



REPUBLIC OF ALBANIA

National Strategy of Science, Technology and Innovation 2009–2015

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CONTENTS

Preface	3
Acronyms and abbreviations	4
Preamble	5
CHAPTER 1. Overview of the present situation	6
1.1. Reform hitherto in the STI system	
1.2. Science system and its component institutions	
1.3. National STI system capacities and performance	
1.4. Legal framework and decision-making process	
1.5. Albanian international and European cooperation on STI	
CHAPTER 2. Vision, priorities and strategic goals	14
2.1. Vision	
2.2. Research priorities	
2.3. Goals and milestones	
CHAPTER 3. Policies to be pursued	17
3.1. Structuring policy implementation	
3.2. Strengthening policy-making capacity	
3.3. Creating an appropriate capacity for programme management	
3.4. Improving the legal and institutional framework for research policy-making and research funding	
3.5. Adopting an adequate budgetary framework	
CHAPTER 4. Evaluation and monitoring	26
4.1. Internal procedures and monitoring	
A. Institutional evaluation	
B. Programme evaluation	
C. Organisational arrangements	
4.2. International benchmarking instruments	
ANNEXES	28
Annex 1. Action Plan	29

Preface

Dear Reader,

I have the pleasure to present the Crosscutting Strategy of Science, Technology and Innovation (SSTI), the first document of this kind that will comprise the long-term platform of development, research and innovation in our country for the period 2009–2015.

The high rates of economic and social development required in the process of Albania's NATO membership and European Union accession necessitate the strengthening of the role of science, technology and innovation in our society. This role comprises fundamental factors of a knowledge-led economy which are essential to face the great challenges that lie ahead in a global and ever competing world.

This strategy defines clearly the vision and the number of important objectives that relate to the financial and human resources involved to meet them, being harmonized with the objectives of the National Strategy for Development and Integration, with those of the Higher Education Strategy and other sector strategies. It is a clear indication of current government commitment to place research and science alongside higher education in the focus of governmental priorities.

Together with its action plan SSTI comprises a valuable guideline for the work of policymakers, universities, academics and Albanian researchers in order for them to make their contribution to meeting the objectives and activities during implementation of the Strategy.

I would like to take this opportunity to thank cordially all those who contributed in drafting this Strategy, employees of the Ministry of Education and Science, the Department of Strategy and Donor Coordination (DSDC), university staff, academics and specialists of line ministries and other agencies, who enabled the collection of information and gave valuable comments and suggestions.

Special thanks go to UNESCO Regional Bureau for Science and Culture in Europe (BRESCE) experts who enabled the technical assistance and financial assistance to produce these documents. Considering approval of this strategy as an important step, we are aware of the great work that lies ahead for its implementation. Therefore, I invite all stakeholders in this process to join their efforts to realize together our common aims in this field, which is both beautiful and important, in order to guarantee a rapid, stable and long-term development of Albanian society.

Deputy Prime Minister

Genc Pollo

Abbreviations and Acronyms

ACES	Albanian Centres of Excellence in Science
ALPTO	Albanian Directorate of Patents and Trademarks
ARA	Albanian Research Agency
BIC	Business Innovation Centre
CARDS	Community Assistance to Reconstruction, Development and Stabilization
CHES	Council for Higher Education and Science
CIP	Competitiveness and Innovation Programme
COST	European Cooperation in Science and Technology
CSPTD	Council for Science Policy and Technological Development
EEN	Enterprise Europe Network
EPO	European Patent Organisation
ERA	European Research Area
EU	European Union
EUREKA	European network for market-oriented, industrial R&D
FP	Framework Programme
GDP	Gross Domestic Product
GERD	Gross Expenditure on Research and Development
IPA	Instrument for Pre-Accession
IRC	Innovation Relay Centre
IPR	Intellectual Property Rights
KALSH	Higher Education and Science Council
MES	Ministry of Education and Science
NSDI	National Strategy for Development and Integration
OECD	Organisation for Economic Cooperation and Development
STI	Science, Technology and Innovation
RI	Research Institutes
R&D	Research and Development
RTDI	Research, Technological Development and Innovation
UNESCO	United Nations Educational, Scientific and Culture Organisation
UNECE	United Nations Economic Commission for Europe
UNIDO	United Nations Industrial Development Organisation
UNDP	United Nations Development Programme

Albania's National Strategy on Science, Technology and Innovation (STI), 2009–2015

Preamble

Science, technology and innovation (STI) are clearly recognised as fundamental factors in a knowledge-driven economy and are important at all stages of development, albeit in different forms or modes. The capacities to undertake scientific and applied industrial research, to transfer them, to adapt and assimilate new technologies into economic structures and diffuse them into society, and to creatively develop new products and services using technologies (product and service innovation), as well as through marketing, design and organisational change (non-technological innovation), are fundamental to national competitiveness. The European Union (EU), which Albania aspires to join, has set clear objectives related to research and innovation as part of its 'Lisbon Strategy': to make the EU the most competitive economy in the world. Albania, like other Western Balkan candidate and associated countries¹, has lagged behind such developments due to the need to focus on laying the foundations for growth (through education, legal frameworks, alleviating poverty, etc.). However, the time has come to invest more in creating, diffusing and applying knowledge if Albania is to meet its long-term development goals.

The need for a STI strategy in Albania is recognised by a wide-group of stakeholders and is now placed firmly on the policy-making agenda thanks to the process of drafting this Strategy. Co-ordinated by the Ministry of Education and Science (MES), assisted by the United Nations Educational, Scientific and Culture Organisation (UNESCO) and its consultants, the Strategy is cross-sectoral in nature and based on consultations and meetings with representatives of a broad panel of ministries and the scientific community.

It is important that the ownership of the Strategy is as wide as possible and that the need for an on-going investment in STI is accepted across society and the political spectrum in parliament. Those countries with the most successful record in investing in STI to boost economic competitiveness are all characterised by a well-grounded cross-party consensus that ensures that the commitment to a knowledge-based economy and society is a constant feature of government policy.

An Action Plan detailing the operational aspects of the proposed measures for the period 2009–15 complements this Strategy along with a proposal for the establishment of an Albanian research funding agency.

Moreover, in the framework of the EU's IPA 2007 implementation, the drafting of a 'Strategy of Innovation' has been foreseen, including plans for a centre of innovation, and this action will further complement the current Strategy.

¹ See for instance, Milica Uvalic, *Science, Technology and Economic Development in South Eastern Europe*, UNESCO-ROSTE Science Policy Series N°1, 2005

CHAPTER 1. Overview of the present situation

1.1. Reform hitherto in the STI system

Albania is a small country, both physically and in terms of population size, and has relatively low levels of income, even after two decades of rapid growth. While progress is visible in restructuring of the economy and productivity growth, competitiveness is still low and based on factor (labour) costs rather than high value added products or services. There are only about 750 medium and larger companies in the country, and the sectoral composition is heavily skewed towards low technology activities (agricultural employment remains relatively high), while exports are low in both absolute and relative terms. To assist a structural adjustment towards more knowledge intensive economic activities, an effective STI policy is necessary to complement other measures supporting economic modernisation.

In 2006, the Albanian government undertook a deep reform of the scientific research system. The prime minister nominated an expert group from the academic community, which, based on a deep assessment of the research system, drafted a platform for reform. The recommendations of the expert group were analyzed by the Higher Education and Science Council (KALSH), and it was on this basis that government took several decisions for reorganisation of Albania's network of scientific research institutions.

The main outcomes of this reform are summarized as follows:

- a) the Academy of Sciences of Albania was re-organised according to the model of many other European countries: it now operates through a selected community of scientists organised in sections and no longer administrates research institutes
- b) the research institutes of the Academy were detached from it and integrated into the higher education system; some institutions are now affiliated to line ministries, others to the universities

The institutions were established or re-affiliated as follows:

1) three inter-disciplinary research centres:

- Inter-university Centre of Albanologic Studies
- University Research Centre of Energy, Water and Environment in the Polytechnic University of Tirana
- Geo-Science Centre in the Polytechnic University of Tirana

2) two new faculties:

- Faculty of Information Technology in the Polytechnic University of Tirana
- Faculty of Biotechnology and Food in the Agricultural University of Tirana

3) a new centre and new department (as part of the Faculty of Natural Science of the University of Tirana)

- Applied and Nuclear Physics Centre
 - Biotechnology Department
- c) Research Institutes (RIs) belonging to line ministries were re-organised and twelve Technology Transfer Centres and Agencies were created, having as their main mission the transfer of technologies and knowledge with technical support

to policy-making in the relevant field.

1.2. Science system and its component institutions

The science system in Albania includes the higher education, scientific research, development and knowledge and technology (innovation) institutions. As such it includes not only the public and non-public institutions of higher education and basic research, but also entrepreneurs acting in the field of research, development and innovation. The reforms undertaken in the field of higher education and basic research, first and foremost, are targeted at integrating these two systems, which so far have been entirely separate from one another, and which should be innovative and efficient for the conditions of a small country with limited financial resources.

a) The higher schools are academic research institutions, which, according to the higher education strategy (2008) ensure tertiary education, scientific research, development and transfer of knowledge and technology. The duration and level of scientific research in the various universities varies. Currently, Albania has eleven higher public schools and 17 private higher schools. The latter are at a young age – the first opening in Albania only six years ago. However, some of these have shown potential even in the field of research.

b) The national research centres are research-oriented academic institutions whose mission is to carry out scientific research, to educate and deepen university education in the second and tertiary circle of studies, to develop and transfer knowledge and technology. The Albanologic Study Centre has been established based on the re-organization of the Albanologic Institutes of the Academy of Sciences.

The higher schools and research institutions that mainly deal with scientific research and have sufficient human capacities should build research–academic groups as basic units for realising research operating within the respective department or faculty. The new Law on Higher Education in the Republic of Albania provides the establishment of such a structure.

In the public schools that have more limited capacities for research, it is more important to support the establishment of Regional Development Centres, where researchers of various faculties and departments cooperate through projects for carrying out important studies for the region. According to the higher education strategy, the establishment of these centres should be supported by an initial promotional fund.

c) Public Centres/Agencies of development and technology transfer have the mission of carrying out studies and development projects and of transferring knowledge and technologies in the practice of product and service delivery. The following centres/agencies operate in the relevant line ministries:

- six centres/agencies in the Ministry of Agriculture, Food and Customer Protection
- one agency in the Ministry of Environment, Forests and Water Administration
- one centre in the Ministry of Tourism, Culture, Youth and Sports
- two centres/agencies in the Ministry of Economy, Trade and Energy
- two centres in the Ministry of Public Works, Transports and Telecommunication.

d) Centres/Agencies/institutes and other private entrepreneurs dealing with research, development, technology and knowledge transfer fields. This chain of the system is still in its first steps of development in Albania, but the development trend is very positive. Some similar, private units also exist in the form of institutes or NGOs with a clear profile of competencies in this field, in particular in the field of analysis of social and economic problems, serving as a basis for policy making. This segment

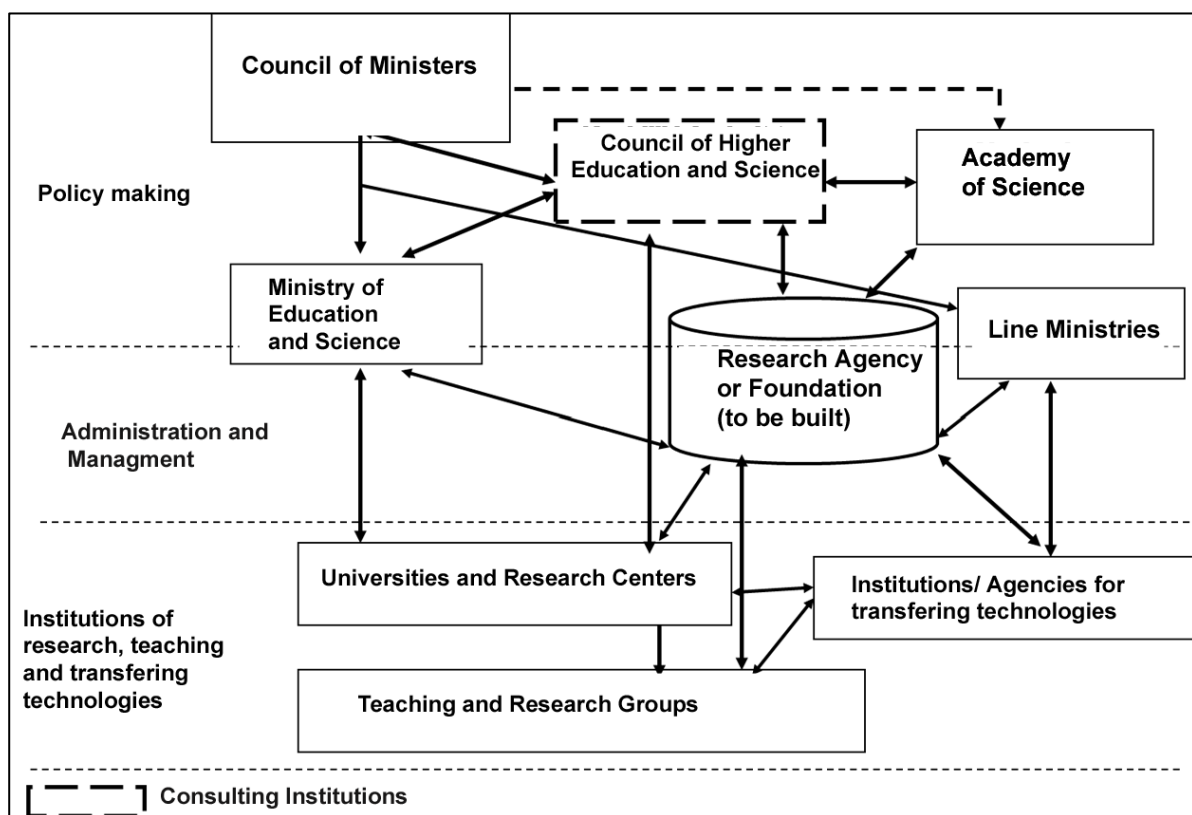
of the research and development system has provided good support for the policy-making, executive and legislative bodies.

Meanwhile, private entrepreneurships in the field of knowledge and technology transfer in the IT sphere have also increased. However, initiatives in other important fields for economic and social development of the country are scarce. For instance, there is little private initiative for studies in the field of energy, agriculture, molecular biology, biotechnology, natural resources and other related fields.

In addition, it should be highlighted that development of private entrepreneurship in research, development, technology and knowledge transfer has, in all cases, been speedier than that of public institutions, because of the absence of stimulating financial mechanisms for researchers and genuine public institutional reform of the science system.

The current science system structure in Albania is shown in Scheme 1.

Scheme 1. Science system in Albania, following the institutional reform of 2008



1.3. National STI system capacities and performance

The capacities and competence to manage both fundamental and applied research in Albania are limited and, in general, far from the standards enabling co-operation and integration into European or international programmes. Equally, the scientific infrastructure is, by all accounts, outdated and inadequate to support quality research. There is a need for a sustained programme of investment to bring scientific equipment and facilities to a minimal level of quality for teaching purposes, across all scientific fields, and to develop new and strengthen existing research specialisations with a view to national and international co-operation. An initial investment of \$4.9m has been made with the support of the World Bank. However, the amounts invested remain small and have been focused on teaching laboratories. From a cost-efficiency

point of view, there is a need to align a national scientific infrastructure investment plan with investments being made at a regional (Western Balkans) level to permit sharing of equipment and infrastructure.

At the present, it is difficult to make precise statements about the level of investment in favour of STI² the performance of the public, academic or business organisations performing research or about the functioning of the ‘innovation’ system in general. R&D and innovation statistics are not collected currently to international (OECD, Eurostat or UNESCO) standards². However, a first questionnaire survey to public and academic institutes has been launched, in the first semester of 2009, and a business R&D and innovation survey will be launched by summer 2009, both with the support of UNESCO.

Nevertheless, in terms of investment, the estimates, corroborated during discussions held for the preparation of the strategy, suggest that the annual Gross Expenditure on R&D (GERD) will be close to 15 million Euros in 2009, i.e. below 0.2 per cent of GDP. This expenditure is almost exclusively funded by the public sector and by foreign sources. Government is committed to increasing funding, and the 2009 budget for higher education and scientific research is 2.2 times higher than that for 2005. For the first time, the higher education budget reached \$100 million in 2009, of which \$6 million are for ‘institutional funding’ of scientific research (compared to \$800,000 in 2005)³.

At the present time, the only ‘research-funding’ programme is a small scale competitive funding programme (currently 132 projects for a total budget of \$5m, implemented over 2–3 years) run by MES. As noted above, the World Bank has also funded the equipping of teaching laboratories. Moreover, through the medium-term plan (2008–2009) of the Brain Gain Programme (co-financed by UNDP), the Albanian Government has for the first time mobilised funds from the State Budget and opened 550 vacancies in higher education and scientific research institutions. To date, 82 assistants and lecturers with a MA or PhD degree have been qualified and appointed, on the basis of open competition, in the public and private universities. For the first time, the Albanian government implemented in 2007 a programme for PhD studies, ‘The Excellence Fund’, which supports the best PhD candidates to partially or fully complete PhD studies abroad. A total of 45 PhD students were supported by this fund during 2006–2007.

Government funding of research may also be carried out through a number of other line ministries and public organisations, directly or indirectly involved in research and innovation policies or activities, or both. These, in particular, include the following:

- The Ministry of Agriculture funds activities in the field of applied research and technology transfer, in specific areas, mainly in response to the needs of the farming community. The activities are carried out by five Centres for Transferring Agricultural Technologies (QTTB) dependent on the ministry. The ministry has a consolidated extension programme implemented through co-operation with the QTTB and other research structures⁴.

² *Enhancing Science Policy and Management in South Eastern Europe Science and Technology Statistics and Indicators Systems*, UNESCO-BRESCE Science Policy Series n°3, (2007)

³ Press Statement of the Advisor to the Prime Minister on Educational Matters, Prof. Myqerem Tafaj, 6 December 2008

⁴ QTTB are new structures, under the Ministry of Agriculture, Food and Consumer Protection, established as the result of restructuring of the former research institutes of the ministry (Decision of the Council of Ministers No. 515, 19.07.2006)

- The Ministry of Defence envisages the intensification of R&D activities for security and defence as part of a long-term plan for the Development of Military Forces 2020. Moreover, NATO membership implies involvement in the Science for Peace Programme⁵.
- The Ministry of Health has its own research agenda related to the improvement of health services.
- The Ministry of Economy is planning to establish a Centre for Innovation that would provide services to enterprises related to innovation and technology transfer.

Finally, limited data on scientific publications and patent indicators confirm the low level of output of the research system. There are no data or studies available that allow any estimate of the extent of innovation activity (innovation expenditure, etc.) or outputs in the enterprise sector (e.g. sales from new products or services, etc.). Innovation surveys in other ‘catching up’ countries tend to show a relatively high rate of investment in information and communication technologies, innovation through acquisition of embodied technology and organisational change rather than formal R&D.

A similar picture could be expected in Albania with most enterprises requiring first and foremost advice on best-available technologies and related organisational change in production process and training of staff. A limited number of medium-to-larger firms, e.g. in the agro-food sector, potentially becoming actors in terms of investment in product development R&D. Until the university sector develops the required capacities and infrastructure to carry out more advanced research, there will be few opportunities to develop high-tech spin-off/start-ups and investment in high-tech incubators, etc.

1.4. Legal framework and decision-making process

The legal framework governing STI issues has evolved in the last few years, notably through the adoption of the 2007 Law on Higher Education and the revisions to the law on the Academy of Sciences. A 1994 Law on Science and Technological Development remains in force as well.

The 1994 Law created a Council for Science Policy and Technological Development (CSPTD) as the body that defines and proposes a Science and Technological Development Policy to be approved by the Council of Ministers, reviews it, and takes decisions on the National Programmes. By law, CSPTD is chaired by the prime minister and has up to 15 members from the scientific community and governmental institutions. However, this Council has never functioned effectively or been given the resources (e.g. a staffed secretariat) to fulfil its mandate, as noted in several reports and in discussions for the preparation of the strategy. The 1994 Law should be repealed or revised to bring it in line with international standards, notably taking into account opening of national programmes in line with EU priorities, State aid rules for R&D and innovation funding, researchers mobility, etc.

The 2007 Law on Higher Education introduced greater flexibility and objectivity in the funding of universities, while the Higher Education Strategy sets out a number of ambitious goals to improve the functioning of the university sector. The primary focus

⁵ www.nato.int/science/studies_and_projects/country-reports/ALBANIA-Country-Report-Feb09-update.pdf

of the HE Strategy is on improving the quality of teaching at undergraduate and masters levels, but it also formulates a number of orientations concerning academic research, including doctoral and post-graduate studies. For instance, the HE Strategy highlights the very low level of numbers of students in programmes of science, mathematics and engineering (6% compared with close to 25% in many countries in the region), or the need to bring the standards of PhDs into line with those of the European Higher Education Area. Such issues are clearly fundamental for the future potential of the Albanian research system to carry out high quality research to international standards. Hence, the development of research potential in more fundamental and academic research will need to adopt a phased approach, carefully considering investments in infrastructure or research programmes against not only 'good plans' (e.g. research fitting with national strategic priorities) but also realistic capacities to carry out the research (e.g. availability of qualified human resources).

The Council for Higher Education and Science (CHES) was created by a 2006 amendment to the 1999 Law on Higher Education. CHES was set up as an advisory body to MES and to the Council of Ministers. Its main role is to advise on strategies, policies and priorities (e.g. each university's proposed five-year strategic plan to assess its compatibility with this Strategy). The HE Strategy proposed to establish a small, high level (and permanent) Research Strategy Group (RSG), under CHES, responsible for developing a research strategy and for keeping it under review. The extent to which CHES-RSG duplicates the role of CSPTD needs to be considered, though at the present neither body is actually providing advice on STI priorities to government.

As noted above, a major change in the research system occurred through the amendment of the Law on the Academy of Sciences⁶ resulting in the integration of the former institutes of the Academy of Sciences into the major public universities since 2007. As in other European countries, the role of the Academy is now limited to a representative and advisory role concerning science and no longer the carrying out of research per se. Aside from advisory functions, the role of the Academy continues to include management of scientific publications, and hence bibliometrics on Albanian language journals, as well as the promotion of science through conferences or awarding of prizes.

The integration of the former Academy of Sciences research institutes into the university sector and the development of a research strategy within each institution will clearly take time. During consultations for the drafting of this strategy, it was clear that the rectors, vice-rectors, deans and heads of departments in the three main universities are only now beginning to develop the foundations for the development of a strategic management of research. To be successful, this process will require technical support, 'coaching' and resources if the academic research base is to be structured to become effective in terms of research and financially sustainable through a mix of national public funds, international donors (including charitable foundations supporting research) and, in the medium term, with revenue from contract research and other services provided to enterprises.

At the present time, 'research policy' is administered through the Directorate of Science at MES. The financing of R&D activity is conducted through institutional funding by the government, programme financing through MES, programme financing on the framework of bilateral programmes, and international collaboration.

⁶ Law N° 9655 of 11.12.2006 as amended on 27.12.2007 and 07.07.2008

The latter has been introduced recently and is largely financed by donor funding, is thinly spread and may still be regarded as at a pilot stage. While there have been visible efforts to concentrate resources and introduce competitive criteria this policy has not been generalised yet.

Currently, MES is not equipped either to fulfil a policy-making and scrutiny role or to implement the current, and certainly not, the future funding programmes foreseen by this strategy. The policy-making capacities of MES in the field of research are insufficient, even if some staff have been involved in Western Balkan research policy co-operation initiatives. Moreover, the Directorate of Science has been without a head and the four to five staff members struggle to deliver the current limited programme of funding to applicants (delays in selection and annual disbursement rounds make the process unsatisfactory for all concerned).

1.5. Albanian international and European cooperation on STI

The international dimension is crucial in order to rapidly integrate into the national research system the principles of excellence and competence in STI that enable access to international co-operation and funding in this field. Albania has already experience in international cooperation in the broader fields of socio-economic development and higher education, through, e.g., EU CARDS, Tempus Higher Education, World Bank support for Higher Education, an education development loan via the European Investment Bank's Innovation 2010 initiative, and multilateral cooperation with the United Nations (UN) family agencies (UNECE, UNESCO, UNIDO, UNDP). Co-operation in the specific field of STI is as yet more limited, though a number of bilateral research co-operation agreements are important symbolically if not financially in creating the basis for exchange and partnerships. Full participation in the EU's 7th Research Framework Programmes for R&D (since 2008) is a first step in the gradual integration into the European Research Area (ERA) and opens up the prospect of additional funding flowing into the research system in the medium term. Moreover, some other international organisations, such as UNESCO (support for R&D statistics and science policy expertise) and the World Bank, currently through its Higher Education Loan, are also providing support. The potential for sourcing future support for implementing the strategy through the EU's Instrument for Pre-Accession (IPA) will be examined and optimised. This strategy seeks to provide a framework through which the multilateral donors forum and bilateral cooperation can contribute in a structured manner to the strengthening of Albania's R&D capacities.

A high priority in terms of internationalisation is the gradual adoption of a process similar to that of the EU Member States 'national reform plans', whereby the Albanian Government would make a commitment on long-term priorities in the areas of research and innovation policies. This includes a quantitative estimate of GERD/GDP but also the identification of challenges and policies and to address these in the short and medium term.

Countries including Estonia, Ireland and Slovenia can be used as benchmarks for Albania: on the one hand they are of comparable size and on the other they have progressed very fast both in economic and research terms. Ireland, in particular, once the poorest and technologically most underdeveloped EU15 member state, evolved rapidly into one of the richest with considerably more internationally competitive research capabilities.

At the same time, if Albania relies primarily on foreign funding sources alone, and in particular the very competitive structure of the EU's 7th Research Framework Programme (FP7), this will lead to considerable disappointment as funding decisions

are difficult to anticipate. On the other hand, relying exclusively on national funding and expertise is unlikely to lead to new frontier research, as the size of the national scientific community is too limited to provide for the whole spectrum of skills and experience needed. The virtuous circle – reinforcing competitive advantages in scientific research and creating the competence to access funding from FP7 – will help to reinforce national excellence.

CHAPTER 2. Vision, priorities and strategic goals

2.1. Vision

International experience suggests that it is important that there exists broad cross-party parliamentary consensus on where Albanian science should and could realistically be in 8–10 years time (some countries also use 20-year horizons and systematic foresight exercises) and to what broader socio-economic ends an additional appropriation of public funds for science will contribute.

The vision of science, technology and innovation is anchored on the single most important resource for a knowledge economy: people. By 2015, the government will seek to ensure that, in a selected number of fields, Albanian scientists will be recognised as undertaking and producing international quality research.

Achieving such a vision requires the following:

- improvement of research infrastructure (including for university education at BSc, MSc, PhD levels)
- creation of scientific excellence in selected research fields
- education and retaining of, or attracting, qualified people into the Albanian research system
- increased public understanding of science and an improved awareness of the role of innovation and new technologies for society and economy.

This can only happen through increased and targeted funding, appropriate and modern policy management and gradual integration of the research system into the European Research Area (ERA).

In line with the National Strategy for Development and Integration (NSDI), which adopted a limited number of priority sectors (tourism, agriculture and agro-processing industry and exports), the STI Strategy will focus on a few priority fields enabling concentration of the scarce resources available for core groups of researchers able to attain a level of international recognition and excellence. This will not exclude other fields, since a minimum capability in basic or applied research is needed to keep tertiary education teaching up-to-date or to provide services to enterprises or to respond to social needs. However, concentration is a prerequisite for excellence, as is recognised at the European level.

Internationalisation and integration into ERA and the building of national competences are mutually reinforcing. Albania is committed to playing as full a part as possible in European level research programmes and initiatives, in line with its financial means and strategic interests, and promoting participation of Albanian researchers in the EU's Research Framework Programme and integration into other European research initiatives (COST, EUREKA, etc.).

In addition, the business sector will need to be encouraged to modernise and improve its capacity to co-operate with and commercialise the results of research carried out nationally, as well as bringing technologies up to international standards through purchase of advanced machinery, etc., including related organisational change and training. Complementary measures to support Albanian companies in this process will be required, including support to innovation management and strategies in enterprises and manufacturing advisory services and technology transfer. In this respect, EU IPA funding will be mobilised wherever possible and access for Albania to the Competitiveness and Innovation Programme (CIP), including Enterprise Europe

Network funding, will be pursued to strengthen know-how and capabilities to support innovation in enterprises.

In order to gradually increase co-operation amongst the various elements of the 'Innovation system', it will be important to work with organisations representing specific sectors of the economy to enable them to motivate and raise awareness of their member firms about innovation. Similarly, training needs to be associated to the STI Strategy, in particular by building relevant basic skills and encouraging those enterprises with technological know-how or R&D capacity to work with higher education institutes on defining undergraduate curricula and at a later stage post-graduate industrially relevant research.

As a consequence, the vision of the Albanian STI system adopted by this Strategy is:

“reaching of a critical level of research to support university education in its three levels (BSc, MSc and PhD) as well as achieving excellence in a small number of priority areas by 2015, through the concentration of national and international resources and in close cooperation with Europe, as well as through the provision of systematic support for innovation and technology transfer to cater for the needs of the productive sector”.

2.2. Research priorities

Selecting priority fields of science is a very challenging task since the process implies designating a few key priorities on which financial resources are focused, while there is a natural pressure from actors outside those assigned priorities to redesign measures and include more areas into the priority budget. International experience indicates that the best approach when assigning priorities is to proceed with a combination of a bottom up and a top down priority setting.

Orientation of research is normally done through a number of national research programmes that target fields selected as a priority due to their socio-economic relevance. Albania's NSDI underlines the importance of modernising economic sectors such the agro-food industry and tourism, as well as the strategic importance of energy, environmental and water resource management.

In parallel, proposals for prioritisation in fields of research have been made by the stakeholders of the research system in areas such as agriculture and food, information and communication technologies, public health, Albanology and humanities, natural resources, biotechnology, biodiversity, defence and security.

Strategic governance of the research system and informed and objective selection of national priorities will require the development of capacities to carry out forward-looking studies (foresight, technology road-mapping, technology assessment) by or at the request of the consultative bodies advising the government and parliamentary committees.

Equally, it is important not to stick to only top down pre-selected topics, nor overly broaden them, unless additional funding can be assured. A structuring of research potential through competitive calls for proposals that incite researchers to work together in inter-institutional and inter-disciplinary modes can allow for 'own-initiative' proposals to emerge from the research community.

A principal criterion for selecting research themes will be the demonstrated ability and potential to create a critical mass of excellence in the form of groups of researchers working together on an agreed medium-term (five–seven year) research 'road-map'. Based on international experience, the size and budgetary constraints of

the Albanian research system allow for the creation of four or five centres of excellence, initially over a five-year period but realistically the process could take up to a decade for the centres to reach maturity. The development of such centres of excellence will be critical for improving the credibility and visibility of Albanian research within the ERA, and thereby maximise the inflow of funds from EU research programmes (FP7, COST, EUREKA, etc.). The procedure for the development of such centres of excellence is set out below.

2.3. Goals and milestones

The above-mentioned vision and priorities need to be translated into concrete goals and milestones in order to allow for a systematic monitoring of progress and to help achieve the targets of the programme. The small share of R&D in the higher education sector is mainly due to the lack of direct financing and human capital available today. It is unlikely that the private sector will begin to invest in formal R&D in any significant way (in top performing countries the private sector contributes 2/3 of the R&D finance) but it will be a goal to develop structured product development and innovation activities in a minimum number of firms.

The strategic goals can be summarised or quantified, or both, as follows:

1. ***Increase public spending on research to 0.6% of GDP by 2015.*** A number of observers consider this target to be too modest. However, it would represent a significant increase compared to the current situation. Equally, it would be a higher relative share than a number of the less developed EU countries, other countries in the Western Balkans, and many emerging economies⁷.
2. ***Increase the share of gross expenditure on R&D from foreign sources*** notably from the EU (FP, etc.) and international donors to cover 40 per cent of all research spending in the years 2010–2015.
3. ***Create four or five Albanian Centres of Excellence in Science (ACES)*** including dedicated laboratory equipment or workspaces that could be used for new technology based firms (pre-incubation, testing, certification, etc.).
4. ***Double the number of researchers***, through ‘brain gain’ incentives and training of new researchers (establishment of graduate schools; train 500 PhDs). This will involve the creation, in synergy with the Higher Education Strategy action plan, of up to three new ‘graduate schools’ (or doctoral programmes) in Albanian universities. These graduate schools should be in the priority areas selected by government in consultation with the national STI council or be linked to the selected centres of excellence, or both.
5. ***Increase innovation activity in 100 companies*** (this figure may be revised once the results from the first business RTDI survey are published) through investment in R&D through own laboratories, or via consortia with the academic RIs or in partnership with foreign partners.

⁷ See for instance Figure 4 in UNESCO’s Fact Sheet (2007) for a comparative perspective: http://www.uis.unesco.org/template/pdf/S&T/Factsheet07_No%20%205_ST_EN.pdf or the Global Innovation Scoreboard 2008: http://www.proinno-europe.eu/admin/uploaded_documents/EIS_2008_Global_Innovation_Scoreboard.pdf

CHAPTER 3. Policies to be pursued

3.1. Structuring policy implementation

It is proposed to structure the policy intervention to be developed over the six year period from 2010 to 2015 around **five main programmes**, in addition to the existing baseline funding, on which efficiency savings may be made, as follows:

A. *Research Infrastructure Fund* with the objective of improving the equipment and facilities available in the public and university research institutes to a level permitting research projects to be executed to international standards. This programme will be open to bids submitted by either individual research institutes or by a university as whole.

- Examples include Croatian Research Equipment, Estonian R&D Infrastructure programmes, and, on a different financial scale, the Irish Programme for Research in Third-level Institutes and Polish support to joint research infrastructures programmes.

B. *Creation and Development of Albanian Centres of Excellence in Science (ACES)* with the objective of developing four or five centres of excellence bringing together a minimum of 20 researchers (principal researchers, post-graduate researchers and PhD candidates) from at least two separately affiliated research institutes;

- Estonian Science Excellence Centres and the Slovenian Research Group Financing programmes may serve as models.

C. *Research Eagles Grants Programme* aimed at increasing the number of Masters and Doctoral graduates in science and engineering fields as a priority, carrying out post-graduate research or projects in Albania. This measure should be linked to the development of doctoral studies (schools) under the HE Strategy. The programme will fund both young researchers to undertake PhDs in Albania (as soon as doctoral programmes reach international standards) and mobility to pursue PhD training in the EU27, as well grants for returning researchers from any foreign country (including stipend and relocation support).

- Lessons should be drawn from the pilot experience of the ‘Brain Gain’ programme, and a range of schemes in EU can be used as models, e.g. the Croatian Brain Gain, the Hungarian Eötvös Scholarship, Slovenian Young Researchers or the Flemish Odysseus programmes.

D. *National Technology Programme* aimed at bringing together consortia of academic research institutes with the private sector or other public sector organisations (e.g. water or energy utilities) in order to develop a medium-term programme of applied research with a social or economic impact. The aim would be to launch at least one such programme in the period 2010–2015 and two or three more by 2020. For this reason it is important that government set up a special fund in order to stimulate companies in the fields of research and innovation.

- Experience of the Austrian technology programmes could be adapted to the specific context of Albania.

E. *Science Promotion and Education Programme* aimed at promotion of science towards young people and funding of a limited number of graduate schools to boost PhD numbers. Various science mentoring and ambassador schemes or ‘innovation awareness’ initiatives in the EU27 could serve as models. The Albanian Academy of Sciences, according to its new mandate, should be involved in this programme.

All of the above programmes will be administered on the basis of competitive calls for projects or applicants (in the case of individual grants for researchers mobility). For example, the centres of excellence programme will adopt the following procedure:

1. launch a call for cooperation among research teams in the country (inter-institutional), who will present first an outline proposal indicating mainly the research theme. The proposals will be evaluated based on a) the potential strategic relevance of the research for Albania, and b) the critical mass of researchers being brought together from at least two research institutes/universities
2. select preliminary proposals to receive a grant to carry out a feasibility study and submit a full proposal for funding. A group of researchers and a strategic research plan for cooperation and targeted scientific achievements will be formed
3. select full proposals based on the quality of the strategic research plan and a number of specific selection criteria (publication record, relevance for national productive capabilities, international prestige, e.g. partners in EU countries, number of teams participating, milestones for attraction of international funding, links with graduate training, etc.)
4. use an international panel of experts for selection
5. assure funding for six years for labour costs (including overheads), infrastructure (buildings), equipment, training (including study trips) related to the strategic research programme of the centre
6. be subject to an international peer review after three years and a full evaluation at the end of six years.

Moreover, the design and implementation of these programmes will require a considerable strengthening of policy-making and programme management capacity. There is a need to mobilise funding, including support of the EU or other donors, for the establishment and operation of a research programme management organisation (see section 3.2. below). The research programme management tasks will include administering the calls for proposals and project funding for scientific and applied (industrial) research and evaluating and certifying research institutes eligible for participation in the programmes.

The above set of programmes will not specifically target knowledge diffusion (technology transfer) or research commercialisation activities except as an expected impact of the research (e.g. the centres of excellence or technology programmes will ultimately contribute to developing or adapting new technologies). This is intentional. Evidence suggests that most Albanian enterprises are not in a position to begin co-investing into applied research and development or contracting of advanced services. At the same time, the primary need is to build up a science base able to develop research excellence that may lead to results worthy of proof of concept (prototyping, etc.) investments. However, this is unlikely to occur within the initial five-year period.

Technology diffusion and transfer activities are, however, crucial in a transition economy such as that of Albania. Evidence from past reports and discussions held for preparing this strategy suggest that many of the researchers in both the former Academy RI system and the universities are actively involved in 'applied research' or service provision related to specific economic or societal needs. There remains a need

to professionalise and structure this flow of services towards enterprises and formalise, over time, the revenue stream such services can generate for the research institutes.

Equally, there is a need to ensure that Albanian enterprises are purchasing the best available technologies as part of their upgrading plans and to train workers in such technologies. Indeed, the need is clearly present for the creation of a specific government funding measure to stimulate the companies in the field of innovation and transfer of new technologies. In this context, international experience shows that it is most effective to twin such financial support for technological upgrading with advisory services (the UK Manufacturing Advisory Service is a good example). The Ministry of Economy's proposal to develop a National Centre of Innovation and Technology Transfer is hence clearly complementary to the proposed programmes of the STI strategy. Ideally, this could follow good practice examples from the network Business and Innovation Centres (BIC) and Innovation Relay Centres (IRC) developed in the EU over the last decade. The BICs and IRCs are now combined in the Enterprise Europe Network (EEN), funded under the EU Competitiveness and Innovation Programme; the Albanian Centre of Innovation should seek early admission and support from the EEN programme.

3.2. Strengthening policy-making capacity

Strategic governance of research policies requires a range of skills, capabilities and organisations. At a minimum, the research policy and funding system need to be able to do the following:

- recognise the strengths and weaknesses of the system (policy intelligence)
- define the focus and topic of political action (agenda setting)
- ensure co-ordination of activities beyond the research policy field (horizontal linkages to other policy fields)
- implement policies cost-effectively
- learn from past experience (evaluation) or good practice elsewhere
- make adjustments to the whole policy cycle.

Clearly the current system in Albania is far from being able to meet these minimum conditions. There is a need for profound re-organisation and a clearer attribution of tasks. The Albanian Government is committed to improving the capacities and skills required to ensure the management of the detailed design and implementation of the STI strategy. The required skills can be broadly classed as follows:

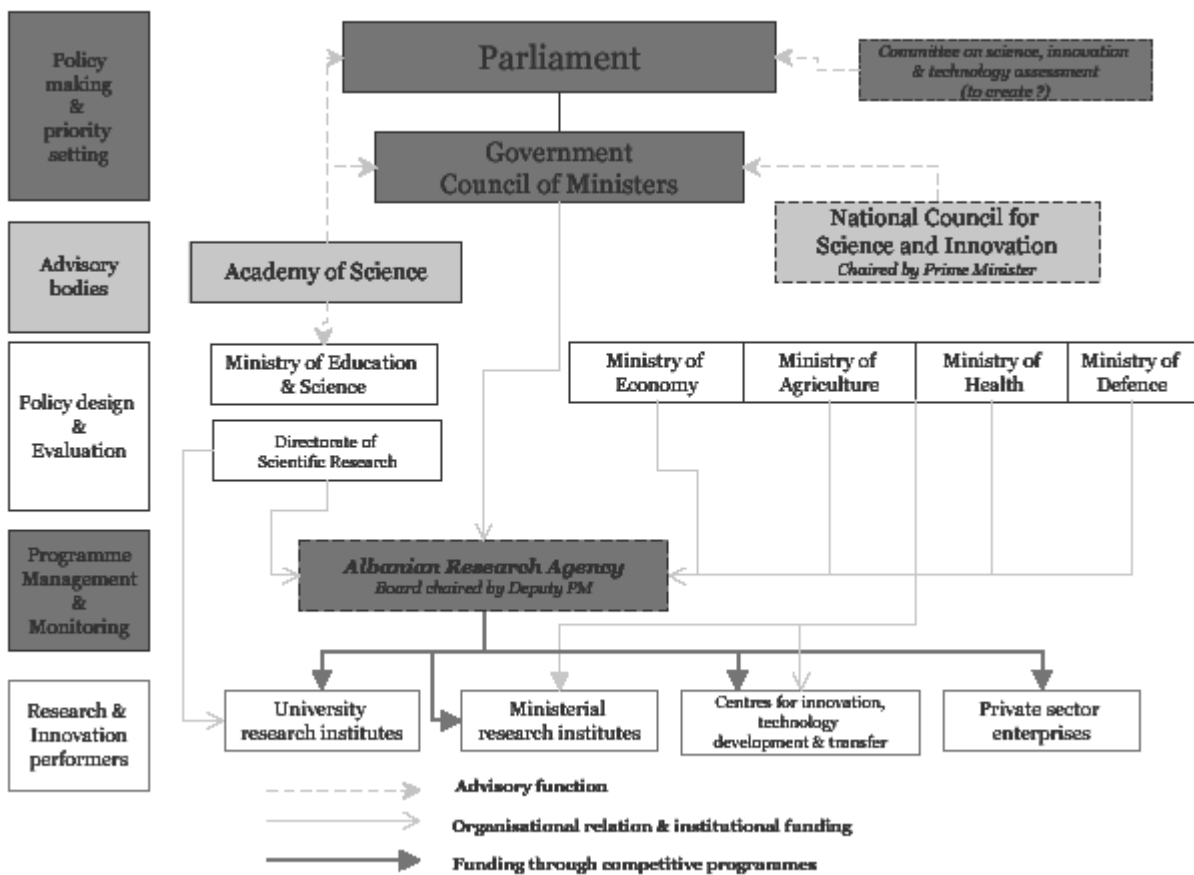
- strategic and operational management of research and technological development (RTD) programmes
- systems and methods for carrying out the selection, monitoring and evaluation of such programmes and of projects funded
- techniques for appraising and accrediting of management and activities carried out by research and technology organisations (public, academic and potentially private), which are the direct beneficiaries of the programmes.

In terms of priority setting and overseeing and adjusting the research policy cycle, there is a need for a politically credible, National Science and Innovation Council that should be chaired by the prime minister and be composed of a well-balanced group of stakeholders: one third each from government, academic research and the business

community and society. *The present Strategy therefore proposes that a single National Science and Innovation Council be established and that a dedicated secretariat of at least two experts should be created to support its work, with a budget for commissioning studies or policy learning (study trips, etc.).*

Secondly, the functions of research policy intelligence (analysis and R&D statistics, etc.), policy making, ensuring horizontal linkages to other policy fields and evaluation of research policy need to be brought together in a department of government with a clear mandate and sufficient resources. A revamped Department of Science within MES could play this role and be staffed by four to six qualified graduates supported by a programme of training and technical assistance.

The diagram below sets out a simplified overview of the Albanian research system based on the assumption that the option of creating an Albanian Research Agency (ARA) is pursued. The funding flows assume that MES will delegate management of competitive funding programmes to ARA and foresees that other ministries could do the same (e.g. for a national technology programme for the agro-food sector, the Ministries of Education and Science, Economy and Agriculture could all contribute funds via ARA). If the agency integrates activities of the Ministry of Economy related to innovation (e.g. the proposed Centre for Innovation) then the name could reflect this scope and be the Albanian Research, Technology and Innovation Agency.



The proposed NCSI (replacing CSPD) would be chaired by the prime minister, and could work through the option (as in Estonia) of two sub-committees, one for business innovation advising the Minister of Economy and the other, the Council for Higher Education and Science, advising the Minister of Education and Science. The diagram also includes a proposal for the Albanian Parliament to have a Committee on Science, Innovation and Technology Assessment. Most European parliaments have created a

capacity in technology assessment to assist them in decision-making where there is a scientific or technological issue. The advisory role of the Academy of Sciences is reflected in the diagram. The Academy could also be a recipient of funding from the ministries or ARA for specific tasks related to scientific publishing, promoting public understanding of science, promoting scientific careers, library functions, etc. Such funding lines are not drawn for the sake of visual simplicity.

3.3. Creating an appropriate capacity for programme management

The process of implementation of the STI strategy is conceived as a chain of **performance contracts**, which will link the progress and results of the individual projects (funding awarded to research institutes, individual researchers, enterprises, etc.) up through the programmes management and back to the policy-level in the ministries and government. Ultimately, the effectiveness of the STI policy will be scrutinised by parliament (and hence the electorate). For the whole chain of performance contracts to work well, high quality is needed not only in the work done at each level but also in the agreements that link levels together.

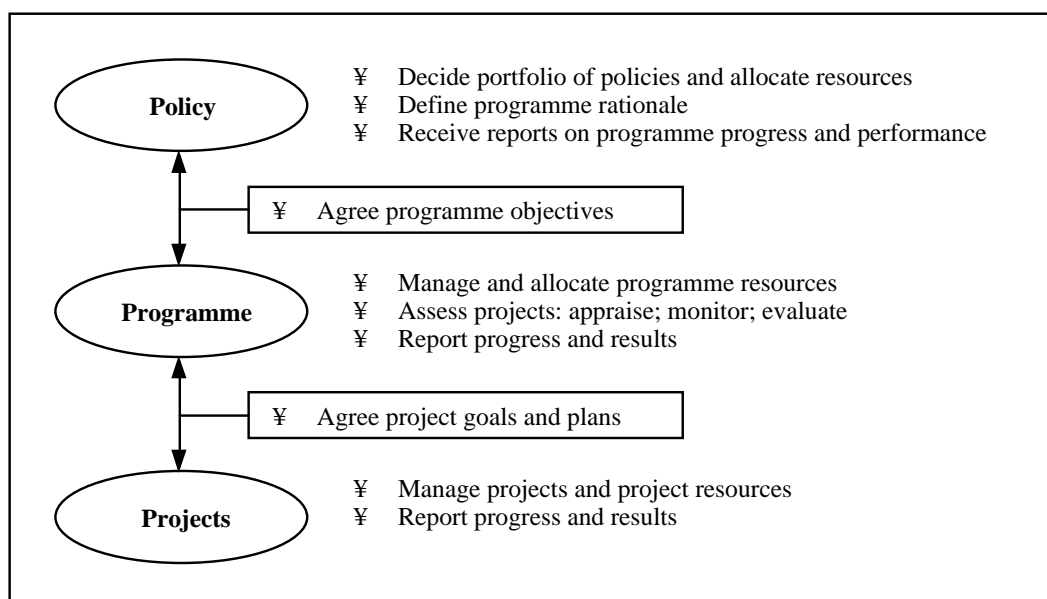
Programme managers look after and allocate the programme’s resources to a range of projects. This involves undertaking the following:

- appraising project proposals
- selecting projects to fund
- monitoring projects to ensure the progress planned is made and the desired results achieved
- evaluating the quality of the project implementation.

In order to keep the policy customers satisfied, programme managers need to report progress and results.

In the same way that programme objectives represent an agreement between policymakers and programme managers, so project goals and plans form the basis of agreements – often literally in the form of contracts – between programme managers and project leaders. The project level then has the detailed responsibility for project execution and for reporting results.

Exhibit 1. Programme management as a hierarchy



Evidence of programme management and evaluation from other European countries allows us to decompose the process model shown in Exhibit 1 into a large number of individual tasks. For example, the process of ‘acquiring projects’ can be decomposed as follows:

- *communicating* about the programme to potential participants
- acquiring high-quality proposals
- appraising proposals
- taking funding decisions
- establishing performance contracts with project leaders.

Each of these individual tasks is then further decomposed into a set of qualitative and quantitative **benchmarking indicators**, against which data are gathered on a programme-by-programme basis.

This logic of performance contracts raises the question of the organisation that should ensure programme implementation and the day-to-day management of research funding programmes in Albania. There is no single model that can be applied based on the European experience: different countries choose to deliver programmes through either the same government ministry that designs the policy (e.g. the cases of Italy or Greece⁸) or via specialised implementation agencies (e.g. the cases of Estonia, Hungary or Slovenia⁹).

A number of recent expert groups and working papers from Albanian experts¹⁰ have suggested the need to create an ‘implementing agency’ for research funding, notably competitive funding programmes, and as a counter-part for international and bilateral co-operation with similar research funding agencies elsewhere in Europe. There is, indeed, a trend present in the countries selected as ‘peers’ (Estonia, Slovenia), or more advanced examples including Austria, Flanders and Finland, to separate the policy-making function from policy implementation. Equally, the advantages of a more flexible agency structure able to act as a ‘contact point’ and relay for participation in the various EU support initiatives to R&D and innovation co-operation should be underlined.

Given the cross-cutting nature of the research strategy and the aim to develop over time a series of national technology programmes allied to the need to create a structure with the potential to promote Albanian science and research capacity in EU programmes, the option of an agency is reasonable. However, there should be a clear demarcation of activities and the agency should not lead to a further weakening of capacity to develop and scrutinise policy within MES.

3.4. Improving the legal and institutional framework for research policy-making and research funding

The legal framework in Albania has been set out above along with the need for overhaul of the laws relating to research, technological development and innovation.

⁸ Ministry of University and Research, Italy, or General Secretariat for Research and Technology, Ministry of Development, Greece

⁹ Slovenian Research Agency (ARRS), Archimedes Foundation (Estonia) and Hungarian National Office for Research and Technology (NKTH)

¹⁰ For example, *Reform of the Scientific Research System, Report of the Group of Experts*, headed by Prof. Tafaj, January 2006

Redesign of the overall legal framework is part of the process of Albania's integration into ERA and should include aspects related to the legal alignments required for European Partnership for Researchers (improving researchers' careers and mobility), joint programming, etc., as well as adjustment of Albanian laws to the EU's State Aid rules on R&D and innovation. The EU's IPA is clearly a prime candidate for providing technical assistance to MES and also to intervening to strengthen capacity in the national science and innovation council and other ministries with research funding activities.

The most appropriate legal framework of the proposed research funding agency has been a subject of discussion in recent years, as well as during preparation of the strategy.

Ultimately, this is a political decision. Nevertheless, the advantages and disadvantages of the possible options can be summed up as follows:

- reinforcing the Department for Science within MES to carry out both policy-making and policy implementation
 - On paper, this option is the least costly and could be supported with a technical assistance project to train and upgrade staff know-how.
 - The main disadvantages appear to lie in the difficulty to attract and retain qualified personnel within the public administration. Giving higher priority to the creation of a small but well qualified policy unit within the Ministry is a more credible goal than the development of a professional cadre of programme managers with appropriate administrative and technical skills.
- creation of an autonomous agency, the Albanian Research Agency (ARA), which will be responsible for the implementation of the strategy of science, technology and innovation, set up by a special law. This option is clearly the most ambitious and would require a feasibility study and 'business plan' for a minimum of five years operation. The Agency would operate based on a separate budget line and report to a governing board, and ideally should be representative of stakeholders (government, research system and at least one or two business and societal representatives).

The majority of Albanian stakeholders consulted and involved in the drafting of the strategy preferred the option of ARA. This, however, will require a full feasibility study and operational plan to be drafted prior to a governmental decision. The Action Plan for this strategy sets out an initial outline plan for ARA. It is important to create the capacity to manage at least the centres of excellence and research infrastructure programmes by the first semester of 2010 if these two basic 'foundation' initiatives of the re-development of the Albanian research system are to be launched in a timely manner. There is a need to mobilise bilateral co-operation funds, such as EU support through an IPA project or 'twinning' with an existing EU Research Agency, or both, to ensure optimal design and launch of ARA.

In terms of Intellectual Property Rights, Albania is not yet a member of the European Patent Organisation (EPO) and one of the few European countries not yet to have acceded to the European Patent Convention, though it has been invited to do so. Administration of industrial property is instead carried out by the Directorate of Patents and Trademarks (ALPTO) under the authority of the Ministry of Economy, Trade and Energy (since May 2006). Accession to EPC and membership of EPO should be pursued as one of the objectives of this strategy. In parallel, there will be a need to amend Albanian laws and procedures and to develop support services to

academic researchers and industrial enterprises related to both patents and other forms of IP right protection and management practices. ARA and the Centre for Innovation (proposed by the Ministry of Economy, Trade and Energy) should support improved know-how and management of IPR, respectively, for the public and academic institutes and the enterprise sector.

The integration of Albania into other European organisations also needs to be pursued, such as (full) participation in the Competitiveness and Innovation Programme (CIP), COST and EUREKA. An IPA-funded technical assistance project could develop a ‘one-stop-shop’ service within ARA acting as a National Contact Point for FP7, CIP and programmes such as COST and Eureka. This implies that the staff of the Agency should include technology specialists, financial advisors, IP experts, etc., as well as administrative staff managing funding applications.

3.5. Adopting an adequate budgetary framework

The budgetary framework for implementation of the STI strategy is set out for the period 2009–2015. All figures for future years should be considered as a working hypothesis at this stage. There is an assumption that actions in 2009 and first semester 2010 will be essentially confined to preparation of detailed programmes and creation of the management capacity in the form of ARA (assuming this is the preferred option).

Funding (€million)	2009	2010	2011	2012	2013	2014	2015	Total
Baseline funding for HEI research institutes*	7.5	8.25	9.00	9.90	10.50	11.55	12.75	69.45
Research project funding (MES)**	6.5		6.5		8		9	30.00
World Bank Research Infrastructure funding	3.3							3.30
Research infrastructure Fund	0.15	4	4	4	5	5	5	27.15
Albanian Centres of Excellence in Science (ACES)	0.15	1.5	1.5	1.5	1.5	1.5	1.5	9.15
Research Eagles Grants	0.15	0.2	0.2	0.2	0.25	0.25	0.25	1.50
National Technology Programme(s)			0.15	2	2	2	2	8.15
Albanian Research Funding Agency	0.25	0.5	0.5	0.5	0.5	0.5	0.5	3.25
TOTAL funds	18	14.45	21.85	18.1	27.75	20.8	31	151.95

*Based on press release of 6/12/08, this baseline funding from the education budget is US\$6m in 2009

**Based on information from MES concerning the current 132 projects being funded for a budget of \$5m over 2–3 years

A basic assumption is made that the Albanian Government will progressively increase national public funding for both the existing baseline funding provided under the higher education budget and the ‘small’ research projects currently managed by MES, but which could be transferred to the proposed ARA upon its creation. If the target of 0.6 per cent of GDP is to be reached this increase will need to be sustained and progressive.

The current World Bank support for teaching laboratories under the Higher Education Loan facility is included for completeness (approximately \$2.6m in 2009).

The figures in the budgetary table assume that bilateral or multilateral donors complement the available national public budget funds. Preliminary discussions with the World Bank give grounds for some optimism about the possibility of allocating funds through future loans related to higher education reform for research. Equally, given the EU’s strategic goals related to research and innovation, the future annual programmes of the EU’s IPA could be expected to support the implementation of the

research strategy. Funding for research infrastructure could be supported through regional programmes as well as potentially by the EIB.

The above figures do not include potential research funding secured via the participation of Albanian researchers or institutes in the EU's FP7 or other EU level research funding programmes.

CHAPTER 4. Evaluation and monitoring

4.1. Internal procedures and responsibilities

Policy-making needs to be evidence based. The first step to build up evidence is through evaluation that will feed into the revision and adaptation of priorities and policy implementation. Evaluation is both a culture and a demanding exercise. Countries that have decided to build an evaluation culture rapidly have done so by adopting the necessary legislation and making the budgetary provisions that allowed them to evaluate all major organisations and measures supporting research.

While there are many models to be discussed once a system is mature, it is important to start from the very beginning with some basic steps. These are outlined below.

A. *Institutional evaluation*

All organisations need to be periodically evaluated. Currently, universities are expected to be introducing evaluations in the context of the adoption of the Bologna process. Since this is going to happen, it is recommended to build into this evaluation several important questions that will help get a better overview of research performance in universities.

At a first stage, all universities and institutes should be asked to make an assessment of their own research infrastructure. The timing and exact process needs to be agreed in the context of the advancement of the Bologna process. The role of the proposed Albanian Research Agency in the evaluation of research capacities of the scientific community needs to be specified carefully to complement the work done by the National Accreditation Agency on the teaching quality in higher education.

Non-university research centres will also need to be evaluated. It is suggested to use international templates for this but postpone the evaluation to a later stage, as other evaluations need to be given priority.

The selected centres of excellence mentioned above will be carefully monitored throughout the period they receive preferential support with performance indicators used in the top performing European countries.

B. *Programme evaluation*

All future programmes with a budget larger than 1,000,000 Euros should include a provision for evaluation, normally one to three per cent of the programme budget. It is proposed to provide for a mid-term review and a final evaluation of the five proposed programmes. These evaluations should be commissioned by MES, or other line ministries funding the programmes, and will be based on the monitoring data and on-going review of projects to be managed by ARA. The mid-term reviews could involve a report by ARA on project implementation and progress to NCSI, complemented by peer review of the scientific progress. However, an *external Expert Team* should be commissioned to carry out the final programme evaluation by MES with a Steering Committee of representatives of other Ministries, etc., to ensure independence of reporting and provide a basis for revision of programmes in the post 2015 period.

Moreover, at the end of the current strategy period, it is foreseen that a full review of the strategy will be carried out; this should be commissioned by the deputy prime minister, on behalf of NCSI that will act as a sounding board for the strategy review.

C. *Organisational arrangements*

As in the initial phase evaluations can be launched individually it may be of interest to study the Austrian 'Platform Evaluation' scheme and foresee a similar forum for Albania. When more programmes will be operational an independent organisation might be necessary to coordinate evaluations (e.g. the planned Agency). However, in order to maximise the benefits and help train people it will be important to assure full transparency of evaluations and introduce the idea of discussing them and exchanging methodologies in an organised forum. The programme of evaluation of function and capacities is one that is normally located in the ministry or ministries funding the programmes and should be independent of the agency implementing them.

4.2. International benchmarking instruments

There are three major surveys that are used to create R&D and innovation indicators. These surveys lead to a set of indicators mandatory for European member states but which are also collected internationally (on a voluntary basis) by UNESCO's Institute of Statistics. They include:

1. *R&D survey*, based on the 'Frascati Manual', which gives an overview of the research inputs and selected outputs in a country. The first R&D survey is expected to run under the current UNESCO agreement. It is, however, crucial to ensure that it will be repeated at regular intervals to produce time series that demonstrate both national trends and comparisons with Europe and the Balkan region.
2. *Innovation Survey*, based on the 'Oslo Manual', is addressed to companies only and, for European member States, has a standard questionnaire and processing software. The first Albanian survey is also planned for this year, in combination with the R&D survey. While it was implemented every fourth year in the past it is now repeated every second year in Europe and it is recommended to follow this guideline for Albania as well. In particular because Innovation Surveys have a different approach from R&D surveys it is strongly recommended to run an independent R&D survey and Innovation Survey in 2012.
3. *PhD holders' survey*, which is crucial for human resources, is new for both UNESCO and Europe and the first results are only now appearing. As this survey envisages obtaining information on human resources and migration, which is one of the major topics in the Albanian vision, it is important to foresee a similar survey in the near future. Getting data about the Albanian diaspora from OECD country surveys may also be a very useful input for the national policy.

The initial work on developing statistics funded by UNESCO needs to be pursued. This should involve the creation of the capacity and know-how in the Albanian Statistics Institute to carry out such surveys and report to international statistical bodies, allied to the development of capacity within MES to analyse and use statistical data in developing policy.

ANNEXES

ANNEX 1

Action Plan for implementation of the National Strategy of Science, Technology and Innovation of Albania, 2009–15

Nr.	Activity	Description	Responsible institution	Monitoring indicators	Timeframe
1. Defining National research priorities					
1	Analysis of existing capacity within public administration and development of new skills necessary to carry forward studies (foresight, technology road-mapping, technology assessment)	The objective of this activity will be to assess the existing capacity within MES to initiate and administer forward studies. Based on the results emerging from that assessment, tailored technical assistance will be provided to ensure that the Department of Science of MES is well prepared to effectively and efficiently manage the process of design and implementation of such studies in the future.	MES	<ul style="list-style-type: none"> – independent assessment report on capacity and training needs to administer forward studies that is prepared, submitted and accepted by contracting authority – technical assistance and training delivered including quality assessment of provided services by the beneficiaries 	Sept. 09–Sept. 10
2	selection of sectors for which detailed studies will be conducted	The aim of this activity is to select strategic sectors, from those identified in the National Strategy for Development and Integration and during the preparation of the National Strategy of Science, Technology and Innovation (2009–2015), which will be subject to more detailed analysis. In the light of importance of bottom up approach in research priority setting, a decision about selection of sectors for in-depth reviews will be taken following the consultation process.	governmental decision / MES (leading consultation process)	<ul style="list-style-type: none"> – consultation process is completed and analysed – decision is made, taking into account the results of the consultation process, on the sectors for which detailed assessment will be prepared 	Sept. 09–Sept. 10
3	assessment of R&D potential and setting of priorities for strategic research sectors	Procurement contracts to define concrete fields of specialisation within the strategic sectors e.g. agro-food, energy or biotechnology, for which there is reason to believe that Albania has the appropriate scientific potential, as a precondition for concentrating research funding and building a specialised infrastructure.	MES (in partnership with other ministries on case-by-case basis)	<ul style="list-style-type: none"> – detailed assessment setting out ‘technology road maps’ for sectors under review are prepared, submitted and approved by the contracting authority 	June 10–June 11

Nr.	Activity	Description	Responsible institution	Monitoring indicators	Timeframe
2. Structuring STI Policy Implementation					
4	Research Infrastructure Fund	Inventory of existing research infrastructure and expert appraisal report. An expert appraisal will be carried out involving 1–3 international experts in research infrastructure strategies. This will serve as a baseline study for the programme.	MES (ARA)	<ul style="list-style-type: none"> – study report setting out an estimate of the overall required investment per scientific field/institute – financing decision taken to cover programme’s needs (government and identified donors) 	Sept. 09–Dec. 09
		Pre-identification projects: a call for expression of interests in the form of 3–4 page preliminary applications in a structured form, launched annually from 2010. Pre-selected projects will be awarded a grant for project preparation to prepare a full proposal.	ARA	<ul style="list-style-type: none"> – pre-selection of projects for full proposal phase by a committee involving at least 1–2 foreign experts plus Albanian scientific specialists – small grant to cover detailed project design awarded by MES/ARA 	Jan. 10–June 10
		Full proposals: submission of full proposals to confirm the relevance and feasibility of the research infrastructure investment project, including detailed project design, management and coordination arrangements, financing plan, monitoring and audit arrangements.	ARA	<ul style="list-style-type: none"> – launch of call for proposals and management of tender procedure – full proposals will be selected by expert committee composed of at least 50% foreign experts 	July 10–Oct. 10
		Project implementation and monitoring: the purpose of this stage is to procure and install the equipment/renovate the buildings and attain the expected results (utilisation rate of equipment, etc.), manage the available resources cost-efficiently and monitor and report on progress.	project coordinators, ARA	<ul style="list-style-type: none"> – publication of procurement notice and calls for tenders by recipient research institutes/universities – specific projects up and running and well managed (interim and final progress reports) – annual report on programme implementation submitted to board of ARA 	Nov. 10–June 12 (repeated annually until funds exhausted)
5	creation and development of Albanian Centres of Excellence in Science (ACES)	Programme set up: expert advice and study of similar schemes in other countries to establish programme procedures and criteria to Albanian context. Study to be commissioned with involvement of international expert(s).	MES (ARA)	<ul style="list-style-type: none"> – programme documents approved by board of ARA – financing decision taken to cover programme’s needs (government and identified donors) 	Sept. 09–Dec. 09

Nr.	Activity	Description	Responsible institution	Monitoring indicators	Timeframe
		Pre-identification projects: a call for expression of interests in the form of 3–4 page preliminary applications in a structured form, launched annually from 2010. Pre-selected projects will be awarded a grant for project preparation to prepare a full proposal.	ARA	<ul style="list-style-type: none"> – pre-selection of projects for full proposal phase by a committee involving at least 1–2 foreign experts plus Albanian scientific specialists – number of grants to cover detailed project design awarded by MES/ARA 	Jan. 10–June 10
		Full proposals: submission of full proposals covering aspects such as centre management and legal structure, partnership arrangements, detailed description of research programme to be pursued and objectives to be met (PhDs, research results, etc.), financing plan, monitoring and audit arrangements.	ARA	<ul style="list-style-type: none"> – launch of call for proposals and management of tender procedure – full proposals selected by expert committee composed of at least 75% foreign experts 	July 10–Oct. 10
		Project implementation and monitoring: implementation of the research projects, purchase of small-scale equipment or materials required for research projects, training and management activities, including reporting to ARA.	project coordinators, ARA	<ul style="list-style-type: none"> – specific projects are up and running and well managed (annual and final progress reports) – mid-term review reports (stop-go decision on further funding) by international peer review – annual report on programme implementation submitted to board of ARA 	Jan. 11–Dec 17 (mid-term review in spring 2013)
6	Research Eagles Grants Programme	Review of the outcomes of the current Brain Gain initiative and detailed design of new programme taking into account international good practice. Study to be commissioned with involvement of international expert(s).	MES (ARA)	<ul style="list-style-type: none"> – programme documents approved by board of ARA – financing decision taken to cover programme's needs (government and identified donors) 	Sept. 09–Dec. 09

Nr.	Activity	Description	Responsible institution	Monitoring indicators	Timeframe
		Management of database of open vacancies for researchers related to new research infrastructure, centres of excellence or other posts in the framework of university or research centre research strategies. Award of Young and Returning Researchers grant scheme.	ARA	<ul style="list-style-type: none"> – number of research posts opened and published – % of posts advertised filled and grants awarded 	Jan. 10–Dec. 15
		Management of annual call for scholarships for PhDs and Masters training abroad for young researchers.	ARA	<ul style="list-style-type: none"> – number of scholarships awarded – number of Masters degrees and PhDs obtained – % of students returning to Albania after study abroad 	annual call from academic year 2010–11 onwards
		Monitoring of programme progress and preparation of annual report.	MES (ARA)	<ul style="list-style-type: none"> – number of Masters degrees and PhDs obtained – % of students returning to Albania after study abroad – returning researchers staying in Albania after end of grant period – annual report on programme implementation submitted to board of ARA 	2010–2015
7	National Technology Programme	Programme set up: expert advice and study of similar schemes in other countries to establish programme procedures and criteria to Albanian context. Study to be commissioned with involvement of international expert(s).	ARA and respective ministries	<ul style="list-style-type: none"> – approval of priority field for 2–3 national technology programmes by NCSI – programme documents approved by board of ARA – financing decision taken to cover programme's needs (government and identified donors) 	Jan. – July 11

Nr.	Activity	Description	Responsible institution	Monitoring indicators	Timeframe
		Launch of call for proposals for first national technology programme and selection of projects proposed by consortium of research institutes and enterprises (including where applicable foreign organisations).	ARA and respective ministries	<ul style="list-style-type: none"> – number of projects selected for funding – number of projects involving business sector partners and/or foreign partners 	2012–2013
		Launch of a call for proposals for 1–2 more programmes based on the results of the first programme experience.	ARA and respective ministries	– <i>idem</i>	2014–2015
		Project implementation and monitoring: implementation of the research projects, purchase of small-scale equipment or materials required for research projects, training and management activities, including report to ARA.	ARA and respective ministries	<ul style="list-style-type: none"> – number of projects completing research activities – number of research results exploited commercially, IPR protected or used as a basis for further academic or applied research projects 	2012–2015
8	science, technology and innovation awareness and promotion activities	Programme set up: expert advice and study of similar schemes in other countries to establish programme procedures and criteria to Albanian context. Study to be commissioned with involvement of international expert(s).	MES (ARA)	<ul style="list-style-type: none"> – programme documents approved by board of ARA – financing decision taken to cover programme's needs (government and identified donors) 	tbc
		Procurement or call for projects for activities to foster an interest in and an improved understanding of importance of STI for the Albanian economy and society. Call for projects to be open to media companies, NGOs, schools. Specific activities of Albanian Academy of Sciences to promote improved quality of scientific publications or promotion of Albanian research results may be foreseen.	ARA	– projects selected and funded supporting promotion of STI towards young persons, business sector, etc.	tbc
		Project implementation and monitoring: implementation of media projects, purchase of small-scale equipment or materials required for research projects, training and management activities, including report to ARA.	ARA (Albanian Academy of Sciences)	– number of participants to events, number of subscribers to publications, web-page traffic, etc.	tbc

Nr.	Activity	Description	Responsible institution	Monitoring indicators	Timeframe
3. Strengthening policy-making capacity					
9	establishment of the National Council for Science and Innovation	Creation of a secretariat for NCSI and adoption of government decision creating the council, including a budget allocation for running costs covering the period to 2015.	governmental decision, Office of Deputy Prime Minister	<ul style="list-style-type: none"> – Council established and operational; notably has dedicated secretariat of at least two experts and budget for fulfilling responsibilities – annual report of NCSI presented to government and parliament: ‘The State of Research and Innovation in Albania – annual progress report’ 	2010–2015
10	delivery of a programme of training and technical assistance to Department of Science within MES	The objective of this assistance is to strengthen the capacity of Department of Science to ensure that staff are well prepared and trained to fulfil day-to-day responsibilities in terms of research policy intelligence, policy-making, linkages to other horizontal policy fields and evaluation of research policy. Support through a technical assistance programme will also cover the new staff of the secretariat of the NSCI.	MES / Office of Deputy Prime Minister	<ul style="list-style-type: none"> – technical assistance delivered and quality assessed ex-post by beneficiaries, i.e. staff of the Department of Science, NSCI Secretariat 	2010
4. Creating an appropriate capacity for programme management					
11	creation and operation of Albanian Research Agency (ARA)	Drafting of the full business plan 2010–2015 of ARA based on the ‘Concept Paper’, approval by government and recruitment of management committee.	Office of the Deputy Prime Minister	<ul style="list-style-type: none"> – business plan 2010–15 drafted and adopted by supervisory board – ARA established by government decision – programme funding disbursed – annual work-programmes approved by ARA supervisory board – annual reports approved by ARA supervisory board – positive mid-term evaluation (2013) 	Sept. 09–May 10
		Initial start up phase of ARA involving recruitment and training of staff, design and launch of initial programmes. Start-up phase support by technical assistance project (to be confirmed, EU support to be requested).	ARA		June 10–Dec. 11
		ARA fully operational. Annual process of approval of work-programme by supervisory board and of previous year’s annual report. Independent mid-term evaluation to be scheduled in 2013.	ARA		2012–2015

Nr.	Activity	Description	Responsible institution	Monitoring indicators	Timeframe
5. Improving the legal and institutional framework for research policy-making and research funding					
12	alignment of legal framework for STI with European Union <i>acquis</i> and practice	Review of existing laws concerning science, technology and innovation, including State Aid, researcher mobility, intellectual property rights, etc. The review will be carried out by a team of experts who will report to NCSI. The required revisions to existing laws or regulations or drafting of new legislative proposals will be undertaken by competent ministries or parliamentary committee, with technical assistance from expert team.	governmental decisions, Office of Deputy Prime Minister	<ul style="list-style-type: none"> – technical assistance and legislative drafts delivered on the legislative review – government decisions and/or parliamentary approval of legislative change – report on effective implementation or enforcement of new legal framework by competent ministries or other authorities (2 years after adoption of new legislative framework) 	Sept. 09–Sept. 10
13	improvement of institutional and management procedures of research performing organisations	Review of capacities, procedures and internal regulation influencing researchers activities (internal career and incentive systems) and management of research outputs (IPR) in universities and other research establishments. Technical assistance for development of strategic R&D plans of universities/centres and for alignment of institutional frameworks.	MES, universities and other research institutes	<ul style="list-style-type: none"> – number of research performing organisations supported by technical assistance experts – number of organisations adopting a strategic medium-term R&D plan – effective implementation of changes to institutional rules, career incentives for researchers, IPR management practices, etc. 	on-going
6. Adopting an adequate budgetary framework					
14	mobilisation of international donors in support of STI strategy	Organisation of a donors conference dedicated to implementation of the STI Strategy.	Office of Deputy Prime Minister	<ul style="list-style-type: none"> – commitment of Albanian Government to multi-annual budgetary framework for implementation of STI strategy – funds pledged by donors as co-financing of specific elements of STI strategy 	by Dec. 09
15	integration of Albania into, and funding received via, EU-funded Western Balkans or ERA-NET, etc. type initiatives	Participation of experts from Albanian authorities and agencies in EU-funded networks with a view to securing additional funds for development of STI policy, joint research infrastructure developments, improvement in STI statistics, etc.	MES, ARA	<ul style="list-style-type: none"> – number of participations to networks or projects co-funded by European Commission related to European Research Area and specifically Western Balkans – funds secured for Albanian organisations/experts participating in such projects 	2010–2015

Nr.	Activity	Description	Responsible institution	Monitoring indicators	Timeframe
7. Installing Monitoring and Evaluation Procedures and mechanisms					
16	establishment of baseline of research performance of public research entities	The objective is to set out the baseline for evaluation of research performance within public research institutions including Higher Education Institutions, towards which progress should be measured.	MES (ARA)	– special survey is disseminated among public research entities, responses collected and analysed	Sept. 09–June 10
17	development and implementation of proposed methodology for monitoring and evaluation; technical assistance contract	Technical assistance is required to build the capacity and capability in MES for preparation and monitoring and evaluation of implementation of the national strategy for STI. Albanian Government needs to commit required resources to ensure that Division for Science in the Ministry has full complement of staff.	MES	– monitoring and evaluation methodology developed, presented and accepted – workshop, objective of which is to consult relevant stakeholders on proposed methodology for conducting monitoring and evaluation, is organised and quality assessed by participants	Sept. 09–Dec. 10
18	improvement of STI statistics	Based on results of the initial UNESCO-supported pilot surveys in 2009, the Albanian Statistical office, MES and other concerned ministries will continue to develop the minimum baseline statistics allowing integration of Albania in the main European and international statistical databases for STI. Further support from UNESCO or EU funded projects will be required to implement this activity.	MES, Albanian Statistical Office	– production and publication of principal STI statistics to standards allowing their inclusion into the main international and European statistical databases	2010–2015

