

III. THE SERBIAN ECONOMY – KNOWLEDGE-BASED SUSTAINABILITY

1. Introductory remarks

The current Serbian economy functions on the basis of an economic structure and given natural and financial resources, technology and the human capital, and it is still unfavourable. All of these resources are relatively weak. In part the limitations result from the weak natural, technological and financial basis. Serbia, with a population of 7,397,651 (estimate as of 1 January 2007) and a gross domestic product of about USD 29.5 billion (estimate for 2007) is not a country of significant market or major economic potential at the global or European level.

However, there are strong indications that with the implementation of adequate strategies of economic and other (environmental, technological, social) development it could significantly improve its relatively weak position compared to other reference transition countries, especially those of SE Europe. Such progress in the development of Serbian society, the state and economy should not be short-lived, nor should its consequences be unpredictable. This means that present-day Serbia is in great need of sustainable economic development based on improvement over a group of key economic indicators (increase of GDP, employment, foreign trade, competitiveness and exports, investments and living standards) accompanied by a reduced burden of foreign debt and lasting macroeconomic stability, a better quality of life, and better environmental and general social welfare.

In general terms, sustainable economic development should enable continued long-term economic growth which is not based on the excessive use of natural resources or on unacceptable environmental impact which could threaten sustainability or compromise the economic prospects of future generations. Specifically, this means that the development of the Serbian economy in the direction of sustainability may be seen only through generating economic growth based primarily on knowledge, information, human capital, education and the quality of the links between the people and their institutions.

2. Assumptions

After the year 2000, the fundamental rules applicable in the world of market economy, the rule of law and political democracy were established in Serbia. These rules, however, are still not predominant in real economic, social and political life. Many economic trends related to current excessive consumption, insufficient investment, increasing imports, increasing national and foreign debt, unemployment and the lack of financial discipline, indicate that the necessary pre-requisites of lasting and quality economic growth (and sustainable development) have not yet been achieved.

The behaviour of business entities and citizens on the market, and in the process of economic reforms (before the authorities, judiciary and law-enforcement) is not always in line with the needs of the community. The economic system that was established after the first stage of institutional economic reforms is not sufficiently stable or sustainable. There are worrying signals about the local economic environment in terms of lack of implementation of laws, inadequate respect for property rights and contractual obligations, avoidance of taxes and contributions payments, lack of financial discipline, the absence of social dialogue and the

unfavourable response of the labour force and trade unions to economic reforms, violation of labour regulations, problems regarding bad privatization, mass corruption and the organized economic crime which still exists.

3. What kind of economy does Serbia need?

The issue of the development of the national economy today, at the beginning of the 21st century, has gone far beyond the theoretical considerations prevailing during the second half of the preceding century. Earlier development theories were based on «natural» limitations on growth rates over a long period of time. At the beginning of the 1990s, however, the currently prevailing concept of development – the concept of sustainable development appeared. The concept is based on a new theory of growth, with materialized knowledge and a complex of scientific-technological development at the core of modern development. Instead of the old concept of natural comparative advantages, the modern understanding of development is dominated by used comparative advantages; instead of natural resources as the decisive factor determining the speed of growth and the development of a national economy, the focus is on the speed of innovation and the ability of an economy to translate acquired theoretical knowledge into inventions and new technologies. The old notion of wealth was measured in physical terms and by financial capital (tons of goods produced and millions earned), whereas today the key indicator of national wealth is the ability to generate new knowledge, ideas, innovations and technologies, which is to say to create and utilise human capital.

Accelerated development on the global scale is accompanied by building global alliances and linking whole regions for the purpose of strengthening the position in the global economy and on the financial scene. Those who do not join these processes will certainly be marginalized in the long-term, excluded from the flows of information and knowledge, and with the lapse of time the missed opportunities will become increasingly difficult to make up.

The major features of the world economy at the beginning of the 21st century include:

- The globalization of total movement of goods and financial flows in the world accompanied by concentration of power of decision-making in a few world centres;
- The liberalization of movement of goods and capital globally under the pressure of the most powerful world economies, maintaining at the same time restrictions on the free movement of labour;
- The harmonization, coordination and regionalization of the economic policies of countries as members of different economic-political groups, such as the EU, ASEAN, NAFTA, etc.

Such development of the global economy has been made possible primarily through the materialization of basic inventions from the so-called third technological revolution, which took place predominantly during the last three decades of the 20th century, primarily in the technologically and economically most developed countries and regions of the world. Developments in IT technologies, production and the use of new materials, micro-electronics, robotics, the expansion of bio-technologies, genetic engineering and other most propulsive sectors of the economy, have resulted in unprecedented possibilities for networking and building links between the movements of goods and especially capital, which, until recently, were unimaginable. Instead of natural resources, arable land, mineral resources and available capital, the dominant

development resources of a modern economy, practically all over the world, are applied knowledge, education and science.

Serbia today cannot choose whether it wants to join the world of globalized economies and new technologies and continue with the initiated market and political reforms. Serbia has already decided that it is dedicated to EU membership, with all the economic-legal, political, administrative and environmental implications of such a choice.

Serbia, however, can and should choose, and carefully set the strategic coordinates of its economic, technological, and social-cultural development, adjusted to the currently prevailing situation and to the needs of future generations. Since global changes in the structure of factors of production indicate an increasing dominance and superiority of the so-called non-material factors of economic growth, such as knowledge, information, organization, culture, education, the legal system, Serbia has no other choice but to accept the strategy of relying on the development of human capital. It is this that, in the experience of the economically-technologically most developed countries, brings the greatest yield of added value by unit of labour and capital input invested.

Therefore the choice of Serbia today is to opt for a knowledge-based economy which will dominate its economic activity in the near future. Serbia needs a broad use of knowledge in all aspects of life. This knowledge should come primarily from the market economy, meaning financing from private funds and especially from the competitive service sector, but it also needs incentives from the state.

Knowledge can contribute to the development of the economy and society in Serbia based on the progress made in communications, better system information and development of e-government. That is the kind of economy that Serbia can envisage and implement as its strategic goal, by identifying the following areas and directions of change in order to achieve sustainable development of the society:

- A knowledge-based economy, as the dominant quality of the strategic development process;
- The structure and quality of a sustainable economy and economic system;
- The manner of achieving and finalizing sustainable economic reforms;
- An adequate macro-economic environment and the choice of economic policy;
- The system of sustainable production and consumption;
- Improvement of the system of education;
- Development and enhancement of IC technologies;
- Sustainable scientific-technological policy and system;
- Protection and enhancement of intellectual property.

4. A knowledge-based economy – how and why?

The terms “knowledge-based economy” and “knowledge society” have become recognized and very popular globally. Not only in theory, but within most relevant international organizations, numerous studies have been implemented confirming the significance of these concepts. There is practically not a single economically developed country in the world today which does not have a specific policy or strategy to promote the knowledge-based economy.

After mentioning the significance of the knowledge-based economy several times, in the “Lisbon Strategy” in 2000, the EU made projections that the Union, “by the year 2010 should become the most competitive and the most dynamic knowledge-

based economy in the world, capable of sustainable economic growth and new employment and better paid employment”. At the same time, the EU designed about 50 specific measures and policies whose implementation would lead to the achievement of the said target.

The economic history of most known civilizations was based first of all on the concept of the agrarian society in which the role of natural factors and physical labour was dominant. During the expansion of industrial societies, whether dominated by processing or trading activity, the dominant factor of production was real and financial capital (money, industrial plant, energy). Technological development resulted in the declining role of physical labour, material technology, and natural and financial resources. During the 20th century this gave birth to the concept of the “post-industrial society”, the “information society” or the so-called “weightless economy” dominated by non-material factors. In a society with a knowledge-based economy, in which knowledge is the dominant anchor and the dominant comparative advantage, the main factor of production moves to a complex of non-material factors (such as information, knowledge, skills, labour culture) generating increasing economic yields and increasing market value.

The evolution in the structure and use of production factors based on technological changes has led to changes in the type of dominant economic activities: from agriculture, industry, services and the third sector of the economy – the services sector, which became the key sector both in terms of employment and in terms of income generation.

The expansion of the service sector brings about major changes in the generation, collection, creation, processing and use of information. Since mass supply and increasing availability of services based on information lead to a rapid drop in their price with time, this opens up possibilities for their use by a practically unlimited number of users around the world. Namely, agriculture and industry in the modern world depend increasingly on research, use of information and knowledge in product development, and commodity and financial markets.

The move of structures of economic activity from that dominated by the primary sector, made up mostly of agriculture and extraction industries, over the secondary sector (dominated by the processing industry) towards the tertiary sector (dominated by services) brings about increased production, employment and standards of living, or welfare. Due to the increase of productivity in industry and agriculture, caused by technological progress and increased quality of human capital, the greatest employment in a knowledge-based economy is exactly in the tertiary sector. In this, it is important to note that the tertiary sector is more productive than other sectors, especially since it makes more effective use of information and knowledge. On the other hand, a strong tertiary sector enhances productivity in agriculture and industry, in which employment decreases so that they become more profitable and competitive.

Since market valuation is the decisive factor of economic performance, there is a huge increase in the number of agencies collecting, analyzing and selling certain information pertinent to the market. Thanks to such information, and impact of new technologies and knowledge, there are organizational and institutional changes in the form, size, structure and functioning of companies. As a result of this process, the companies of the tertiary sector are mostly small and flexible, often interconnected only electronically, with better qualified staff, better connected in the research and development sector.

The increase in the number of economic entities, thanks to the expansion of the tertiary sector and the impact of information and knowledge, is accompanied by the increasing general level of competition in economy and society.

A knowledge based society and knowledge based economy, however, do not imply rigid, fact-based, theoretical or textbook knowledge, but rather a set of skills, competences and interests which help create innovations, solve problems, cooperate with others and act towards the general welfare. In this respect, there are different forms of knowledge, which answer not only the questions “what” or “who” but also “why” and “how”. Knowledge, actually, can be more or less economically efficient, depending on the relation between knowledge seen as public knowledge and knowledge which is private.

What is important in this, from the economic point of view, are the following:

- It is good for the society and economy that knowledge as a public resource be used broadly and easily in the interest of general progress, and to be more broadly and easily accessible to all potential users;
- Knowledge as a private resource should be efficiently protected as intellectual property in order to achieve its advantage on the market and generate profit for its owner.

The use of knowledge is conditional on adequate payment for its use. Without this, investors would have no reason to invest in generating new knowledge and inventions.

To make efficient economic use of knowledge requires subjective and organizational capacities of the user (individual or company) and an adequate institutional environment, such as laws and their implementation, state institutions and associations. The quality of this environment is decisive in how efficient the use of these resources will be at national and regional level.

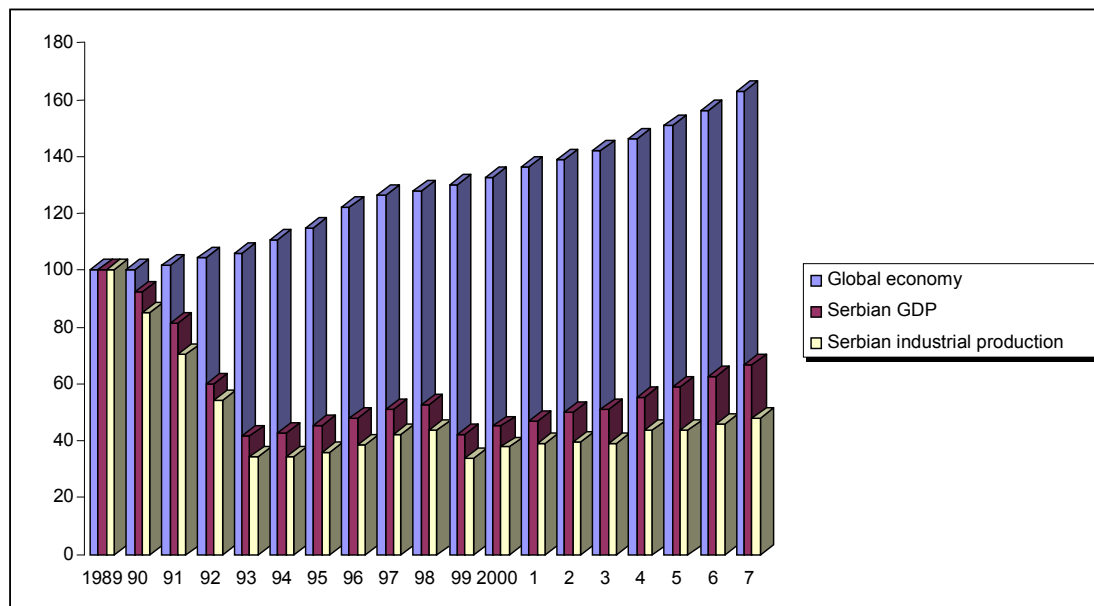
To make use of the advantages of the concept of a knowledge-based economy at the national level, it is not sufficient simply to improve the position of the new production areas on the market then await the spontaneous restructuring of the economy in the direction of the greater domination of the sectors with greatest share of knowledge. To achieve this concept, based on the experiences of the most highly developed world economies, the following are the most significant factors:

- Modern education and continued learning;
- Funds for research and development, especially investments in modern industries (computers, bio-technologies, pharmacology, etc.);
- Adequate scientific-technological and cultural national policy;
- Adequate management of economic changes in line with the changes in the world and the direct neighbourhood;
- Selection of a macroeconomic policy, system and structural economic solutions;
- Telecommunications, massive use of computers and other modern technical devices;
- sectors of high technologies and identification of incentive measures to attract foreign investments in these sectors;
- Protection of property rights and especially intellectual property rights;
- Social corporate responsibility.

Special attention will be paid to each of these factors and pre-requisites of a knowledge-based economy in the following chapters of this Strategy.

5. The economy of the Republic of Serbia– development and sustainability

The economic development of Serbia during the last decade of the preceding century was strongly influenced by non-economic factors, devastating hyper-inflation, and a *de facto* war economy. This further aggravated the otherwise weak position of the country in the international setting. There were major disturbances in the structure of generating and appropriating the gross domestic product (GDP), with increased domination of the primary sector, neglect and devastation of industry and stagnation in the service sector. A significant portion of economic activity moved into the “grey zone”. The period from 2001-2006 saw an accelerated recovery of the economy and achievement of relatively high GDP growth rates, accompanied, however, with slower changes in structure and appropriation than expected after the democratic changes in the country. This points to the need to identify different development strategies for Serbia in the forthcoming period which would be oriented towards the country joining the countries which generate their development primarily through knowledge, science, innovation and modern technologies.



Source: The Republic Statistical Office, 2007.

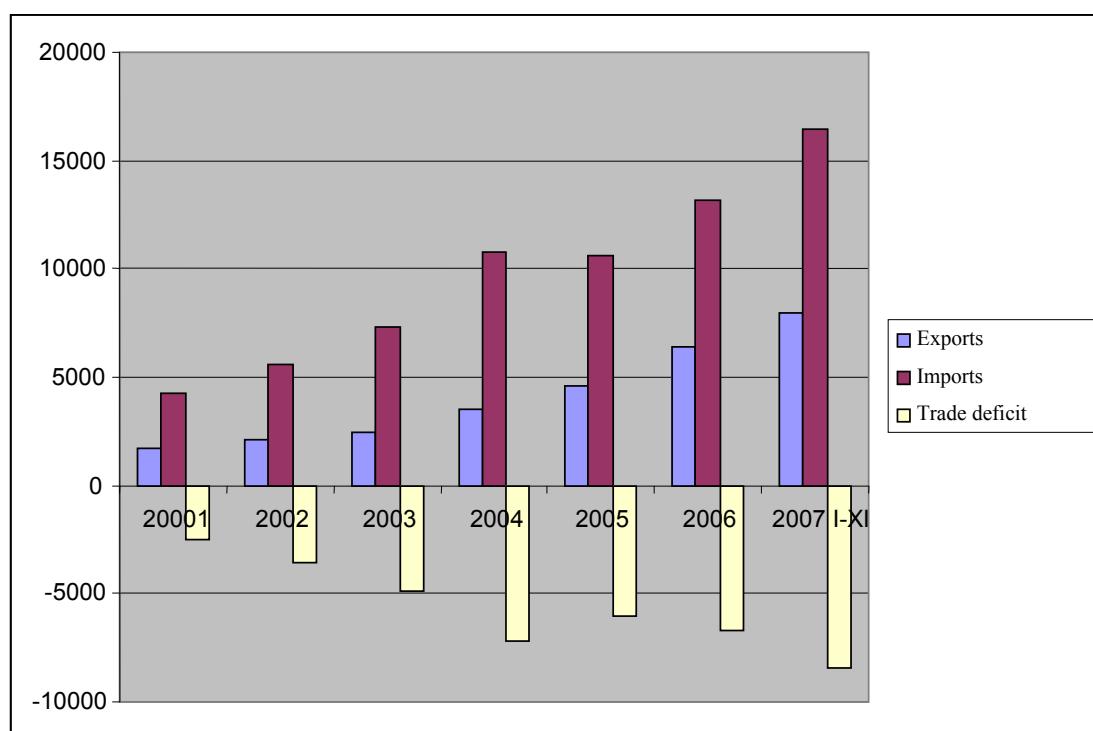
Figure 3. Unsustainable macroeconomic trends in the Republic of Serbia – comparison to the global situation 1989-2007

Despite improvements compared to previous practice, there are still trends towards the domination of personal and collective consumption in the manner in which the GDP has been used since 2001, and insufficient investment in the needs of the society. This has led to an inadequate distribution of GDP and is slowing down economic growth and technological development, and limiting the share of investments in the appropriation of GDP. Although the official data regarding the share of investments in GDP is not sufficiently reliable (primarily due to incomplete recording of changes in the private sector), it is estimated to range between 16% and 18%. At the current level of development of Serbia and in order to maintain long-term high growth rates and implement the needed structural reforms, it is necessary to increase the GDP share of investments to 22-25%.

At the same time, national reserves are sufficient only for a smaller share of investments and the major part is covered through foreign accumulation through foreign loans. This means an additional burden to future generations in Serbia to pay back foreign loans and the interest accruing on them.

The balance of exports to imports remains constantly in major deficit, and is only covered by uncertain and temporary sources (foreign transfers and the proceeds of privatization), or through additional foreign loans, which constitutes a burden in terms of future economic activities. Unless there is a significant increase in *greenfield* foreign investments, the Serbian economy will remain under threat of a crisis of foreign liquidity.

An additional problem in the current stage of economic development of Serbia is the insufficient integration of the national economy in the economic-financial movements of the European and world economy. The necessary GDP share of imports and exports at the present level of the economy should be at least 50% on both the export and the import side. Together these factors have resulted in serious technological obsolescence in domestic companies, and low productivity which make Serbian products less competitive, especially on foreign markets.



Source: The Republic Statistical Office, 2007.

Figure 4. Unsustainable macroeconomic trends — insufficient exports and constant trade deficit 2001-2007

Additionally, the rate of investments in research and development, and also in education, is very low, and insufficient to meet national needs, low even in respect to the GDP share of these investments undertaken as obligations under adopted development documents.

The building of an open market economy integrated into its environment is stated as the goal of all reforms undertaken in Serbia since the democratic changes in the country in 2000. Although the goals of sustainable development are to a high

degree compatible with the open market economy, the experiences of other countries that have undergone transition indicate that there are also certain “faults” (dis-functionalities) in market mechanisms that have to be removed through the active involvement of a modern state. Judging by the modern development strategies implemented internationally, the role of the state is measured not simply by the scope of state intervention, but rather by the structure and quality of the way in which the state performs the functions required by the modern development process.

In order to identify accurately the place and the role of a modern state in development processes, it is necessary to analyze whether the state performs its basic functions in terms of: macroeconomic stability, remedying market failures, redistribution of income, removing great regional disparities, and facilitating the attempt to catch up with modern economies.

Catching up with modern market economies is more difficult in the present day world than it was in the past. However, at least in theory, it is believed that it is possible thanks to the following circumstances:

- The IT revolution has made knowledge available at a much lower price than in the past;
- Structural changes that have happened over the past twenty years have resulted in the fact that physical capital is a less significant factor of economic development, especially for the most developed production sectors (based on knowledge);
- The concept of economies of scale now is far less significant than before the IT revolution.

In such a new system of values the roles of the state are as follows:

1. achieving a dynamic economy based on knowledge and educated individuals, with equal opportunities for success, an economy in which the state does issue orders, but facilitates and promotes, and in which the market is the moving force serving both the private and the public sector;

2. development of the system of social corporate responsibility of the business sector, companies and institutions, primarily through promotion of socially responsible business activity, both in terms of environmental protection and in terms of humanizing labour and building a labour culture;

3. promoting the development of civil society in which the state acts as a partner to voluntary associations and citizens organizations;

4. building a modern public administration based on cooperation, decentralization, human rights and especially equal opportunities for all.

With this in mind, Serbia must follow the following fundamental principles of sustainable development based on a knowledge-based economy:

- A substantive transformation of the national economy in the direction of strengthening the place and role of the most successful sectors, meaning the dominant sector of services and industry based on the innovative activities of entrepreneurs;
- Ensuring a high DGP share of investments, primarily on the basis of increased national savings, as a function of the complete restructuring of the economy;
- Building a modern and efficient education system that will be the pillar of a future efficient and competitive knowledge-based economy;

- Implement the Program of promoting innovative and entrepreneurial behaviour and development of an entrepreneurial culture among the general public.

Such objectives for the development of the national economy can be achieved only by integrating the broadest layers of the population in the development process. In this way, a greater number of citizens would participate in decision-making processes ensuring the needed consensus on important development issues.

The Serbian economy, with low income, must identify funds for the said purpose, primarily from the following sources:

- Through mobilizing the unused personal funds of the citizens, including funds from foreign transfers into legal money flows, through programs stimulating investment in knowledge, education and the self-employment of entrepreneurial individuals.
- Through using foreign sources of financing, mostly through joint-ventures with interested partners;
- Through re-distribution and more efficient use of the existing level of public revenues;

6. Transition and the sustainable development of the Serbian economy

The reforms of the Serbian economy, especially after the year 2001 have resulted in the beginning of the rule of institutions. However, they are still not functional enough. A new Constitution has been adopted, as have dozens of reform laws, the budget has been balanced, VAT has been introduced, and social policy reformed. But, the market economy is still not functioning in Serbia in a sustainable manner, not even at the level of the more advanced countries in transition, since political arbitration is still, to a great extent, the decisive factor for the economic position of enterprises, especially those of the public sector.

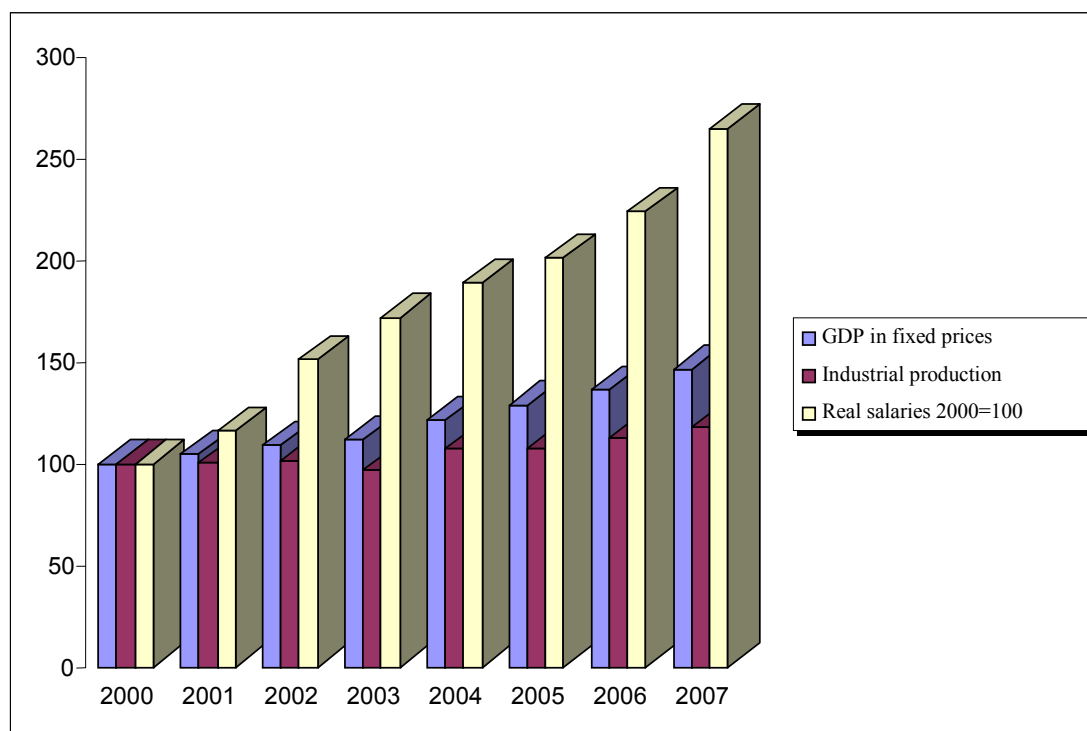
The level of collection of debts is very low, especially in the public and socially-owned sector, and this is not due only to inadequate legislation, but also to inefficient work and lack of capacity of the judiciary, law enforcement and clients. A very fragile macroeconomic stability has been achieved, primarily based on high inflow of foreign transfers and the policy of a “strong” local currency, or restrictive monetary policy, but not on the basis of long-term and sustainable solutions in the economic system, and not on equal opportunity for economic entities and their market behaviour.

The privatization of social property resulted from its un-sustainability and the need to change the structure of the economy. The privatization sale of a portion of national assets in transition has so far been performed to a large extent in order to meet planned high budget expenditures and has created only the illusion of a balanced budget. The major problem is the issue of the sustainability of such a situation, as these are one-shot proceeds that cannot be repeated, and which have been used mainly to cover consumption.

One of the reasons of the insufficient competitiveness of the economy is slow deregulation and the inefficiency of the privatization of socially and state owned capital, and continuing significant economic interventions especially in form of

subsidies for the so-called big enterprises which generate the greatest losses. Another important fact reflecting the problem of insufficient openness and competitiveness is the relatively high monopolization of the national market. Another reason for weak competitiveness is the continued existence of state monopolies, especially among public enterprises at national and local level and enterprises with special and exclusive rights, the building of private monopolies, and strong links between the political and economic spheres of public life. Monopolistic structures in Serbia to a great extent prevent efficient and sustainable implementation of economic transition.

This means that the current reform model is to a great extent insufficient and unsustainable and that fundamental changes in the economic system, legislation and even behaviour are yet to be performed in order for Serbia to gradually build a sustainable knowledge-based economy. The results of the implemented reforms and growth between 2000-2006 as indicated by relevant national analyses and empirical surveys show that what was implemented was a “strategy of frontal attack against all obstacles” to growth which resulted in “confusion in economic policy and lack of a clear growth strategy”.



Source: The Republic Statistical Office, 2007.

Figure 5. Unstable economic growth and very rapid increase of average real salaries 2000-2007

The analysis of “growth diagnosis” after 2000 points to very weak results of “yield to *social capital*”. Namely, surveys indicate a very low level of qualifications among average employed labour and the population, or very low quality of human capital. The most important indicators of insufficient yield on social capital (people, their knowledge, skills and links) are: a tendency to increase salaries beyond the increase of productivity of labour, weak flexibility and territorial mobility of labour, problems with the socialist legacy in establishing and treatment of posts and obligations, the “soft” approach by employers and politicians to the broad social

groups in reforms and to “victims of transition”, or to those who were privileged in the past economic and social model of the society until 2000. Another just as important additional reason for poor yield on social capital is the obsolete infrastructure and inadequately developed telecommunications.

Among the factors that have had a negative impact on the results of transition are many “micro risks“, primarily corruption. According to surveys for the years 2004 and 2005, of the total of 145 countries, Serbia was ranked 97, which is the worst ranking in the region. An improvement in this respect was noted in 2006, when Serbia was ranked 90, and in 2007 Serbia ranked equal with Croatia, which in 2006 was ranked 69.

Property rights are far from being implemented fully, not only in the context of lagging behind and actual effects of privatizations, but especially due to lack of legislation on the restitution of property and lack of solutions for land ownership.

A general overview of such a reality indicates the following problems or risks to sustainability of the present reform processes:

(1) The structure of budget revenues, or the fact that a great part of the budget is based on single proceeds from privatization of existing enterprises.

(2) The proceeds of privatization are near to depletion. Although the privatization process is not yet complete, the more difficult part of the work remains to be done in overly indebted enterprises and enterprises without market prospects, and a portion of the state owned sector with a somewhat greater value.

(3) Public expenditure and the budget balance of Serbia, bearing in mind that public expenditure continually exceeds 45% of GDP and the total public expenditure was 38.4% for 2006 and 37.5% as planned for 2007. It is important to note here that current expenditures for education are only 4.2% of GDP, and for environmental protection only 0.3% of GDP and that this is far below equivalent expenditures for these purposes in other transition countries.

(4) Unsustainable expansion of imports and the increasing trade *deficit*, which can be interpreted as a reflection of the disproportional level of national non-productive consumption, but also of insufficient competitiveness of the Serbian economy.

(5) Insufficient investment, especially from national sources of accumulation. The share of *green-field* investments is negligible compared to investment through privatization of existing companies. Investments from the budget which are appropriated from the proceeds of privatization, through the National Investment Plan, are not a long-term and sustainable solution for the growth and development of the Serbian economy.

(6) Insufficient development of capital markets having in mind that the total market capitalization of the Belgrade Stock Exchange in December 2006 was only EUR 1.2 billion, and its share in GDP is much lower than in more advanced transition countries, including those of SE Europe.

(7) Lack of a legal basis for acquisition of rights (ownership) over building land under market conditions is a major obstacle to improving conditions for investments in Serbia.

All the above risks indicate the need for strategic management of economic reforms. The objectives of sustainable development of the Serbian economy, in the context of finalization of sustainable economic reforms, include:

(1) Economic growth – the right of citizens to a better quality of life.

Irrespective of the past, the current situation and the prospects of the future generations, the fundamental economic starting point of a realistic strategy of sustainable development is: the Serbian economy must and should grow, and the population has the right to use the economic and technological development based on increased production, employment and standards of living. In order to achieve sustainable growth based on a knowledge-based economy, Serbia will, over the coming decades, have to rely much more heavily on the private sector which should generate economic growth of better quality, and quality development effects: technological progress, structural changes, productive employment and stronger competition. This will call into question many privileges and monopolies that resulted from past practice or from linked interests of the private and public sectors during transition.

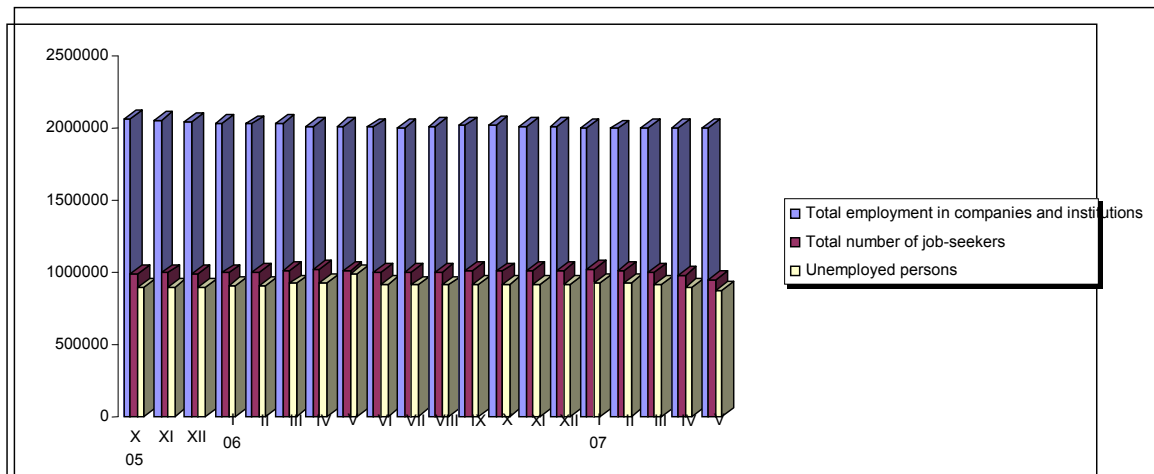
Measures for achieving this goal need to be oriented to promoting national and foreign investments, accelerated privatization and restructuring of the public sector in a consistent and socially responsible manner. This implies:

- The adoption of the law on restitution;
- Monitoring of implementation of measures of financial incentives and institutional enhancement of entrepreneurship;
- Further development of competition based on relevant amendments of legislation in line with EU practice, and based on strengthening the capacities of the relevant regulatory body;
- Promotion of scientific-research activities in the field of entrepreneurship and competition.

(2) Increased employment and reduced unemployment – the ability of citizens to live by their work. People in Serbia have the right to live in an economic system which will enable them easier access to employment and a decent living based on their work, and also based on their entrepreneurship, knowledge, expertise, art and other creative ideas. The fundamental pre-requisite for increased employment and reduced rate of unemployment is the growth of the economy, especially in the services sector, but also based on applied knowledge and new technologies, meaning an economy which is competitive also in an international arena.

To promote employment, the following *measures* are needed:

- A well-designed promotion of development of small and medium enterprises;
- Further relief of the tax burden on the economy;
- Tax and administrative incentives for foreign investments with special incentives for investment by the Serbian Diaspora, not only through simplified procedures, but also through special promotion on the international level;
- Incentive measures for employers to employ the poor and members of vulnerable groups, as measures of active social policy oriented to reducing poverty;
- Further reforms of the labour market and its increased flexibility;
- More efficient protection of labour rights and promotion of social corporate responsibility;
- Gender mainstreaming of the necessary measures in order to enable equal participation of both genders and equal participation of marginalized social groups.



Source: The Republic Statistical Office, 2007.

Figure 6. The number of employed and unemployed in the Republic of Serbia by months, 2005-2007

(3) A stable and reformed economy - a sustainable economic structure.

The citizens of Serbia want to work under stable economic conditions in an economy with a restructured, modern and rational economic structure. Serbia will, in the short-term, have to design a model to finalize privatization of socially-owned assets and a good portion of the state-owned assets. The new Constitution of Serbia, adopted on 9 November 2006, removed the category of social property, yet in a way it still exists in practice. Serbia is faced with the challenge of putting an end to social property by finalizing privatization and the remaining restructuring at all levels in the near future.

Measures needed to achieve this goal imply:

- A consistent implementation of the principle of tight budget restrictions (spend only what is earned), both for the private and for the public sector, as well as for households, as the principle applicable to disposing of public and private assets at all levels of consumption;
- Urgent adoption of a strategy to finalize privatization and reorganize the public sector, in this a highly qualified team of international and national experts together with representatives of trade unions should design a concept for the restructuring of public enterprises;
- Implementation of bankruptcies according to the law;
- Creating the necessary legal framework for the possibility of acquisition (ownership) of building land under market conditions which requires adopting of new and revising the existing regulation;
- Accelerated removal of the remaining price disparities and moving on to economic prices of energy, as well as harmonization with the European electricity market.

(4) Balanced regional development - reducing the influence of the “damnation of territorial origin“. Regional disparities in Serbia are increasing, as a result of market and political, demographic and other factors. The south and the east of Serbia are worst off. All citizens of Serbia, irrespective on their geographical, national, religious, and socio-cultural origin and structure are entitled to live in a Serbia which promotes sustainable development and knowledge-based economy over its entire territory. This requires a separate policy of incentives for the sustainable development of the regions. These incentives should primarily take the form of improving the infrastructure, education, communications and information. Additional training and qualification for the unemployed needs to be organized according to

priorities of the highest rates of real unemployment, which is to say, according to the situation in the formal and the informal (grey) economy. In this respect it is necessary to establish an advisory, in line with the adopted Strategy of Regional Development, which would monitor and promote the balancing of regional development in Serbia.

In order to achieve this goal it is of the utmost importance to implement the following:

- Analyze the situation concerning development, employment and relative development of Serbia by functional regions;
- Undertake a comparative analysis of regional comparative advantages, renewable and non-renewable resources by regions, assess the possibilities of changing the current economic structure and sustainability of development projects;
- Analyze the relative costs of operations, the status of infrastructure, the market, labour and present the results to foreign investors and potential partners from the Serbian Diaspora;
- Introduce incentives for the regional development of underdeveloped districts by financing sustainable projects based on using relative economic advantages;
- Implement special projects to increase the qualification of labour and adjust it to the needs of the labour market, especially in districts and municipalities with the highest unemployment, for the purpose of productive employment and attraction of younger and qualified labour;
- Introduce incentives relevant to the education and culture of the underdeveloped regions and municipalities in Serbia;
- Promote further development of a decentralized system of support to economic development as a whole, and to integrated rural development, especially in the marginalized and most underdeveloped regions.

(5) Social responsibility, social balance and higher social cohesion. Serbia should make a realistic assessment of its potential, the material, financial, natural and technological resources that it has available, and its potential in terms of the human capital that it may rely on. The future economic development of Serbia must be based on the principles of social justice and the social responsibility of communities for each individual. In transition, when social transfers are drastically reduced, this is not at all easy to do, but the overall social situation could be significantly improved and social cohesion improved to a high degree through better legislation, through mechanisms of consistent and efficient social protection and by going through transition in a socially more equitable manner.

This goal will have to be pursued continually, in parallel with economic reforms and the forthcoming development and social controversies, especially through the following measures:

- Serbia must design the remaining and future reforms in accordance with the potential of the economy and the population to absorb the those made redundant;
- The unemployed will partly receive institutional financial support and temporary subsistence from the employed;
- Another portion of such assistance to the unemployed should consist of financing different programs aimed at enabling the unemployed to become employed as quickly as possible;

- Social responsibility in a society undergoing transition implies a consistent control of minimum wages, or in the targeted measurement and control of household income;
- Special attention is needed to help the “losers of transition” to adjust to the market economy, and in terms of identifying funds for support programs;
- Building partnerships between the public and private sectors through horizontal and vertical networking of all actors of economic development in order that they all share responsibility for sustainable development;
- Analyzing the labour market in terms of gender equality, and the promoting employment of women, or men.

For the purpose of achieving the goal of a socially responsible economy, Serbia must improve its overall economic environment and provide better opportunities for the unemployed, the poor and the socially vulnerable categories of population, especially those who are really willing to work so that they have an opportunity to fulfil their capabilities.

(6) Living in a society and economy with lower risks at macro and micro levels. Citizens of Serbia and the Serbian economy are entitled and should live in a country in which the overall risks are lower and the opportunities for economic, technological and cultural development are greater. In this respect it is necessary for Serbia to approach economic development without any ideological prejudices, developing a market economy and a society of equal opportunities, for the purpose of establishing a stable order and prospective economy. To achieve this, Serbia should build a social consensus for further reforms. In a system with more acceptable and sustainable macro and micro risks it is necessary to provide a lasting development orientation towards international and European economic and technological cooperation, especially for the purpose of EU integration. Of special importance is a higher level of political stability, faster and more efficient reduction of crime and corruption, and a better functioning legal system.

To achieve this, the following measures will be needed:

- Increased government efforts to reduce crime by qualifying and modernizing the police, the judiciary, citizens and the economy;
- Technological improvement of the state of security and control of social balance;
- Amendments in the criminal code, especially in the part relevant to corporate crime and efficient implementation of the code;
- In further privatization, especially of the public sector, it is necessary to amend legislation and ensure that sold capital funds be made available to compensate former owners whose property was seized on different bases (except for criminal acts);
- Strengthen social dialogue in legislation and in practice, primarily through improving the legislative framework, and through continued cooperation between state authorities, the trade unions, the non-governmental sector, consumer associations and pensioners;
- Develop education and disseminate knowledge on change in the spirit of social and personal tolerance and union in differences;
- Improve public information and education on social conflicts and social pathology, and mechanisms of social cooperation, social dialogue and tolerance.

7. Adequate macroeconomic environment and the choice of economic policy

A successful entry into a new competitive era of economic relations at the global, regional, national and local levels requires a knowledge-based economy. It is very important for Serbia that its economic policy and its business and macroeconomic environment for the ongoing reforms and for future economic development are based on a sound economics and other knowledge.

The macroeconomic performance of a knowledge-based economy is a cumulative stock of benefits, skills and information achieved through their use by the recipients or by all users. Such performance cannot be limited only to the sector of IC technologies. A knowledge-based economy implies the positive and stimulating influence of knowledge on the overall network of economic and development factors and processes, from generation of knowledge, through its transfer to its adequate use.

According to the new theory of economic growth, the knowledge-based economy model differs from the traditional economy in the following:

- Economy is no longer characterized by scarcity, but by abundance because, in contrast to tangible resources which are limited, information and knowledge are used jointly and are enlarged by distribution;
- In the globalized world, knowledge is not under the tyranny of place, but it spreads in an accelerated manner;
- Laws, barriers and taxes in the field of knowledge-based economy are difficult to implement on the national level, because knowledge is attracted to economic locations where the demand is greatest and barriers to its transfer are lowest;
- Products with great performance of materialized knowledge generate exceptional profits as they have added value for users exceeding those in products made with tangible resources;
- Valuation and assessment of knowledge to a great degree depend on context because in different institutional environments and at different levels of development they bring different yields;
- Human capital and competence are the most important basis of the knowledge-based economy.

The implementation of a knowledge-based economy model requires certain structural macroeconomic changes. They are reflected in the following major trends and processes:

- Increased demand for highly qualified labour with a high level of cognitive and social skills, readiness for change, development and introduction of new ideas, and inclined to life long learning;
- Greater reliance on IC technologies enabling new working arrangements (working from home, working with shorter or flexible working hours), increased use and performance of codified knowledge, and reduced costs for dissemination of knowledge;
- Increasing opening to the global economy bringing enormous growth of international trade in goods and services and trading in knowledge, relying increasingly on foreign direct investments;
- Internationalization of production which implies the use of new forms of knowledge in order to control and integrate the operating units of companies;
- Changed structure of production implying a reduced share of the primary and secondary sectors of the economy and an increasing share of the tertiary sector (especially the education sector) as well as sectors with increasing added value;

- Increasing importance of international economic and technological networks, alliances and partnerships among companies and other actors;
- Increasing the role of investment in R & D, innovation and education.
- Serbia will have to accept the rule of institutions which need to provide for the establishment of the macro/economic environment needed for the development of a knowledge-based economy. This means that there will be need for institutions which:
 - Establish and disseminate property rights in the society;
 - Limit the expropriation of someone's income or property; and
 - To the greatest extent provide equal opportunities for the broadest population in the field of employment, social security and human rights.

According to their fundamental functions, the institutions of the knowledge-based economy fall within the following groups:

- Market made institutions which establish and protect property rights without which there is no market;
- Market regulating institutions dealing with regulation, externalities, economies of scale, imperfect information;
- Market stabilizing institutions which reduce economic instability and the effects of financial crises; and
- Market legitimizing institutions which provide social security, health and pension insurance.

Serbia will have to develop and operate all forms of institutions in its macro and international economic environment. A knowledge-based economy in international economic relations is characterized by "compression of time and space". For this reason, Serbia will have at present and in the future to adopt a strategic orientation which implies:

- Searching for a niche which could maximize the potential for economic and political exploitation;
- Timely flexible response to the challenges of technological and economic changes happening in the environment, relying on tangible and non-material resources;
- Broadening, multiplying and compressing the links between society and a knowledge-based economy;
- Deepening the levels of inter-relations and connections among economic and social actors in the development of a knowledge-based economy;
- Compressing space and time in which the space of economic activity becomes global and universal and the response time is much shorter;
- Moving the knowledge-based economy from its local environment and its restructuring.

The prospects of the sustainable development of the macroeconomic environment in Serbia can doubtless be considered through the model of a small open economy which needs to build its position and competitiveness on the international scene by accepting the theoretical principles of macro-economy and the experiences of successful small and efficient knowledge-based economies. These are countries with a population up to 10 million and with a national income of about USD 5,000 per capita, who export at least 50% of their GDP and in which the major resource is knowledge.

The sustainable development of Serbia in the given macroeconomic and global environment is not possible without two strategy components - a gradual approach to

reforms and a process of continued harmonization with global economic and technological changes.

Stability and growth as the most important indicators of the performance of any economy are priorities for Serbia. In this it is important to differentiate between short-term results and long-term welfare, with the major impact of growth, employment, structural adjustments and creation of non-material resources and adequate management of material and non-renewable resources. The starting principles in identifying economic policy should be the following:

- Because it has different effects on different social groups, there is no one superior policy which provides a solution that is better for all individuals relative to an alternative situation;
- Different groups have to withstand risks, especially those linked with losses and gains;
- With respect to the different effects of a knowledge-based economy, the focus of a sustainable macroeconomic policy has to be parliamentary responsibility.

8. Sustainable production and consumption

Since the last three decades of the 20th century the world has been trying in different ways to build a system of sustainable production and consumption patterns. This concept is based on producing maximum added value with minimum use of materials, energy and minimum environmental impacts, in order to leave the best possible opportunities for future generations. The focus at the beginning was on the consequences (resolving the issues related to waste, reducing the effects of harmful emissions, “green“ packaging, recycling of by-products) and later the focus shifted to clean production, saving materials and energy.

The present globally usable concept refers to sustainable production and consumption including environmental, material and energy efficiency at each stage of production of goods and services - starting from design and production, to primary and secondary use and recycling and disposal. The cycle is known as the product life cycle, and it is an approach central to designers, engineers and technologists, but also economists, lawyers and cultural workers. At each moment of the life cycle of a product, its producers, distributors and consumers must be aware of all its environmental, social-cultural and other impacts and be responsible for them. A major role in this process in terms of its sustainability is the transparency of the product's environmental characteristics and its manner of consumption, as well as broad public participation.

The situation in Serbia with respect to sustainable production and consumption is very unfavourable. The goods and services on the Serbian market are produced and used in a manner generating excessive and hazardous waste (unregulated landfills and big suburban waste disposal sites). Energy efficiency is very low, although the country as a whole has an energy deficit, so it could be said that energy in Serbia is wasted, due partly to economic and technological factors. The material intensity of production is high, since products and services made in Serbia have excessive material inputs, while the scope of recycling is negligible. This has negative impacts in terms of depletion of resources and costs related to waste management.

There is an urgent need for Serbia to undertake very severe measures to restrict “dirty“ production and to limit the wastage of energy and materials in production and consumption, especially with respect to non-renewable resources. Some of these

measures are multi-faceted, such as a full, cost-recovery price of electricity with internalization of environmental and natural costs. Others refer to curbing the increase of PET (*polyethylene terephthalate*) packaging and reducing and phasing out PE (*polyethylene*) and non-degradable PVC (*polyvinyl chloride*) packaging, as well as leaded fuel and other environmentally unacceptable fuels. In parallel with these, there is a need for state imposed tax and other incentive measures for “green packaging“, biodegradable materials, reduction and separation of waste, increasing energy and environmental efficiency of production and energy saving programs, all of which should primarily be designed as stimulating (and when necessary also restrictive) measures, producer and consumer oriented. This systematically implies:

- Economic interventions – paying the full cost recovery prices for energy (including externalities), and also for natural, especially non-renewable, resources, goods and services, primarily through changes in the legislation, according to the “polluter pays” and “user pays” principle;
- Stimulating measures – promoting production, maximizing the use of “green“ and environmentally friendly (recyclable) materials and renewable energy;
- Adoption of relevant legislation regulating environmentally unacceptable production and consumption and import and export of environmentally unfit products and services;
- A broad campaign of education and raising of awareness regarding sustainable production and consumption;
- Standardization of products and services which are environmentally acceptable and other forms of consumer protection;
- A broad media campaign for sustainable production and consumption;
- Demonstration of healthy life styles and systems of sustainable production by using more efficient, cost-effective and cleaner transport (public transport and bicycling instead of private automobiles);
- Promoting acceptable consumption patterns in consuming energy, water, food, protection of nature and preservation of bio-diversity, cultural and other lasting values;
- Adequate consumer protection and participation in identifying measures and activities aimed at implementing the concept of sustainable production and consumption.

9. Education for sustainable development

Knowledge, which is the basis of the economy and society, is generated by people who, through their education, are rendered capable of creative and critical thinking, resolving problems and cooperating and who will be capable of creating a new economy, a stable social system and sustainable development. A new economic system and a modern structure of economic factors require educated people who learn fast, who are innovative and creative, and adjust their capacities in line with technological progress and global development trends.

Such high demands require fundamental reforms in education which, in terms of standards, lag behind those of Europe and also require a response to the immediate needs of the current Serbian economy.

The education policy of Serbia is not sufficiently focused on creating human resources, and it does not reflect the objectives of the Lisbon Strategy set for 2010 in education and training: greater quality and effectiveness, access for all, open to the wider world. The education system in Serbia is not sufficiently supported in terms of

financing. Expenditures for education in Serbia in the year 2006 were 4.2% of GDP, while the recommendation in OECD countries is 6-8%.

The educational structure of the population is very unfavourable, as more than one fifth of the total population over the age of 15 does not have full primary education, and almost one half of the total population does not have a (formal school) qualification.

There is much to be desired in what the current educational system in Serbia currently has to offer. A significant share of the population still remains outside the educational system, which refers especially to a high share of children from socially vulnerable groups and to the rural population, where there is a strong need for adult education. The advantages of early education are not used sufficiently (the system of pre-school education is not sufficiently developed), primary education does not equip the pupils with the intellectual skills needed for self-regulated learning, critical thinking and problem solving, the education does not rely sufficiently on modern knowledge of the nature of learning and does not stimulate the relevant thinking activities of pupils, nor does it foster research and innovation. Thus, the results of primary education in Serbia, measured in the 2006 PISA (*Programme for International Student Assessment*) research through linguistic, mathematical and scientific literacy, are far below the European average.

The ratio between general and vocational education in secondary schools is very unfavourable to the detriment of general education, and it is therefore necessary to increase the share of general education from 26% to at least 40%. There is also an enormous and unsustainable number of failed grades in secondary school, even in primary schools in Serbia. Many unsuccessful secondary school pupils end up on the labour market as non-qualified workers. One out of 13 generations of young people (on average) leaves the education system without a qualification.

The system of higher education in Serbia has a relatively high number of young people who embark on university study. However, a very low and insufficient number of them (8-10% of the total number of enrolled students) complete their studies in the time that may be considered useful or acceptable for the society. The number of students repeating the first year of studies is almost 30%.

In total, the education system is unsustainable, lacks efficiency, does not include all children and young people and does not yield quality results at any level. As a consequence, the general level of education is low, there is a high percentage of student drop-outs at all levels of education, a substantial drain of qualified professionals to other countries, lack of standards for ensuring quality, a rigid and obsolete programme, lack of the complex and modern skills needed in the education process both among teachers and pupils/students.

In that sense, this strategy when speaking of education for sustainable development means not only the incorporation of contents on sustainable development in the formal system of education, but also such a (new) system of education which supports a knowledge-based economy and is a necessary pre-requisite for sustainable development of the economy and society as a whole.

More strictly, education on sustainable development is a pre-condition and an important tool for good governance, decision-making and promotion of democracy, strengthening the capacity of individuals, groups, communities, organizations and states in their deliberations and when making choices in favour of sustainable development. That is why education for sustainable development implies the

integration of knowledge from all relevant sectors (environment, economy, society) with special emphasis on the application of such knowledge for the purpose of providing higher quality of life for all citizens. It needs to strengthen basic and applied knowledge as a pre-requisite of flexibility in the labour market, to ensure that quality education is accessible to all, to strengthen early education and develop a system of permanent education for environmental protection, and to provide broad competences of educated people in line with changes in technology and changes in the economic environment. Education needs to integrate knowledge and the manner of finding best techniques and methods in all spheres of human life, provide conditions needed to implement the concept of inter-disciplinary education for sustainable development, and to be fully participatory and provide for a greater inclusion of all civil sectors. It must therefore enable the participation and enhanced cooperation of all stakeholders (schools, business, decision-makers, civil society, etc.), and intensive strengthening of international cooperation with relevant scientific-educational institutions.

In order to establish a sustainable system and method of education for the 21st century, Serbia has, while keeping under control the rational use of public funds and implementing a reform of the manner of using public funds, to increase its investment in education to at least 6% of its GDP, to increase the level of general literacy of the population, reduce the number of citizens without a qualification, and to harmonize its educational system to the needs of the labour market and reforms on the one side and the needs of future generations based on new technologies and communications on the other, and improve the efficiency of the system of education.

Concrete objectives include changes in the manner of financing, equal status of public and private systems of education, modernization of programs and curricula, introducing a quality assurance system, creating modern staff who will contribute to developing education, building a social partnership for education, and implement licensing, certification and accreditation.

In view of the above, this Strategy proposes sustainable education in Serbia which will be:

- Competitive in line with the scientific, economic and technological potential of the country;
- Accessible to all, especially to children and members of socially vulnerable groups;
- Flexible and adjusted to the needs of the labour market;
- Attractive enough and in line with the social-economic changes;
- Integrated into the European system of education;
- Financed in a modern manner, based on the model of European system of financing;
- Based on modern management, certification, licensing and accreditation.

In order to achieve the pre-requisites for a new system of sustainable education, the existing system of education needs urgently to be improved. To that end, it is necessary to motivate and support all stakeholders to contribute to the development of education for sustainable development and to integrate contents concerning sustainable development in the formal education system, through all relevant subjects and courses, as well as through informal types of education.

Objectives and direct measures that should contribute to achieving the main goal of the system of sustainable education include:

- Providing more favourable general conditions for economic-financial, institutional and technical support to the process of reform of the system of education and education for sustainable development;
- Promoting the concept and practice of sustainable development and the system of sustainable education through formal and informal ways of learning;
- Providing adequate training on sustainable development for teachers at all levels of education;
- Work systematically to develop research in the field of sustainable development and education for sustainable development;
- Implementing the reform of education by continually promoting cooperation at the national, regional and international level.

10. IC technologies and knowledge-based economy

A special challenge in developing a knowledge-based economy is in creating conditions in which the contemporary IC technologies make it possible to acquire, create, disseminate and use information and knowledge. For ICT to enable the acquisition, creation, dissemination and use of knowledge for the needs of the national knowledge-based economy, ICT has to be perceived primarily as infrastructure for development of information and knowledge which enables the identification and acquisition of new comparative advantages. It is necessary that the national business practices innovative and adopt adaptive operations.

ICT should not be perceived only as a tool (an instrument for automation and technological modernization of operations, increasing productivity, simplified and cheaper archiving of data, quicker processing and transfer of data) as such tools may bring certain progress in operations, but not development. A necessary pre-requisite for the development effects of ICT to be felt is that it is perceived as an infrastructure for development of information and knowledge which should enable the national knowledge-based economy as a part of the global economy. In this respect, it is necessary to harmonize the Serbian Strategy of IT Society with the experiences and institutional solutions practiced in EU countries.

Sustainable development and a knowledge-based economy require a strong role of IC technologies. However, the technologies in themselves are only infrastructure for the knowledge-based economy. Data does not mean knowledge as such. It is important how data is retrieved, created and used.

The government and the relevant ministries must initiate the building of the necessary national infrastructure to support the dissemination of and strengthen the role of ICT in the future development of Serbia. This refers primarily to building a broadband network as a necessary pre-requisite for strengthening the role of ICT in everyday life and work. In order to efficiently promote the role of ICT it is necessary to adopt and complete the institutional infrastructure in this field, fully compliant with EU regulations.

In considering the role of ICT in the future economic development of Serbia, special attention will be paid to the system of education and preparing younger generations for broad and creative use of ICT, so that they can be competitive in the international market of knowledge and information.

In order to establish a knowledge-based economy as the general goal of sustainable development it is necessary to identify a list of strategic information systems to be developed in Serbia, to define clearly the link between strategic

information systems with other elements and processes of the information society, for instance e-government.

The development of ICT in Serbia should improve the efficiency of economic activities and the competitiveness of the national economy by improving the exchange and accessibility of information, and especially electronic commerce, and economic-technological communication in general.

The level of IC literacy in Serbia is still insufficient, even in case of university or secondary education. Data indicates that ICT and the Internet are used in Serbia at a low level and with low efficiency; to many citizens of Serbia ICT and the Internet are not accessible and, when they are, the use is mostly passive and not creative use of ICT. In order to promote ICT, it necessary:

- To identify a list of strategic information systems to be developed;
- To clearly define the link between strategic information systems and other elements and processes in the information society, for instance e-government.
- To increase ICT literacy within the development of key competences and in this context to promote creative and systemic thinking, and to promote the concept of life-long learning in the field of ICT;
- To increase the efficiency and effectiveness of IT education;
- To provide a systemic approach to the use of public data of national practical and theoretical significance.

This process is possible only if a national policy for building a national ICT infrastructure that would be adjusted to the needs of business, citizens and the establishment of e-government is provided. In this respect Serbia needs broad campaigns, such as creative networks “learn to succeed with National Information Infrastructure” and “ICT for sustainable development” etc.

In order to be integrated into the global information system which enables greater efficiency and development of a knowledge-based economy, it is up to Serbia to ensure as the following priority long-term goals:

- An improved level of general IC literacy;
- Consistent implementation of e-government;
- Promote broader use and greater access at work, school and in households;
- Promote broadband providers;
- Local, business, national and global networking;
- Development and research in the field of information systems, e-commerce and ICT in general.

The principal short-term goals and tasks in the field of developing of ICT in Serbia include:

- Establishing an open and competitive market of modern telecommunications;
- Building of a modern telecommunications infrastructure for public administration and local self-government;
- Implementing the Universal service of telecommunications services according to the Law on Telecommunications (“Official Gazette RS” Nr. 44/03);
- Increase the number of Internet users;
- Introducing electronic government and promoting e-commerce in all fields (development of e-commerce, e-education, e-health, e-banking, electronic payments, etc.);
- Promote the development of public services and other contents accessible on the Internet intended for citizens and business;
- Broaden the market for information products and services in an information society;

- Develop legislation regulating all business and other electronic documents, procedures, processes, and data and their harmonization with EU regulations, and acceptance of internationally harmonized ICT standards;
- Establish an electronic system of public procurements;
- Promote the information society, protection of intellectual property rights and use of licensed software in information systems and on the Internet.

11. Sustainability of scientific-technological policy

The economic and overall development of the Republic of Serbia will have to be based increasingly on organized R&D activities which should enable continued technological development in the form of improving the existing and creating new technologies, but also new products, processes and services. In order to achieve this, Serbia needs to increase its investments in science from the present 0.35% to at least 1% of its GDP, which according to the guidelines of the EU is the minimum GDP share that enables positive effects on economic development. These funds should be invested in both fundamental, applied and development research. However, the pre-condition for this is first to establish systematic and market-based links between science and the economy.

Serbia has inherited a highly centralized, bureaucratic system of financing of scientific-research units, not according to their scientific-research efficiency and results on the market, but according to social and other criteria.

The Serbian economy oriented towards a knowledge-based economy will have to change completely its attitude towards scientific-research and development work. The previous practice of development of mostly fundamental and insufficiently applicable research will have to change in order to establish a different scientific-research and development system. Such a system needs to be based much more on market principles and the needs of contemporary technological changes.

Besides a reformed and enhanced system of R&D, special attention needs too be paid to monitoring and measuring the progress made in building a knowledge-based economy. In doing this, Serbia can rely on the experiences and methodologies applied in OECD countries. KBE indicators can be categorized in *three groups*:

(1) indicators of structural change - the share of knowledge-based production and services in the overall economy, increase of knowledge-based added value, structure and rate of economic growth by technological intensity, imports by technological intensity, export by technological intensity, investment in knowledge (as a % of GDP) and comparison with total investments, increase of IKT intensity, investments in equipment, software and patents, increase of employment by degree of qualification of labour.

(2) indicators of generation of knowledge - implying indicators of human capital: percentages of secondary and higher education (by relevant age groups), share in current additional education and training which is strictly professional, average expenditures for technical training per employee in industries, public expenditures for education (per capita), relative earnings in comparison to level of qualification, and scientific and technological indicators: expenditures on R&D as a share of total expenditures from GDP, growth rate in the number of research staff, the inflow of graduates from scientific and engineering professions relative to the total number of employed, number of scientific publications relative to the total population, rate of application of patents per inhabitant.

(3) indicators of knowledge dissemination - spreading of knowledge networks and organizational changes: share of business in financing research and development, number of national and international technological associations of companies, international associations, purpose of business associations, use of business practice, etc.

In parallel with developing a knowledge-based economy and sustainable development, Serbia will have to significantly reconstruct its research and development system. Such changes should lead to establishing better functional links between research and development units, their rationalization and restructuring into a much greater number of units throughout the economy, and a somewhat smaller number in faculties and state institutions oriented towards fundamental research.

In order to ensure competitiveness and a modern research and development system, Serbia will have to:

- Provide for a technological rationalization of research and development units;
- Provide equal access to public funds for private and public research and development units;
- Improve their international competitiveness and promote international linking and cooperation with prominent international institutes;
- Reduce the brain drain of the best researchers through special programs for the most talented young scholars;
- establish uniform IT systems for all scientific-research institutions and improve the potential for use of ICT;
- Introduce systems of e-government
- Provide special stimulation for research and development in propulsive sectors of the knowledge-based economy;
- Promote knowledge dissemination and exchange of scientific information as a public good (scientific events and international exchange of knowledge),
- Provide (in line with the needs of the Serbian economy) the establishment of scientific-technological parks, incubators and development-innovation centres,
- Establish links with the academic Diaspora, both for the purpose of return of its scientists and in order to increase the mobility of its researchers within the country and abroad.

12. Protection of intellectual property rights and sustainable development

Intellectual property rights are a major pre-requisite of a knowledge-based economy. They constitute a set of legislative acts authorizing someone to acquire subjective rights on the basis of an objective asset, including industrial property and copyright. Countries which have not provided for protection of intellectual property rights cannot count on accession to the EU nor on practical use or productivity of intellectual capital which in modern times represents numerous protected elements such as: literary, artistic and scientific work, interpretations and performances by artists, phonograms and broadcasting programs, inventions in all fields of human activity, factory, trade and service trademarks, as well as registered trade names and trademarks, protection against disloyal competition etc.

The current situation in Serbia regarding the protection of intellectual property rights is very unsatisfactory. Although Serbia has adopted the Law on special rights for efficient protection of intellectual property rights (“Official Gazette RS” Nr. 47/06), its implementation is lagging behind, and the level of qualification and equipment of authorities in charge of its implementation is far from satisfactory. The

major problem is lack of understanding, and lack of theoretical and practical consequences of intellectual property. Among those who violate intellectual property rights there is a dominant perception that stealing or abuse of others' intellectual property rights is not actually stealing, and that ethically it is much more acceptable than violation of conventional property rights.

With respect to protection and valuation of intellectual property, Serbia today has to strive towards achieving three main goals:

- Adequate legislation harmonized with international instruments;
- Efficient mechanisms for implementation of such legislation;
- Continued monitoring of economic, technological and social transformations which may require adjustments and amendments to the existing legislative framework.

In this context, protection of intellectual property should enable: promoting, providing and protecting foreign investments through a predictable, efficient and transparent system of protection of intellectual property rights; enabling national legal entities to achieve legal advantage over the competition through an efficient protection of their intellectual property rights. Additional effects would include market expansion of national business entities without significant financial investment. This would mean attracting additional capital for development and market expansion of national companies which have significant capital in form of intellectual property rights and would increase the total market value of companies.

Key strategic measures that Serbia needs to undertake right away in order to protect intellectual property rights include:

- Adopting a national strategy for the protection of intellectual property rights, establishing a Committee for Intellectual Property within the national parliament, or assigning this competence to one of the already existing parliamentary committees;
- Promoting intellectual property for the purpose of membership in the EU, WTO, European Patent Organization;
- Developing a program of permanent education of staff in public administration in charge of implementing legislation relevant to intellectual property rights;
- Implementing a long-term media plan which would raise awareness among businesses, inventors and the general public about the numerous and long-term benefits to be gained through adequate protection and valuation of intellectual property.