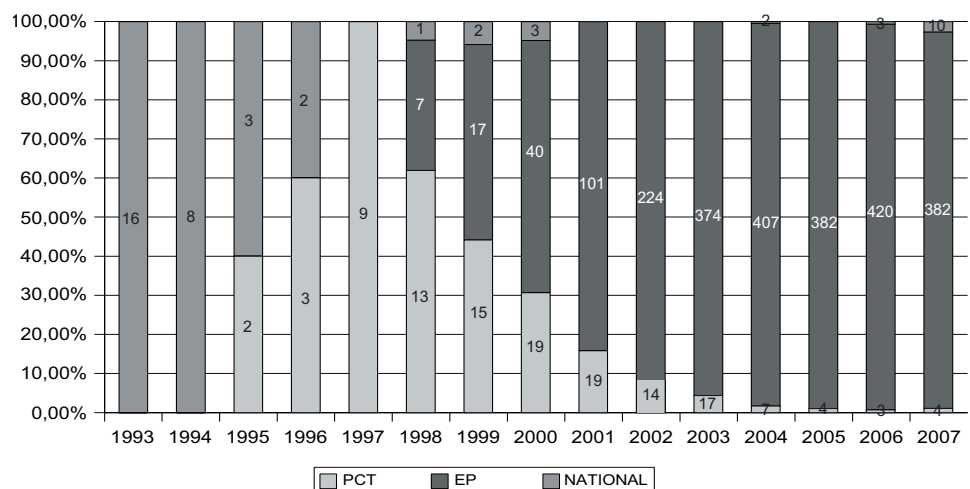
366 applications for patents were submitted in 2007 and 420 patents have been registered. 528 certificates of deposit were issued in 2007, compared with 208 of the previous year, out of which 298 are pending the expiry of the opposition/objection deadline following their publication in the Intellectual Property Bulletin No 17 and No 18. 268 notifications for completion of formalities were issued, compared with 135 of the previous year, 1,228 applications for upholding into force, compared with 460 of the previous year and 30 applications for change of ownership/address/name.

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[7] See http://www.alpto.gov.al/rubrika.asp?id=22&idv=9 as accessed 26.03.2008. In Albanian only.

Figure 4.2: Demonstration of increase in volume of work. Comparison between 2006 and 2007 (Bushati, 2007)
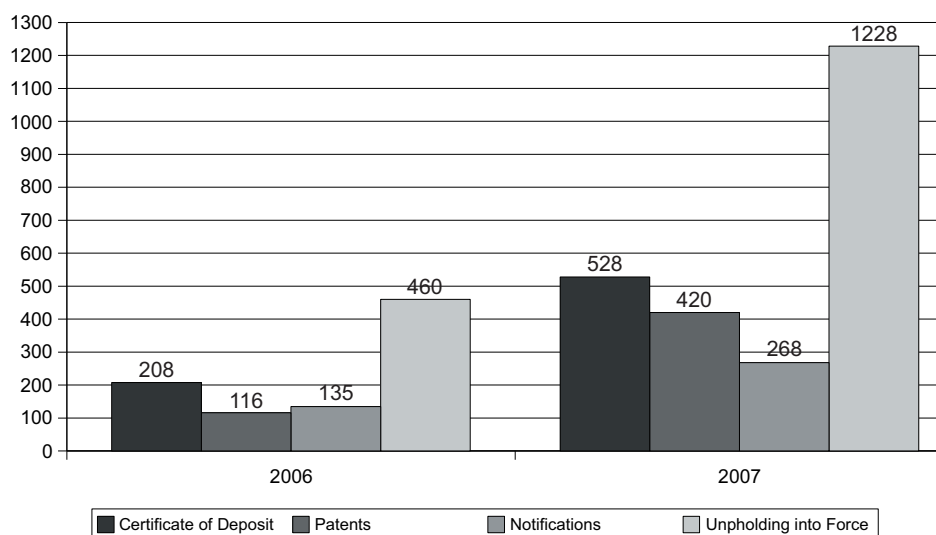
In 2007 74 patents were refused for their failure to meet the formalities within the legal deadline, 5 withdrawals were accepted, 29 patents were abandoned and 9 applications had abandoned out of a total of 366 applications for patents during this year (deposited after 15th December 2007).

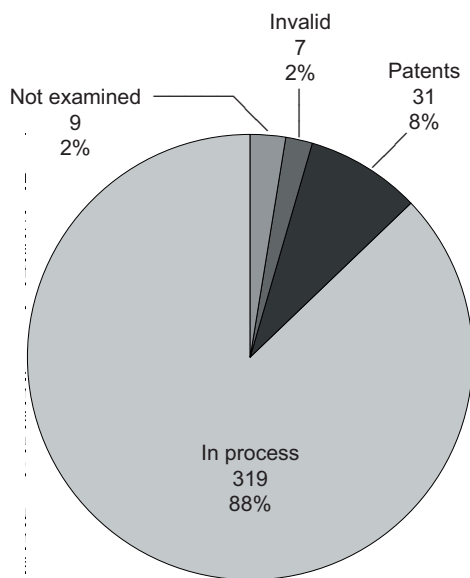*Figure 4.3: Status of applications for patents in 2007 (Bushati, 2007)*

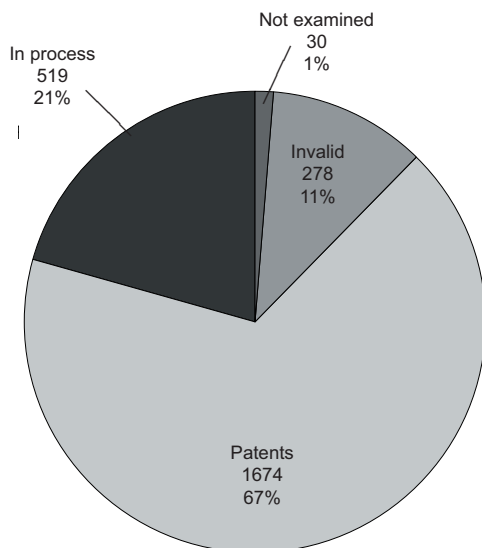*Figure 4.4: Total applications for patents (Bushati, 2007)*

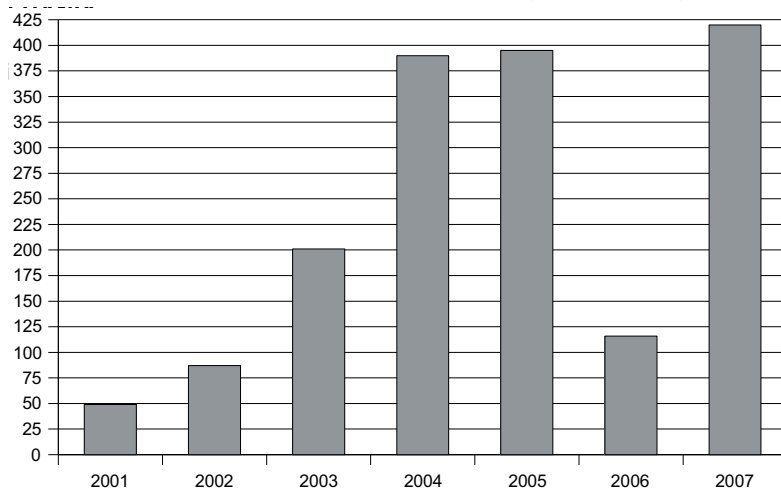*Figure 4.5: Number of issued patents from 2000 to 2007 (Bushati, 2007)*

Table 4.1: Comparison of patents issued from 2000-2007 (Bushati, 2007)

Year	Patent issued each year
2000	6
2001	49
2002	87
2003	201
2004	390
2005	395
2006	116
2007	420
Total	**1,664**

The graph and table below show the status of applications for patents during the years.

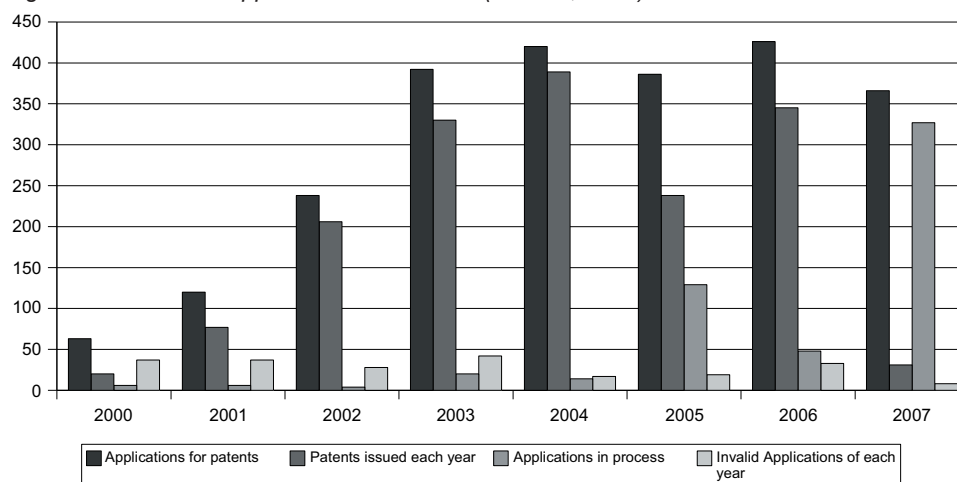*Figure 4.6: Status of applications 2000-2007 (Bushati, 2007)*

Table 4.2: Status of applications 2000-2007 (Bushati, 2007)

YEAR	Applications for patents	Patents issued each year	Applications in process	Invalid Applications of each year
2000	63	20	6	37
2001	120	77	6	37
2002	238	206	4	28
2003	392	330	20	42
2004	420	389	14	17
2005	386	238	129	19
2006	426	345	48	33
2007	366	31	327	8
Total	2411	1636	554	221

As regards trade marks and service, the number of applications in 2007 reached 892 applications (including the number of applications of 391 marks for renewal) and 947 registrations.

Of these applications, 454 applications for trade marks are examined and are under process, 528 registration certificates and 419 renewal certificates for marks are issued. The number of total applications during 2007 is lower than the number of issued documents. This shows that a greater work has been done, thus facing in the beginning of 2007 the work accumulated during previous years.

Figure 4.7: Number of issued documents versus number of applications in 2007 (Bushati, 2007)
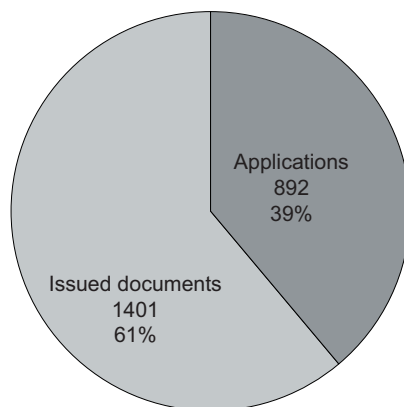
In 2005, 283 registration and renewal certificates were issued, compared with 369 registration and renewal certificates issued in 2006 (that is an increase of 30.4% from 2005 to 2006). In 2007, 947 registration and renewal certificates were issued, a further increase of 156.6% on the number of certificates issued in 2006.

During 2007, 454 certificates of deposit for trademarks are issued and published compared with 465 in 2006; notifications for completion of flaws and formalities are issued for 720 applications compared with 568 in 2006; 660 invitations for registration compared with 300 in 2006.

Figure 4.8: Comparison of documents issued for examination in 2006 and 2007 (Bushati, 2007)
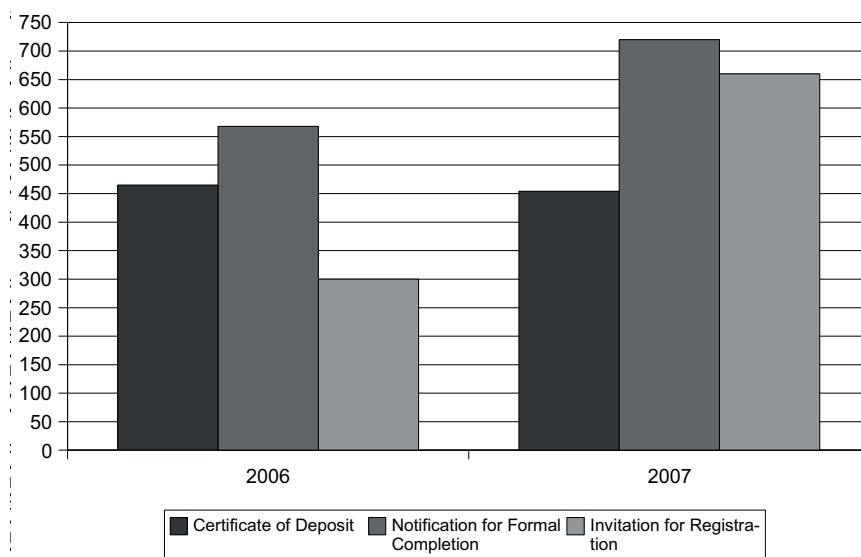
The greatest increase in the number of applications for marks has been mainly in the number of applications made internationally from the Madrid Agreement. In 2007, the number of these applications reached 4,264 trademarks. If a comparison is made of the number of application made nationally, locally and internationally in 2005 compared with applications in 2007, it is identified a slight increase in the number of local applications, even though the number of persons who apply and who have approached ALPTO has been greater compared with the previous years. Applications made from the Madrid Agreement have increased by 48.7%. At the same time, the great increase of the number of international applications has brought about the reduction, at a certain extent, of the number of national applications. But in total, the number of applications in 2007, compared with 2005 is increased by 34.4%.

Table 4.3: Comparison of national, local and international applications (2001-2007) (Bushati, 2007)

Years	2001	2002	2003	2004	2005	2006	2007	2005/07
Albanian applications	54	106	132	128	147	186	148	6.7%
Applications through national procedures of foreign applicants	696	550	451	399	825	809	744	-9.8%
Applications from Madrid Agreement	2115	1814	1903	2252	2866	3624	4264	48.7%
Total	2865	2470	2486	2779	3838	4619	5156	34.4%

Figure 4.9: Comparison of national, local and international applications (2001-2007) (Bushati, 2007)
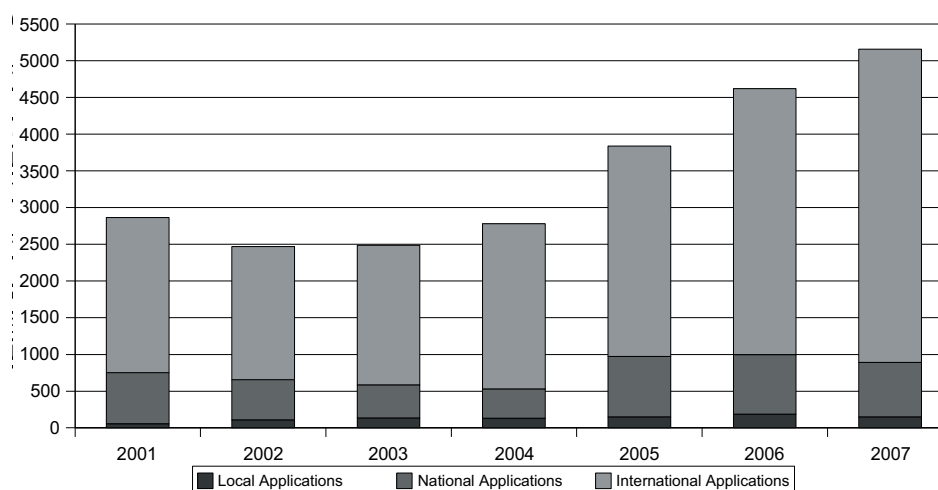

The table and graph below show the ratio of international registered and renewed marks in 2007/2006. It shows registrations in 2007 increasing by 42.2% on 2006 and the number of renewed marks increasing by 38%.

Table 4.4: Ratio of international registered and renewed trademarks in 2006 and 2007 (Bushati, 2007)

YEAR	2006	2007	2007 / 2006
Registered marks	2152	3062	42.2%
Renewed marks	871	1202	38 %
Total	3023	4264	41%

Figure 4.10: Ratio of international registered and renewed trademarks in 2006 and 2007 (Bushati, 2007)
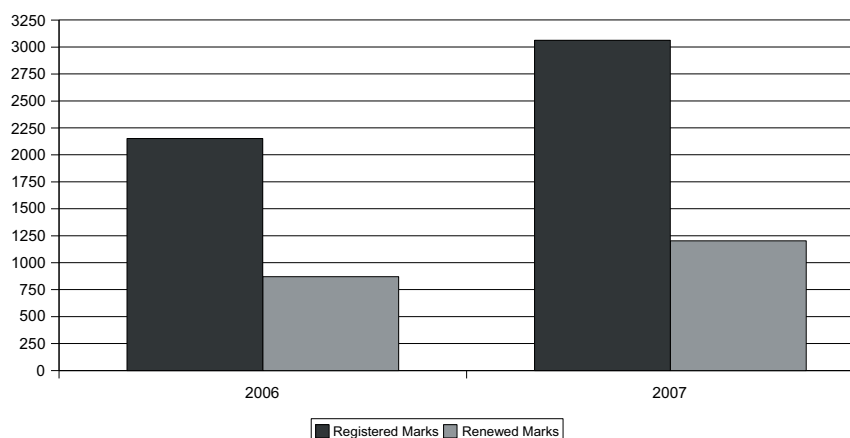
The Legal and External Relations Sector was established in September 2007 following the approval of the new ALPTO structure. This sector will cover the activity of the institution, first of all the following of the judicial cases involving the protection of industrial property rights which have increased considerably in 2007, and also the relations and administering of external relations of ALPTO.

A priority of the ALPTO activity has been focused on information technology: administering, maintenance, storage and processing of information concerning the Industrial property objects and IT administering, maintenance and infrastructure as a key element for the functioning of ALPTO, in line with international standards (for example, administering of the Industrial Property Automation System IPAS database).

4.2 Publication Activity in Albania

Most of the scientific work is carried out by the Albanian Academy of Science, universities and other research institutes. In the words of Peter Ballantyne in the 2006 UNESCO report "Accessing and Disseminating Scientific Information in South Eastern Europe", the Academy is certainly a local leader in this sector, since the publication is an integral part of its research process (Ballantyne, 2006).

Various scientific studies are published by the Academy's Publishing House *Shkenca* in the form of books, monographs, periodic volumes, bulletins and other types of literature; offering the output of scientific research to the academic community and wider public on a continuous basis. Albanians abroad (especially in Kosovo/UNMIK, the FYR of Macedonia and Italy) also play a role in the providing of these publications.

The principal aim of PH Shkenca is to publish studies in the field of Albanology - Linguistic, Historical, Ethnological, Folkloric, Archaeological and other fields of scientific research. The most important journals and periodicals of the Academy of Sciences of Albania are Philological studies, Historical studies, ILIRIA, AJNTS, Folk culture, the magazine Our language, Matters of the Albanian folklore, Candavia, published in Albanian and with a summary in English or French are listed in the CEEOL (Central and Eastern European Online Library) - an on-line archive, which provides access to summary text articles (access to the full text is restricted to subscribers) from 255 humanities and social science journals, electronic books and re-digitised documents pertaining to Central, Eastern and South-Eastern European topics. The CEEOL. is the result of 10 years of work by the Frankfurt Eastern/Western European Cultural Centre, Palais Jalta and intends to provide an on-line library and a document shop. Its content is provided by numerous publishers and editors, mainly from Central and Western European countries, which deal with Eastern Europe in terms of its history, languages and literature, along with its cultural, social and political realities (C.E.E.O.L., 2007).

One of the journals, the Albanian Journal Natural and Technical Sciences (AJNTS) (two publications per year in the English language) has an important role in the scientific community in Albania. A lot of papers are a contribution of scientists living in and out of the borders of Albania. These papers strengthen the cooperation and transfer of technologies in Albania. Many bulletins are prepared by the institutions of the Academy of Sciences of Albania (ASA) about the national emergency (for example, seismological, hydrological, meteorological, radiological dose rate) (Academy of Sciences of Albania, 2001).

Extensive exchange activities are conducted between Albania's National Library, its University libraries, the Scientific Library of ASA and a variety of external institutions. This has numerous positive effects for Albania: the libraries are not only enriched with scientific literature but the most important scientific publications, especially those of the Academy of Sciences, are not only sent to European libraries but also to the Library of Congress in the USA. It is thought that the situation described by the above-mentioned report to UNESCO, stating that Albanian researchers seem "to need additional training and support to help them publish in regional and international journals" is now in the past (Ballantyne, 2006).

Another important source for the scientific publications are the private publishing houses with the original publications of well-known Albanians, but also with the publication of important internationally-renowned scientific works, that have become part of the scientific community since their translation to Albanian. However, the crucial problem today regarding scientific publications in Albania is the total lack of online access to these publications that are today a reality in many countries (Bushati, 2007).

5 National R&D Strategy and Legal Framework

The societies of the South Eastern European region have all been going through radical changes and transitions since 1990, although from significantly different starting points. Most S&T policies in the Western Balkans region are characterised by their encouragement of sustainable support for basic research at higher education institutions and research institutes, for the development of human resources and for cooperation inside the framework of the European Union's programmes for RTD and joint research programmes with the European Science Foundation or bilateral agreements (Dall, 2006).

In technology policy, emphasis is placed on linking research institutions as sources of knowledge with industry and SMEs, as well as encouraging the establishment and functioning of intermediary institutions (Kobal, 2005).

5.1 Legal Framework for National R&D System

A legal framework is indispensable in the organisation of R&D institutes, the innovation infrastructure and programmes that provide grants to research organisations and innovative companies. Most commonly, laws are prepared separately for the areas of S&T and higher education. The Albanian system of higher education is still affected by the new Law on Higher Education, which enhanced the scope for autonomy of higher education institutions, institutionalised the Rectors Conference as a major consulting body, set up a new accreditation system, changed admission criteria and promoted the adoption of the European Credit Transfer System (ECTS). Legislative priorities are determined by the requirements of the Bologna Declaration (signed by the Albanian government in September 2003) and not by the needs of scientific research (Dall, 2006).

In compliance with the above-mentioned Law of Higher Education (which was amended in 2007) in the Republic of Albania the Albanian Government has emitted several normative acts, decisions, directives and decrees, which have qualitatively influenced the process of the Bologna Chart implementation (Theodhori, 2006). But the new Law of Higher Education opens the new opportunities on the progress of both higher education and scientific research.

On 22nd May 2007, the Albanian Parliament approved the new law "On Higher Education", which is meant to replace the previous law on Higher Education, dating from 1999 (Ministry of Education and Science of the Republic of Albania, 2007b). This law introduces a number of new issues:

- It establishes the legal framework for the three university cycles after the European model (for example, the ECTS system and the Diploma Supplement).
- It provides for the interdisciplinary study programmes, the joint programmes and the continued learning
- Quality Assurance is conducted through the internal and external evaluation and the accreditation, essential to the Bologna Process.
- The financial provisions are among the most advanced, enabling the Higher Education Institutions to manage their budget on their own, as unconditional transfer.
- It has provisions for the efficiency and management of the research at universities, following the reform of the Research Institutes.
- It offers a comprehensive framework for private higher education, previously based on an Act of the Council of Ministers in 2002.
- For the management, the new provisions also enable new governing bodies, enhancing the responsibility, management, reporting, and transparency within the university.
- The Council of Professors at faculty level will be responsible for the third cycle studies, which until now were in the exclusive hands of the Dean.
- The Council of Ethics will have considerable responsibility and role in the context of a healthy atmosphere, in the circumstances when cases of abuse have become more numerous.
- The provision of the matriculation system will help to make administration more efficient and instantaneous (Gjinko, 2007)

The Law on Science and Technological Development sets the objectives of S&T policy, which include stimulating the global integration of Albania's national R&D activity and encouraging privatisation of S&T activities. It also defines the procedures for S&T policy development (Dall, 2006).

The IP legislation is fully in compliance with the TRIPS Agreement and also with the EU Directives on intellectual property matters (European Commission, 2006a).

5.2 Main Documents Reflecting National Innovation Strategies

Poverty reduction and economic development are considered to be the highest priorities on the Albanian policy agenda. However, the main strategy and key planning documents used by the Albanian government are of a rather general nature. The integration of the Stabilisation and Association Agreement with the European Union, the "UN Millennium Development Goals" (which do not focus on science) and the "National Strategy for Socio-Economic Development" are relevant strategies to be put into practice. The "National Government Action Plan" is the steering instrument which aggregates sectoral government action plans and consolidates the main policies. It aims to provide an overview, although the harmonisation of strategies is insufficient and the prioritisation of goals still remains unclear (UNDP Albania, 2005). To date, neither science nor research have been mentioned as a top national priority (prioritisation has mainly focused on health and education).

Nevertheless, the new Albanian government has established this area as a priority for the first time and far-reaching reforms are expected. A master plan for political development has been set up, including institutional and legal reforms. First and foremost, the aim is to improve the integration of higher education into the science framework. The master plan, which is designed to define the strategic direction and process of change for the future of higher education in Albania between 2006 and 2016 has been drafted and was in the consultation process during the last update of this report. Once agreed, it will form the basis of an action plan. The draft master plan also talks about the implementation of an intermediary body, a "Research Strategy Group" which will develop a national research strategy and rationalise research capacity (Gjinko, 2007).

The forthcoming national research strategy will select the areas in which research efforts are to be concentrated and provide a basis for rationalising the integration of the research institutions. The draft also states that academic research will be funded selectively on a project basis and through competition. This is foreseen mainly for the universities in Tirana. On the other hand, some small 'base line' funding for all universities will be provided to allow the development of one or two research specialists (Draft Master Plan for Higher Education, 2006; Agolli, 2007a). The encouragement of young researchers, excellence, mobility and the research infrastructure are key aspects of research development. Furthermore, numerous bilateral agreements have been signed and Albania's integration into the SEE-ERA.NET project and joint calls in 2006 promoted further internationalisation of Albanian research.

The "National Strategy for Socio-Economic Development" (2001) has suggested, among many other measures, the harmonisation of the activities of research institutions with the requirements of industry and agriculture, the establishment of a national centre for agricultural scientific research and the promotion of applied research in accordance with the needs of farmers (Council of Ministers of Republic of Albania, 2001). The Progress Report on the implementation of the National Strategy for Socio-Economic Development during 2003, "Objectives and Long Term Vision" and Priority Action Plan 2004-2007 of April 2004, point out that the process of creating a National R&D Programme has already begun for some of the main areas (Republic of Albania, 2004).

Furthermore, the definition of standards for scientific research is included in the mid-term plan of the Ministry of Education and Science. The National Education Strategy 2004-2015

provides a roadmap intended to help strengthen the sector's performance and to improve the learning outcomes and efficiency of the system. In addition, the Strategy on Employment and Vocational Training (Ministry of Labour and Social Affairs of the Republic of Albania, 2003) deals with instruments that contribute to the enhancement of innovation. The job creation target is focused on small and medium sized enterprises and on encouraging direct foreign investment. Although the term *innovation* has not been used, the *"development and strengthening of competition in the market through production of more competitive goods, transfer of new technologies and know-how"* (Ministry of Labour and Social Affairs of the Republic of Albania, 2003) is one of the principal aims in supporting SMEs. The Rural Development Strategy (World Bank, 2002) and the Mid-Term Programme for Integrated Rural Development (2004-2007) also deal with the strengthening of R&D as a major area of importance. The Action Plan for the Implementation of European Partnership Priorities (Council of Ministers of Republic of Albania, 2004) discusses legislative and institutional measures focusing on agricultural research, such as setting up a single Agency for Agricultural Research and Extension. Another important document is the National Information and Communication Technologies Strategy (Republic of Albania, 2003), approved in April 2003, which highlights research in ICT as a part of one goal, as well as the implementation of ICT education in Albanian higher education institutions and academic networks (Dall, 2006).

5.3 Main Fields of Intervention and Research Priorities

Innovation policy as such has only recently re-emerged in the Western Balkan countries, after having been reduced to a secondary role during the transition process. According to Radošević, innovation policies in the region of the Western Balkans should recognise the structural weaknesses of their individual innovation systems and apply country-specific solutions, as opposed to the rather imitative mode that has so far prevailed. Investment in R&D and high-tech orientation are regarded as the dominant paradigm in innovation policy (Radosevic, 2005).

Serious long-term structural problems that affect the S&T sector need to be discussed in order to assure further development. Amongst these structural problems are budgetary constraints and public debt, a generally low level of development, widespread unemployment, poverty and massive migrations, pointing to the need for industrial restructuring in largely agricultural, de-industrialised economies (Uvalic, 2005). Due to the overall lack of resources, prioritisation is of utmost importance, research orientation needs to be steered towards the economic and social needs of the present in order to make provision for the future. International programmes need to support foresight studies and the process prioritisation, as simply focusing on the RTD Framework Programme or imitating the strategies of other countries will not bring the desired results (Uvalic, 2006). The draft master plan for higher education also raises several current concerns, such as the inhomogeneity of the system on the institutional level, the insufficient level of university autonomy which shall be increased, as well as ensuring external and internal accountability and better management (Agolli, 2006).

Priority setting in the S&T sector is intended to facilitate efficient performance of certain identified S&T fields by providing a predictable allocation of critical-size funds. The need to define thematic S&T disciplines and fields has been recognised by all countries. Generally, the research priorities in the region are Information and Communication Technologies, Life sciences, research on Agribusiness and Biotechnology, Genomic research, Environmental and Materials research, and research on renewable energies and sustainable development as well as water management, transport, Aerospace research, Humanities and Social Sciences, and research in SMEs, although the level of specification varies from country to country. A great deal has been achieved in terms of institution and strategy development. In

general, however, some papers remain superficial and many statements have more to do with paying lip service than real policy implementation and related operations. The level of aggregation seems too broad and thus, goal-oriented interventions will be difficult to identify and are unlikely to generate the expected benefit. Much remains to be done, including the implementation of national foresight studies in order to support the prioritisation process. It would also be worth considering a complementary comparative regional foresight exercise to assist the diverse national attempts (Uvalic, 2006).

Table 5.1: National R&D Programmes in Albania (Agolli, 2007a; Gjinko, 2007)

Period	Selected National R&D Programmes
2003 - 2005	• Albanological and Humanity Studies • Agriculture and Food • IST • Public Health • Natural Resources • Biotechnology and Biodiversity
2007-2009	• Social and Albanological Sciences • IST • Biodiversity and Environment • Agriculture, Food and Biotechnologies • Health • Water and Energy • Materials

Albania still needs to focus on institutional development. Long-term objectives include both transforming the education and research network into an innovation system, and developing structures, competences and capacities in order to properly evaluate and monitor scientific projects, including transparent recruitment policies and payment systems. Further actions for change include reorganising research institutes and creating national research centres, improving the infrastructure and introducing statistical standards. The focus is also on international and regional cooperation in bilateral agreements, regional actions, and European and international RTD programmes (Ministry of Education and Science of the Republic of Albania, 2004). In general, tasks that will positively influence the national innovation system include improving and completing the legal framework and working conditions for public administration, fighting corruption, and implementing and enforcing laws. Priority tasks according to the government include improving the scientific output, protecting and developing national interests, combining research and higher education, observing intellectual property rights and participating in international S&T co-operation (Ministry of Education and Science of the Republic of Albania, 2005). Nevertheless, these elements are hardly quantified with measurable indicators, and to date have not been properly programmed, monitored or evaluated (UNDP, 2005), but the new Government step by step working to ameliorate the situation through projects for this topic: it's working to build up the S&T statistics in Albania.

Higher education and research receive little support from the donor community, although some attention is being paid to improving ICT networks and technical infrastructure. Shortcomings in the institutions themselves and the organisation of R&D can be identified as following (ICBSS, 2006):

- an absence of any institutional organisation with programmes and projects of wide interest;

- a lack of ongoing scientific activities (e.g. conferences, journal production etc.) in many sub-structures of institutions;
- modest implementation and usage of the national R&D programmes;
- a considerable part of the qualified staff co-operates outside the institutional structures.

S&T policy is mainly focused on applied research. Until 1999, there were fifteen priorities on the agenda; a policy which is now being criticised by the ministry, which says "*everything is a priority = nothing is a priority*" (Ministry of Education and Science of the Republic of Albania, 2004).

A series of positive elements have been registered in the last years regarding the R&D strategy activities. However, these elements alone cannot compensate the need for a comprehensive intervention, studied, accepted and realised on the basis of new principles. In summary, the main positive developments are listed below:

- A systematic change in science funding was adopted through the introduction of national programmes with three-year cycles and a considerable reduction in the number of priority fields, meanwhile until 1995, priority fields changed each year, and thus, the meaning of 'priority' was lost, because each field was financed in such a modest way (the annual fund is EUR 410,000).
- The internal integration effort was increased: the MoES adopted the concept of working in the mixed scientific research groups within the applications for national programmes and international projects, thus eliminating the risk of parallel development and duplicated efforts, while at the same time stimulating cooperation between different institutions and groups.
- A more active participation in international programmes through the projects of the scientific community in the country took place.
- There was a shift to standardise practices in R&D policy delivery - the whole procedure for national programmes was adopted according to the European standards.
- Since 1999, balanced bilateral agreements were reached, even financial ones, based on the international criteria of evaluation. In the realisation of the "Protocols of Co-operation", under the responsibility of the MoES, the same procedure is applied, with the same basic documents and in a synchronous way in both countries, according to the bottom-up principle.
- In the last few years, a slight increase in financial support, especially institutional funding, was achieved.
- Successful interventions occurred in the improvement of infrastructure. The MoES supported the establishment of modern computer networks in five universities, new modern laboratories, etc.
- An increase in cooperative initiatives concerning applications of scientific-technological products in the private sector was manifested.
- The MoES is also becoming active in a series of regional initiatives and, bilateral scientific relations were extended to the FYR of Macedonia and Slovenia (from two to four joint bilateral inter-governmental cooperation projects within each country were running in 2006); two others are under finalised with Turkey and Austria.
- In 2005, financial support was provided at a percentage of 50% to research institutes and 50% to universities. In 2006, it was 35% for research institutes and 65% for universities (Agolli, 2007a).
- National R&D Programmes (NRDP) receives financial sources from the state budget's R&D 'bottom-up' initiatives. The compilation of each NRDP programme

describes the main development objectives of the priority fields. The NRDPs are prepared by a group of experts and approved according to the standard rules used by the Council of Higher Education and Science. The MoES is responsible for the implementation and complete financing of the project (programmes are implemented through projects, with duration of three years). Six national R&D programmes were implemented during 2003-2005 and six others to be implemented (during period 2007-2009) started only this year (NRDP projects since November 2007) on the priority fields. A competitive system is used to allocate financial support. (ICBSS, 2006; Agolli, 2007a).

- Association to the Framework Programme (FP7) as of 1st January 2008 will boost international cooperation.

Further problems and shortcomings need to be addressed in near future in order to improve the existing institutional capacity in Albania (ICBSS, 2006):

- the legislative base and administrative links leave much to be desired;
- the actual supporting infrastructure is insufficient and has limited competence;
- the system of research institutions is dispersed, with many small and unnecessary units;
- in many cases the development policy for research institutions continues to demonstrate a lack of adaptation to the new economic situation;
- the level of research in higher education institutions is not at the proper level;
- there are no quality and quantity standards for evaluating the institutions and scientific work;
- the cooperation between the different units inside the country continues to be limited;
- the basic infrastructure is of a low level;
- the information for respective scientific communities outside the country is missing;
- international integration is still low;
- studies conducted in the past have a low practical impact.

Some other weaknesses and threats, for instance those identified in the Great-IST project, can be to a large extent generalised (SBRA-Great-IST, 2007): low access to facilities, low priority for R&D, illustrated by very low GERD, low level of participation in EU RTD; politicised, as opposed to professional administration capable of creating partnerships and managing complex relations between stakeholders in multiple innovation related sectors; limited qualified information technology personnel; lack of RTD statistics; unfavourable general business climate; weak network of SME associations and inadequate SME representation at national level; high unemployment; poor broadband infrastructure and access; large gap between declared ICT strategies and actual policy implementation; absence of motivation to harmonise with EU ICT policies due to unclear prospects of European integration; large grey economy (estimated up to 50% of GDP); lack of stability in the region and; inaction of broadband development and uptake.

The SBRA-Great-IST project also stated some indicators showing the positive trend, especially in the IST domain (SBRA-Great-IST, 2007): rather good performance in FP6 projects; strong diasporas, potentially capable of supporting ICT-based development and emergence of knowledge economy; dynamic economic growth; pilot and experimental projects (and technologies) based on best practices in neighbouring countries; network of Public Access Centres (PACs), to be established in rural areas of Albania to inform Albanians on ICT benefits as well as to provide access to modern services; an initiative to establish a high-speed internet network between various governmental institutions; introduction of a variety of national and

international IST projects, for example, IS2WEB, INTERREG IIIB CADSES ELISA, TRISTAN-EAST, SEEREN, TERENA, SEE-GRID.

6 Summary and Draft Conclusion

South Eastern Europe cannot be viewed as a homogenous area, although most of the countries in the region are challenged by similar issues, albeit of very different degree. The underdevelopment of S&T governance in Albania is among important structural problems requiring urgent attention. Although a variety of formal and informal institutions, mechanisms and procedures for managing S&T infrastructure are in place, there is a clear inconsistency between the functions described in the legislative framework and their actual implementation. Albania clearly needs to continue its efforts in developing a sustainable strategy, also taking regional and European dimensions into account. Foresight and the identification of innovation capacities will help to develop policies and a long-term strategy in a regional context. A high level of awareness among the public and politicians about the relevance of RTD and the need for a dialogue between the economy, academia and administration will provide the basis for developing a science policy that is in line with economic policies and priorities (Dall, 2006).

R&D was one of the system elements most negatively affected during the transition and crisis period of the last 15 years. The research budget of Albania is still bellow the threshold level, while modernisation of the institutional and structural set-up of the national innovation system is long overdue. Links to other subsystems, such as education, the regional economy, and the financial and banking system, are generally still underdeveloped. Systemic problems which negatively affect the research and innovation systems in the country are mostly a result of overdue reforms of the S&T policy and RTD structures. The legislative system is characterised by a disruptive S&T policy formulation process, an overall low status of S&T in governmental policy priorities, a weak policy delivery system in terms of institutional structures and capacities, a lack of sufficient public and private funding for RTD, the generation renewal and the brain drain problem etc. Other problems include the need to revitalise RTD activities (in terms of increasing the demand for RTD results in industry, addressing the imbalance between basic, interdisciplinary and applied research, improving the knowledge base in technical disciplines and redeveloping the physical RTD infrastructure) and internationalise RTD activities. However, in comparison with other developing regions, South Eastern Europe still has a fairly sound human capital basis. Its absorptive capacity is central for learning, assimilating and using the knowledge developed elsewhere. At the same time, the relative losses in quality at all levels of the education system are worrying (Schuch, 2006).

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8 List of Acronyms

AAN	Albanian Academic Network
AIIS	Albanian Institute for International Studies
AJNTS	Albanian Journal Natural and Technical Sciences
ALPTO	Albanian Patent and Trademark Office
ASA	Albanian Academy of Sciences
BERD	Business Expenditure on R&D
BSEC	Black-Sea Economic Co-operation
CADSES	Central, Adriatic, Danubian and South-Eastern European Space
CARDS	Community Assistance for Reconstruction, Development and Stabilisation
CEEOL	Central and Eastern European Online Library
CEI	Central European Initiative
CORDIS	Community Research & Development Information Service
CTBTO	Comprehensive Nuclear-Test-Ban Treaty Organisation
EC	European Commission
ECTS	European Credit Transfer System
EPC	European Patent Convention
EPO	European Patent Office
ERA	European Research Area
ERA-NET	European Research Area Network
EU	European Union
EUR	Euro (currency)
FP5, FP6, FP7	European Community Framework Programmes for Research and Technological Development
FTE	Full Time Equivalent
FYROM	Former Yugoslav Republic of Macedonia
GERD	General Expenditure on R&D
GOVERD	Government Expenditure on R&D
GDP	Gross domestic product
HERD	Higher Education Expenditure on R&D
HP	Hewlett Packard
IAEA	International Atomic Energy Agency
ICBSS	International Centre for Black Sea Studies
ICT	Information and Communication Technologies (also: one of the priorities in the Cooperation Programme of FP7)
INIMA	Albanian Institute of Informatics and Applied Mathematics
INSTAT	National Statistical Office of Albania
INTERREG IIIB	EU-funded programme that helps Europe's regions form partnerships to work together on common projects
IP	Intellectual Property
IPA	Instrument for Pre-Accession Assistance
IS2WEB	FP6 project "Extending Information Society Networks to the Western Balkan Region"
ISOTEIA	Integrated System for the Promotion of the Territorial-Environmental Impact Assessment in the Frame of Spatial Development
IST	Information Society Technologies (also: one of the priorities in FP6)
Lek	Albanian currency
MFA	Ministry of Foreign Affairs

MoES	Ministry of Education and Science of Albania
MoU	Memorandum of Understanding
METE	Ministry of Economy, Trade and Energy
NATO	North Atlantic Treaty Organisation
NGO	Non Governmental Organisation
NRDP	National R&D Programmes
NSSED	National Strategy for Socio-economic Development
OECD	Organisation for Economic Co-operation and Development
PAC	Public Access Centre
PCT	Patent Cooperation Treaty
PIU	Programme Implementation Unit
PPP	Public Private Partnership
p.p.p.	purchasing power parity
R&D	Research and Development
RTD	Research and Technological Development
SAA	Stabilisation and Association Agreement
SAP	Stabilisation and Association Process
SBRA	Slovenian Business and Research Association
SEECP	South Eastern Europe Cooperation Process
SEE-ERA.NET	FP6 Project " Southeast European Era-Net"
SEEFIRE	South-East Europe Fibre Infrastructure for Research and Education
SEE-GRID	South Eastern European Grid-enabled e-Infrastructure Development
SEEREN	South Eastern European Research & Education Network
SFRY	Socialist Federative Republic of Yugoslavia
SMEs	Small and medium size enterprises
S&R	Science and Research
S&T	Science and Technology
TERENA	Trans European Research and Education Network Association
TRIPS	Trade-Related Aspects of Intellectual Property Rights
UN	United Nations
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNIDO	United Nations Industrial Development Organisation
USA	United States of America
USD	US Dollar (currency)
USPTO	United States Patent and Trademark Office
WIPO	World Intellectual Property Organisation
WMO	World Meteorological Organisation
ZSI	Zentrum für Soziale Innovation (Centre for Social Innovation, Austria)

Annex

Important laws in the legal S&T framework of Albania (Dall, 2006; Agolli, 2007a)

Law on Science and Technological Development (1994), amended in 1998	Sets out the objectives of S&T policy, which include stimulating the global integration of national R&D and encouraging privatisation; expounds the procedures of S&T policy development. The main functions of the Committee for Science and Technology are currently performed by the Ministry of Education and Science, with a very limited number of people now working on it, i.e. formulating S&T policy and national R&D programmes in order to implement this policy (Agolli, 2007a).
Law on Higher Education (amended in 2007)	It regulates the activities of universities and faculties, the establishment and work of managing bodies, way of choosing teaching staff, etc. The role of university, its scope of work and basic work conditions and objectives are regulated by laws, while the overall organisation and activities are more closely elaborated by their statute.
Law and Statute of the Academy of Sciences, Nr.9182, 2nd May 2004	It regulates the activity of Academy of Sciences of Albania and their scientific research of institutes and centres.
Law No. 7819 on Industrial Property (1994), amended by Law No. 8477 (1999)	Regulates industrial property, trade marks and industrial designs (these fields are also partly regulated by the Penal Code, Civil Code, Penal Procedure Code, Civil Procedure Code and Customs Code Law No. 8449 (1999).
Law on Copyright No. 7564 (1992), amended by Law No. 7923 (1995), Law No. 8594 (April 2000) and Law No. 8630 (July 2000).	Regulate copyright and related rights (those fields are also partially regulated by the Council of Ministers' decision Act No. 309 (2000) on "User's Tariffs", as well as in parts of the Penal Code, Civil Code, Penal Procedure Code and Civil Procedure Code.
Law No.9741, 21st May 2007	For the Higher Education in Republic of Albania
Law No. 7819 27th April 1994	On Industrial Property
Law No. 8477 22nd April 1999	Amendments on Law,No.7819
Law No. 9525 25th April 2006	Amendments on Law 7819, Date April 27, 1994, Law On Industrial Property
Law on No. 8488 13th May 1999	Protection of Topographies of Integrated Circuits
Council of Ministers Decision Act, No.313, 13th June 2000	Functioning of Albanian Patent and Trademark Office
Council of Ministers Decision Act, No. 568, 23rd October 1995	Fees of Albanian Patent Office for Industrial Property Objects

Prime Minister order, 22nd October 2001,	For approval of administrative structure of Albanian Patents and Trademarks Office
Law No. 8449, 27th January 1999	Penal Code, Civil Code, Penal Procedure Code, Civil Procedure Code, Customs Code
Decision Act, No. 248, 27th April 2007	National Agency of Information
Law No. 9647, 27th November 2006	On the adherence of the Republic of Albania to Geneva Act of the Hague Agreement concerning the international registrations of industrial designs, Regulations Under the Geneva Act 1999".Industrial designs Creation of new and original industrial designs
Law No. 9648, 27th November 2006	On the accession of the Republic of Albania to Hague Act of the Hague Agreement concerning the international registrations of industrial designs