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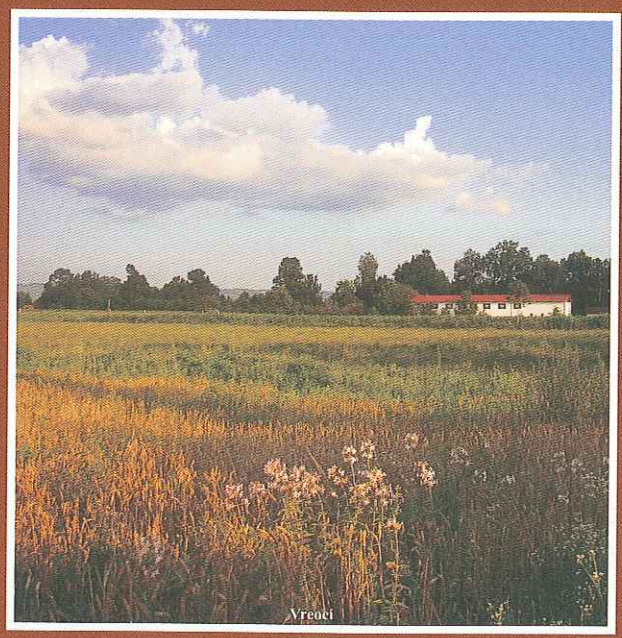

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The review is concerned with a multi-disciplinary approach to regional and urban planning and architecture, as well as with different aspects of land use, including housing, environment, etc. It attempts to contribute to better theoretical understanding of a new spatial development processes and to improve the practice in the field.

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CONTENTS

STRATEGIC FRAMEWORK FOR SUSTAINABLE DEVELOPMENT IN THE PERIOD OF TRANSITION TOWARDS MARKET ECONOMY: CRITICAL OVERVIEW OF THE STRATEGY OF LONG-TERM DEVELOPMENT OF SERBIA

Miroljub Hadžić, Slavka Zeković

This paper offers a critical analysis of the strategic framework for long-term economic development of Serbia, of the role of strategic development in the success of the transition process, and the consequences of the lack of a development strategy. The strategy of long-term economic development of Serbia, as a programme intended to designate the economic and development policy of the state, is analysed with the aim of finding an acceptable formulation of development strategy. The authors consider various approaches and propose a strategy for Serbia in the period of transition towards market economy. They also point out that, in the period of transition from a government-planned towards a market economy, strategy should be given greater importance than in periods that do not represent turning points, because of the greater possibility of incorrect policy making, potential conflicts of interest groups, reaching sustainable development, and maximizing prosperity. The authors take into account the advantages and disadvantages of the radical and of the gradualist approach to transition and propose formulating a development strategy that would contain combined elements of plan and market mechanisms. They believe that the process of transition lacks a clear development strategy, and that the quality of the existing development strategy of Serbia until 2010 is such that it cannot be understood as a serious approach to the transition issue. The authors stress the consequences of undergoing transition without a development strategy, that include inappropriate dynamic and sequence of reforms; a lack of coordination between development policy, macroeconomic policy, market reforms, and spatial planning policy; higher costs of transition, insufficient rate of economic growth, etc. They offer proposals for a comprehensive development framework (CDF) and for strategic planning of territorial industrial development.

Key words: development strategy, transition, strategic planning, sustainable development

INTRODUCTION

Strategic approach to development provides economic subjects with indicators of the economic and development policy of the state in the period of several years. It also provides those who immediately prepare and carry out measures of macroeconomic and development policy with a framework for achieving desired goals. In the process of transition from planned to market economy, strategy gains in importance in comparison with less crucial periods, because the possibility of erroneous policymaking is more prominent, and the conflicts between interest groups more frequent. Strategy allows for a multi-variant approach to development and for a dynamic elaboration of the sequence of moves. Its goal is neutralizing basic conflicts, achieving sustainable development and maximizing prosperity.

The process of transition in Serbian economy is marked by a lack of a clear strategy of development. This is perhaps the most serious limitation of the present phase of the transition process. The consequences of this approach are loss of precious time and energy, huge intensification of existing conflicts, insufficient growth rate, and the danger of dubious end results in respect to transitioning towards a market economy.

The Ministry of Science, Technology and Development of the Republic of Serbia started to create the "Strategy of Economic Development of Serbia until 2010". However, there are two basic reasons why the aforementioned document does not represent

an adequate response to the question: "How is transition to be undertaken?" One of them is that its quality does not allow it to be considered a serious enough approach to this question. The second one is that even the Government, which initiated the drafting of a development strategy, did not find it appropriate to adopt this document as an official bill.

What could be done under such circumstances? The seriousness of negative consequences mentioned earlier is a reason to start making an official strategy, even at the price of being late, since this would at least partially neutralise the negative consequences of up to date activity. One cannot attempt to provide a comprehensive picture of a desirable development strategy in a paper of this length. However, on the basis of a critical analysis of the existing document, it is possible to point out to traps that should be avoided, and, indeed, sketch the basic contents of a development strategy.

THE IMPORTANCE OF A DEVELOPMENT STRATEGY FOR SUCCESSFUL TRANSITION

In the period of transition from a planned towards a market economy, it is important to combine adequately the elements of plan and market mechanisms in shaping economic flows. At present, a large number of highly developed market economies resort to the plan mechanism of directing the economy on various levels of government and to different extent, depending on tradition, the nature of the governing political system, historical experience and other factors (Madžar Lj. and others, 2002). The most important reasons for worse than optimal effects of market mechanisms, and thus, for combining market and plan mechanisms in managing development are considered to be (Filipović M. and others, 2002):

- Natural monopolies, a case in which the market mechanism and the relation between supply and demand do not give optimal solutions, especially regarding production and efficiency of territorial distribution;
- Activities with great external effects, such as infrastructure systems, telecommunications, public transport;
- Environmental protection, as a field in which giving way to market mechanisms does not lead to optimal results, especially due to the increased lack of natural resources, above all water, power and air

In the European Union coordination and matching general and particular interests and politics have recently become important, and member countries, as well as candidates or future candidates for membership in the EU, strive to follow up. In the united market of the European Union, where there are no obstacles to the flows of people, goods and capital, and where the measures of deregulation and anti-monopoly legislation are in effect, macroeconomic and development policies gain a supranational character. This entails a great level of coordination between strategies and ordinances of member countries. According to Vujoševic M., 2002, The Union still represents an 'incomplete entity' of its kind, despite the fact that the recent processes of harmonisation and integration have caused an irreversible trend from a 'confederation of states' towards a 'federation' with a unified legal system. Since our country has the ambition to gain membership in the EU in the near future, the strategy of economic development, together with macroeconomic and development policies, should be envisioned in such a way that its content is coordinated with the requirements that membership in the EU entails.

During the past decade, countries in transition have witnessed a trend of minimizing the plan mechanism that was overly used in the previous period. This was an especially marked tendency during the first years of transition, when the approach of "shock therapy" dominated, and its greatest proponents were the representatives of international financial organisations, primarily the IMF and the World Bank, and among economic theorists Sax G., Lipton D., and Kornai J. At that time, at the beginning of the 90s, they insisted on radical and quick reform. This did not include elaborating particular measures and their sequence, and the general framework for transition was sketched out only roughly: first stabilisation, then privatisation and restructuring. This radical transitional strategy turned, however to be inadequate, especially in the domain of social services. The instructions of international financial organisations gave the most questionable results in Russia and the countries of the former Soviet Union. Key issues of controversy among economic experts (Nellis J., 1999, Stiglitz J. E., 1999) are: the speed and sequence of moves in transition, privatisation and the basic model of privatisation, and the kind and sequence of steps in privatising and restructuring large companies.

The approach known as "market fundamentalism" has recently become outdated, and, according to Vujoševic M., 2002, "in countries where the so-called liberalist discourse dominates among the elites, general anti-plan attitude reaches fascinating dimensions, and even the use of the word 'planning' is avoided because of its ideological connotations and the relation to the GOSPLAN (Russian abbr. for State Plan) model". Economists who advocate a more balanced approach to transition have recently prevailed over those who insist on the exclusive use of market mechanisms (Stiglic J., Gupta, Nelis A.). Regarding the speed and sequence of steps, these economists advocate a step-by-step approach and the importance of establishing market institutions and legislation. As for the basic model of privatisation, they advocate minimising social cost, overcoming conflicts between the most important interest groups, and distributing social cost more evenly with the aim of preserving social consensus (Hadžic M, 2001). Insisting on "shock therapy", radical and quick changes, without a clearly defined strategy of transition and economic development seen from a larger perspective (the basic characteristics of the official approach to transition in Serbia) would thus, at the beginning of the new millennium, best be described as a belated fashion craze, and in terms of content as "market fundamentalism", an approach that is, on the whole, outdated.

Managing complex systems in the economy and the society as a whole is enhanced by an appropriate development strategy, which serves as a basic plan that makes it easier to take adequate steps, define goals and compare achieved results with initial objectives. Measures can be corrected and the sequence of steps can be changed for greater efficiency. Minimising planning (and the formulation of a development strategy immanent to it), or of negating its role and relying exclusively on

market mechanisms of economic management can have grave consequences. They include lower than optimal growth rates and resistance to the 'project' of transition in major social groups. It is unclear when, how, and how much compensation will be received by those social groups that suffered losses at the outset of the transition process. The worst consequence of looking down on planning, in terms of managing economic development, is a possible political downfall of those pioneering the transition process and historical regression.

Formulating a development strategy and using both plan and market elements in managing the economy and its development in the process of transition is important for the following reasons:

- It is a way to overcome conflicts inherent in economic development in the phase of transition, the most prominent ones being those caused by a desire for rapid economic restructuring. This tendency opens up the problems of labour surplus and desire for quick gain shared by all social groups. In this respect a development strategy provides a choice of options that minimise the mentioned conflicts.

- A strategy of transition and economic/social development, if it satisfies the demands of most important social groups and their representatives, helps create and preserve social consensus. Consensus allows for temporarily sacrificing interests of particular interest groups for the sake of achieving development goals. It also helps neutralize union pressure to rapidly increase real wages (in comparison to the growth of the GDP), at the expense of stability and the speed of economic development.

- Official development strategy allows for a multi-variant approach to development. If there is no strategy of transition and development (as it is the case in our country today), then particular ordinances and measures of macroeconomic and development policy are treated as exclusive. This makes room for conflicts between social groups, violating the consensus and political demise of those advocating transition. Strategy formulates alternative directions for achieving goals, on the basis of several development scenarios. This facilitates negotiation on development tracks and particular measures between three parties (the state – employers – unions), and also facilitates correcting development and economic policy "on the go" in case the measures are not giving planned results.

- The implementation of transition steps is easier and of better quality when there is a development strategy. If a plan and a sequence of steps are prepared, it is easier to implement measures of development and economic policy, because they are coordinated. Measures and steps frequently have adverse consequences or they cause effects that appear with a time lag.

- It is easier to assess results and modify policies. It is increasingly important to compare planned with realised effects of policymaking, in order to correct the measures and devices of development and economic policy for achieving better results. (World Bank, 1999)

THE CONSEQUENCES OF NOT HAVING A DEVELOPMENT MODEL

In the last decade our country did not undergo serious transformation regarding a transition towards a market economy. Transition steps started in the early 90s were inconsistent, due to external circumstances and the ill-defined relationship of the government to transition. Thus our economy, which was among the pioneers of transition in the beginning of the 90s, ended up being in the third group of transition economies according to the scope of market reform. It is well known that power balance between the political advocates and adversaries of market reform is key to the success of transition. Due to the consequences of reform measures, which are never neutral, there always are both "winners" and "losers" in every phase of the transition process. The winners are usually newly established small and medium companies, private entrepreneurship, companies formed with direct foreign investments, some social classes. There are two kinds of losers – influential ones and those who are not (according to "Reform Strategy", 2003). The former have at their disposal powerful means to stop reform and turn it into a quasi-reform of inconsistent nature, one that is not sustainable and is far away from a full market economy. Some economists (Galić J., Radovanović M., Fabris N., 1998) even doubt that anything of some significance was achieved during the past decade.

The political changes of October 2002 opened up room for accelerating economic transformation. After years of political crisis, real chances for intensifying development appeared. A condition for that was the return of the country into the international community, particularly into international financial institutions. According to Begović B. (2003), formulating and realising the macroeconomic policy in our country is under the supervision of the IMF, as part of the EFF arrangement, and its conclusions are that "the risks of future macroeconomic policy are relatively small, having in mind that the local financial authorities have demonstrated loyality to full collaboration with the IMF". According to Begović B. (2003), true reform started with democratic changes in 2000, and it was based on the transition experiences of Eastern European countries. The first phase of this reform involved a reform of economic policies. Because of the political crossroads in 2003, marked by a consolidation of the adversaries of the reform, further transition has been brought into question. A much more difficult phase of the reform is ahead – a comprehensive reform of institutions (according to "Reform Strategy", 2003). In the previous period serious steps towards a market transformation of the economy have been taken. They include a liberalisation of export and import, a liberalisation of the domestic market, the Privatisation Act, the Act on Foreign Investments, and changes in tax laws. However, these transition steps are generally sporadic, inadequate, and lack a strategic framework. It is the very lack of a clear development and transition strategy that represents the most important characteristic and the most serious shortcoming of the current economic situation. The Federal Government and the Government of Serbia have not prepared a general, comprehensive strategy of development, with a transition strategy as its most prominent element. Thus the state is involved with reform in a piecemeal manner, without a clear vision of the steps to come. The effects of changes undertaken are unclear, as well.

The roots of this lack of development strategy and coordination in macroeconomic and

development policy lie in the neo-liberal approach, lately outdated, but prevalent in transition economies in the beginning of the 1990s. This approach was imposed as dominant, and any mention of a strategy or a model of development (transition) was seen as unacceptable "blasphemy" against the market, because the market and its laws were simplified and reduced to an anarchic atomised economy, and strategy or a model of development were wrongly identified with planning and planned economy (see Hadžić M., 2001).

The consequences of managing transition without a (clear) strategy of development and a clear sequence of steps are potentially numerous and extremely serious:

• *The reforms may be erratic, because those who are designing and carrying out the implementation of reforms may overlook or be unaware of all moves that should be undertaken.* They may also overlook important, but seemingly less crucial steps that need to be taken, and they may not be aware of the adequate sequence of steps, important for their success. In our country, the reform in the domain of market liberalization and the import and export regime has gone very far, privatisation less so, and the process of reforming the financial system and establishing financial institutions is lagging behind.

• *There can be a lack of coordination between development policy, macroeconomic policy and market reform.* The lack of a development strategy and an elaborated sequence of steps in the process of adaptation to market conditions can easily lead to a lack of coordination and contradiction between individual measures. For example, the radical liberalization of the regime of foreign trade was carried out in this way after the political changes of 2000.

• *Much time can be lost explaining and discussing every significant measure or change of policy*. It takes many people, much time, and great economic resources to prepare and design a comprehensive strategy of economic and social development, but after its contents are coordinated, and the sequence of steps known, there is no further loss of time on discussing reform steps without a general insight into all steps in the reform.

• *When measures are undertaken without a comprehensive and clear strategy, without mutual correspondence and according to a time schedule that is not necessarily clear to the majority of interested parties, consensus of the most prominent social groups can be violated.* At the time when the Privatization Act was passed (2001), there was no official development strategy. Several months of unnecessary discussion showed that a model of privatisation aimed primarily at potential foreign strategic partners can violate the consensus created after the political changes in October 2000.

• *The costs of transition are higher.* A reform that is not accompanied by a clear strategy of development can run into serious social costs that endanger the reform itself. For example, the four largest local banks shouldn't have all been closed at the same time. Although this was justified by a lack of funds to rehabilitate them, it was imprudent because it was simultaneous. A dynamic sequence of moves would have alleviated tensions caused by labour surplus.

• *The end result of transition without a strategy is a lower than optimal rate of the GDP growth*. Without elaborating a comprehensive development concept and the sequence of steps the optimal rates of growth cannot be expected. During the tax reform in 2001, the lack of a global overview of reform moves prevented taking into account the extreme growth of budget income. Consequently, tax rates were not corrected, and the burden imposed on the economy and the population (expressed as the ratio of tax income and public expenditure to the GDP) stayed the same. The end result was not additional growth, but a stifling of the economy under the burden of undiminished duties and greater tax discipline.

• *So-called "transitional recession" can appear in the initial stages of transition, as a consequence of reorganising companies, decreased production and the GDP.* According to the experiences of Eastern European countries, this recession is caused by negative rates of economic growth, that is, by a process in which "healthy" parts and resources from inefficient companies are used in newly founded enterprises. This is the method to provide sustainable economic growth and to achieve increased levels of the GDP in the beginning of transition. New private enterprises become the "generators" of sustainable economic growth. According to Begović B. (2003), transitional recession cannot be avoided, and in Serbia it occurred without transition and before transition, as a consequence of political events during the 1990s, wars, international sanctions, etc. In 200, after political changes, when reform was continued, the level of the overall GDP and the GDP per capita was 40% of its value in 1990. Begović B. (2003) asks whether in the years to follow Serbia is about to experience a true drastic transitional recession and predicts that negative growth rates will not be recorded in Serbia. An answer to this question could be a comprehensive strategy of development and transition.

• *If the errors in macroeconomic and development policy and in implementing reform steps pile up, the end result of reform can be endangered.* If there is a forced, tardy or uncoordinated policy instead of a coherent one, the negative consequences on economic growth can cause social tensions to grow. It may happen that the advocates of reform exit the political scene even before they finish key transition tasks. (This happened in the beginning of 2004.)

A CRITICAL REVIEW OF THE STRATEGY OF LONG-TERM ECONOMIC DEVELOPMENT OF SERBIA

Although the Government of the Republic of Serbia gave the initiative for making the "Strategy of Economic Development of Serbia until 2010", the document prepared by the expert team formed by the Ministry for Science, Technology and Development has never been adopted by the Government as a proposal and it has not been passed on to another institution, such as the Parliament, and it cannot be considered an official development strategy. Therefore, Serbia does not have an official strategy of development or a strategy of transition.

Since the beginning of the 1990s, there has been no legal requirement for producing development (plan) documents. The consequences of the insufficient involvement of experts in creating these development policy documents are apparent in the Strategy Proposal. They boil

down to an inadequate professional level in respect to the technique and technology of document making. In the introduction, the authors describe the methodology used and their typical approach, which economists often call the "engineering approach". This approach is distinguished by an inadequate content, reduced to a list of development requirements in terms of labour and technology, and the investment amounts necessary, which are established in the section on measures and policy. Requirements in terms of labour and investments are formulated for each branch of economy analysed. The document in question is actually author's wish list. These wishes are the desired development goals set by the authors, but they do not reflect a serious approach to development that starts with the constraints and development potentials, that uses measures and policies to achieve development goals, such as particular growth rates and a particular level of development. The overall goal encompassing all development objectives is to quickly catch up with the transition economies in the environment after a decade lost in terms of development. The dynamic of development and other relevant parameters are subordinated to this goal, which is, all in all, far from reality.

The vision and objectives of economic development of Serbia formulated in the "Strategy of Economic Development of Serbia until 2010" give preference to sustainable development of Serbian economy, in the sense of achieving a constantly sustainable growth. This approach to studying complex social, economic and ecological/spatial issues in the period of transition towards a market economy does not have an all-inclusive character. The positions on the role of the market, private property, and foreign investments are not very clear. Thus it remains unclear which development option is the foundation of "The Strategy…" It seems that it was necessary to render market, plan, and mixed versions of the development strategy for the following period. In the potential option of mixed economic strategy there would be a parallel and responsible role for both the state and the companies, especially the newly established small and medium enterprises. There would be a combination between the role of the market and an adequate state protection for the key players in the process of restructuring and privatisation. Yet, such an option is not even sketched out in the "Strategy".

In terms of transition, the model offered corresponds neither to the earlier, nor to the newer model of transition towards market economy. This means that the propositions of the "Strategy of Economic Development of Serbia until 2010" are not based on a neo-liberal approach, typical and dominant at the beginning of the nineties. In the document offered, there is not a single word about a transition towards a market economy "in one step", about a "transitional shock", or a "radical approach" to transition. There is no stress on the speed and the drastic character of reforms, without taking into account the fact that the transition steps and their sequence have not yet been elaborated. There is no stress on the use of the achieved consensus about the need for the transition towards a market economy, and no mention of the wave of enthusiasm for change existing in the major social classes. Having in mind that the approach in the "Strategy" is one sided, exclusively economic, it could be said that it has the indirect features of a neo-liberal strategic attitude. The model of development it offers is not based on the, lately prevailing, gradualist approach to transition. There are three key points characteristic for the gradualist approach to transition. They are: the gradual transition towards a market economy, depending on the speed of establishing appropriate legislation and market institutions; a dominant insider model of privatisation, preferred because it imposes lower social costs and does not jeopardise so severely the consensus of the most important interest groups in the population; and the sequence of steps in privatising large companies, where privatisation is preferred over restructuring the enterprises. The strategy of long-term development offered does not answer to the key questions regarding transition – it does not commit either to the radical or to the gradual approach.

The problems and limitations of the transition period are particularly neglected in the document. It is apparent that the designers of the strategy played down the costs and the resistances that inevitable appear during transition towards a market economy, especially those of social character. This is a reason that such a document cannot answer the challenges that those who create and realise the development and economic policy face. It puts them in an inferior position, with the added danger of a negative end result, brought about by not taking measures to neutralise problems and resistances.

When it comes to industrial development, the so-called "neuralgic points" in the economy have their spatial form:

- The process of privatisation has direct effects on the element of spatial structure, structure of cities and other settlements, the changes in the structure of economic activities, employment, unemployment, social problems, the use of public property and resources, over-development of particular areas, the changes in real-estate prices, etc;

- There is a lack of coordination between economic policies and the policies of urban and spatial development, regional policies, policies of innovation, policies of using construction land, etc. It is well known that the mechanisms and levers of spatial development are beyond the domain of spatial planning.

- The development of small and medium enterprises is left to chance in terms of economic branches and spatial allocation. There are usually no equipped and prepared sites, there are no exact rules of construction, and the road to getting building (construction) permits, approvals, etc. is full of barriers. It is necessary to remove all the barriers and create the institutional conditions for efficient functioning and directing industrial development and allocation. There is no adequate policy of changing the industrial/economic structure (as the vehicle of all reforms in the economy and the society), as well as no policy of spatial development of industry (and small and medium enterprises) on the strategic and local level.

It has not been noted that the basic assumptions and the strategic framework of the future development of Serbia until 2010, in a period of social and economic transition towards a market economy, have consequences in:

- Strategic planning of spatial development of industry (approach, methods, criteria, location factors, location forms and spatial organisation, implementation, etc.)

• The interactive relationship between the process of privatisation, space, and solving property issues (privatisation and its effect upon the transformation key spatial elements – regional and local economic structure, kind and type of activities, employment, the emergence of labour surplus, the change in urban matrix, the importance of construction land and sites, the value of real-estate, etc.)

• The domain of environmental protection – the adherence to principles of sustainable development on the level of an industrial branch and the level of a particular enterprise (eco-efficiency and the use of resources/material inputs, the protection of public property, eliminating/alleviating the negative effects environmental quality etc.)

The "Strategy…" does not assign any importance to spatial elements affecting development, not even on the level of distinguishing between developed and underdeveloped areas, establishing "corridors" and "key points" of development, environmental protection, etc.

What possibly worries most, at a time when a feasibility study for future membership in the European Union is being made, is the fact that the document, despite declarations of support for this project, does not correspond (or corresponds vaguely and sporadically) to the extremely lengthy and detailed requirements that the present and future members of the Union are expected to satisfy. This primarily concerns obligations in the domain of regional economic cooperation as a way for the countries in South-Eastern Europe to become ready for membership. In terms of contents, the issues in question concern the framework for development policy in the domains of energy, environmental protection, infrastructure, spatial development, agriculture, etc. In brief, it is a matter of content appropriate for sustainable development. It is also a matter of the set of macroeconomic policies, which have to adhere to postulates accepted in market economies and in the countries aspiring to join the European Union or are already its members. In this case it is a matter of a large number of standards and norms in policy making. The macroeconomic policies of these countries are characterised by a uniformity of objectives and modalities and a supra-national character they aspire to (Vujošević M., 2002).

One could argue that, in the current stage of transition and development, it would be too early to compare the development and economic policy to the requirements for membership in the European Union. However, on the basis of domestic experience, and primarily on the basis of sluggishness and superficiality characteristic for everything undertaken in the sign of pro-European tendencies, the aforementioned requirements need to be faced now, in order to assure normal functioning in the European environment as soon as possible.

The dominant approach in the Strategy is sector oriented, and there is not attempt to designate or integrate other important segments of development (social, spatial, ecological, etc.) At that, no general method or model of development was used to ground development requirements to support or help argue for particular strategic choices. There are no projections of macro variables, gravitation models, input/output models, methods of cost benefit analysis, scenarios of development, etc. Quantitative requirements are often idealised (for example the ratio of export in the GDP of 45%), sometimes they are unrealistic, even insufficiently researched, or simply without proof. Thus the adequacy of the proposed strategic choice of the sector for achieving development goals can be questioned. The lack of analytic and prognostic approach to transition problems and an analytic and prognostic method to overcome existing structural disorder in the economy is evident. There is an impression that the authors believe in an invisible hand that will lead Serbia into the EU. The lack of ground and arguments for the assumptions, evaluations, and projections lend the entire approach to the strategy a magical quality. It is so speculative that it is highly doubtful that the general and particular goals of economic development it sets forth can be achieved.

The model of developing individual economic sectors is very well elaborated in the Strategy, to the level of particular industrial branches (27 of them) and particular products within a branch. However, there was no room in the model for elaborating on tertiary activities, which should develop extremely quickly in the period of adjusting the local economy and which should become the main pillar of the economic structure and its future development. The model offered would be welcome if it facilitated the mobilisation of competent institutions and social classes relevant for implementing the strategy. Still, a macroeconomic document has to offer a clear and precise general model that particular institutional authorities fit into. The strategy offered here is overly fragmented and lacks a clearly described global macroeconomic model of transition and accelerated development.

Strategy represents guidelines and a framework for those who create and implement macroeconomic and development policies, and who use it based on a correspondence between the projected and the realised. For managers on the micro-level it is an indicator of future policies and the future economic environment.

The authors of the document chose a total of 23 sectors of the economy, and then they elaborated development models for each individual sector. These sectors contribute 70% of the GDP. This reflects a static approach to the development and the establishment of comparative advantages of the national economy, since focus in on sectors contributing 70% of the GDP today instead on those that will contribute that share in 2010. Although the potential development of the global economy in the period covered by the strategy was analysed first, as a frame for the development of the national economy, existing tendencies in the local economy were not taken into consideration. One of the key problems of the local economy is its 'heavy' economic structure, characterised by an overly large industrial segment (40%), and, as part of industry, the production of energy and raw materials. This typical structure of the GDP was formed in the 1970s, and it has persisted from year to year without any greater change. At the same time, developed and rapidly developing economies carried out national readjustments of economic structure in the 1980s and 1990s, and found the pillars of development in tertiary activities (retail, handicrafts, public services, financial services). These activities are will have higher than average growth and will, together with other tertiary activities, have a principal share in future economic structure. An extremely important component of transition – structural modification of the economy and company restructuring – is not mentioned in the text of

the Strategy, and "the necessity of deep and comprehensive reconstruction of the Serbian economy" is stressed instead. This is an additional symptom of the engineering approach that prevails in the Strategy.

The document does not propose founding development on tertiary activities, but instead on high technology and specific services. It promotes "the agricultural complex, fine chemistry, pharmaceutics, information and communication technology, a part of the electronics industry and the service sector (transportation, trade, tourism, special services)" as pillars of future economic development of Serbia. The problem with this approach is the partial (in) acceptability of the proposals and arguments. The emphasis put on the role of the aforementioned sectors is justified by their multiplication, the existence of human resources and the existence of companies that are national leaders in these segments. It is certain that the whole of the agricultural complex cannot be the competitive advantage of the local economy, although some of its segments can. It should be noted that the share of the primary sector in the GDP is high (20%). The whole of the sector of information and communication technology cannot be the competitive advantage, either, but only some of its segments. To emphasize tertiary activities as a possible competitive advantage is contradictory, since in spite of that position some of the most important services are not elaborated in the Strategy. In addition to that, the static approach to developing competitive advantages is repeated – the strategy is based on the current existence of companies that are national leaders in particular activities (i.e. on the already existing capacities), instead of possible courses of future development.

A separate issue described in the "Strategy" is the grey economy and its role in economic development. The authors start from the ungrounded belief in the importance of the grey economy. They claim that "the grey economy contributed around 40% of the real national product of Serbia in 2000". There are studies, including those compiled by the Economic Institute (1996 and 1998), which estimate that the grey economy makes around one third of the GDP. It is only in the years of hyperinflation (1992 and 1993) that the grey economy is estimated to be more than 40% of the GDP. Due to overestimating the grey economy, this scenario differs from what could be called a realistic and optimistic scenario of development. The extent to which grey zone activities have been redirected into legal channels is miscalculated. Simply put, the effects that redirecting the economy from grey into legal channels can have on GDP dynamic have been overestimated. In addition to that, the expectations that the grey economy can be reduced to 20-30% of its present scope are overly ambitious, since the neighbouring countries also have a high share of grey economy in the overall economic activity, even the developed ones, like Italy. These expectations are even less founded if there is no drastic change in the approach to formulating fiscal policy, and public expenditure stays at 50% of the GDP, instead of appropriate 30-40% - the estimated true fiscal capacity of the economy and the population. Instead of taking this route, which would obviously be in contrary to the existing approach of competent authorities, the authors of the Strategy emphasises "low budget deficit" as an objective of fiscal policy. This is the contemporary successful approach of competitive strategies in formulating macroeconomic policies. It could be the right move in some other economy in which the fiscal burden has already been reduced to a level that allows for development, that is, a level that matches the abilities of tax payers to bear the burden. At this level of development it is crucial to decrease public expenditure for at least 5-10% of the GDP. This is demonstrated by the fact that the GDP growth lagged behind the attainable in the years after the political changes in the country and the start of transition processes. The option of seriously reducing tax rates was not used, although the state would have possibly had the approximately same level of public income, due to faster GDP growth and more fiscal rigour. This shows that tax reform has not been undertaken. Best evidence that there was ample room for alleviating the tax burden in 2001 is that, instead of the planned public expenditure deficit of 5-6% of the GDP, the deficit in this year was only 1%.

The paucity of measures that the Strategy proposes, especially those for stimulating the acceleration of development, is astonishing. The authors typically keep the habits from the period of planned economic management, when there were widely accessible financial resources. They write of "allowing wide access to resources with low interest rates for financing industrial and commercial activities". It is as if they advocated opening the old Pandora's box of so-called 'budget financing', typical for all planned economies, including ours, where commercial banks were institutions for distributing money. The banks would supply the economy with necessary funding, which would be devaluated through inflation or some other known way, or would simply be written off.

The tendency towards simplification is especially evident in the chapter with the process, i.e. strategy of transition, structural adjustment and corporate restructuring. The authors claim that the essence of corporate restructuring is privatisation. In this manner, a wide-ranging and multifaceted process is reduced to privatisation, an important, but not its only aspect.

The vision of the future Serbian economy can be summed up as: high standard of living, an attractive environment for investors, employment. The vision of future Serbia is elaborated in eight points that confuse objectives with the economic environment. One of the objectives is exporting around 45% of the GDP, which is nothing new, but it is necessary and can be realised mid-term. The Strategy advocates "purging junk dealership and producing what one can and knows how to do well" and an environment that "provides good opportunities for investment, employment, and development"; it points to the necessity to build an economy that is "attractive to investors and young educated work force". The Strategy promotes an economy that has found its place between technologically highly developed economies and economies that have cheap labour as their competitive advantage.

The goals of the development strategy are determined in a manner similar to the aforementioned vision. Primary goals set in the Strategy are: 1) achieving a highly satisfying international competitiveness, 2) the development of economic structure that could be integrated with the economy of the EU with

least cost and effort, and 3) economic development with an increased role of knowledge. The secondary goals are: 1) employment increase and the increase in using capacities and 2) GDP growth. Our key objection is that, although they are not entirely unacceptable in terms of content, goals formulated in this manner cannot be a factor that would forcefully mobilise the participants in economic development. Instead of all that is mentioned above, the vision could entail: 1) establishing a social welfare and market state, 2) structural adjustment based on above average development of tertiary activities, 3) achieving the level of export of 40-50% of the GDP and 4) reaching a certain level of the standard of living as measured by GDP per capita (for example, 7000 USD).

WHAT CAN BE DONE, OR WHAT TYPE OF A DEVELOPMENT STRATEGY?

The most important result of the discussion led in international financial organisation on the basis of ten years of mixed experience in undergoing transition, and in opposition to the transition strategies of the IMF and the World Bank, is the formulation of a new development paradigm – the comprehensive development framework (CDF). This approach is based on four interconnected principles (World Bank, 1999, and Woferson J.D., 1999):

- Integrated and long-term holistic development strategy or agenda
- Independently developed strategy
- Implementation of strategy through partnership, and
- Focus on development results

It is primarily the representatives of the World Bank who advocate the holistic development strategy, as an alternative to the typical recommendations of the IMF from the beginning of the 1990s, which were extremely neo-liberal and in many characteristics one-dimensional – strictly economic, without any consideration of other important aspects of development. A holistic, comprehensive approach does not entail creating only the strategy of economic development, although this is the skeleton of any development strategy, but also the elaboration of social, cultural, demographic, environmental, spatial, and other objectives and politics. Otherwise, the strategy is reduced to a one-dimensional, or in the best case, multidimensional approach, which is outdated at present, because it intensifies, instead of weakening structural, regional, and other imbalances and conflicts. A comprehensive development strategy entails defining well-balanced and mutually integrated strategies: macroeconomic, structural, social, and infrastructural policies of development. Such a strategy should be based on adequately paced analytic work and should set development goals that are coordinated with global goals of development.

A long-term development strategy relies on a comprehensive and in-depth diagnosis. It determines the key areas of development and its participants, including internal and external players. Although it should be prepared and realised in collaboration with international players, a comprehensive development strategy should be defined and implemented independently. It means teaming up and collaborating with international organisations, but not the dictatorship of these organisations, including international financial institutions. The case of Slovenia shows that this is possible. This country implemented its policy of transition without financial or advisory help, and especially without IMF restrictions. In our case, the level of debt did not allow for entirely independent action, but the dictatorship of international organisations was unnecessary, as well as the obedient attentiveness of local authorities. For example, the propositions of the current Privatisation Act from 2001 were needlessly and unrealistically gauged exclusively for potential international strategic investors, and the measures of liberalising foreign trade were radical and lacked a gradual programme.

The strategy should be built and implemented on the basis of a consensus of the most important social interest groups – the government, employers, unions, etc. The strategy of transition, development, economic, and other policies should be formulated in a partnership between the most important interest groups and should be acceptable to them. It is necessary, especially in respect to the social costs of transition, that the dynamic and the sequence of steps are known in advance. This way particular social groups would know when they will lose, and when they will gain. Otherwise, conflicts can emerge that can jeopardise the very process of transitioning towards a market economy.

The strategy should also identify clashes, bottlenecks, connections, present and potential competitive advantages and synergies. In order to be successful, it must be translated into a mid-term framework of budget management and expenditure, and into a development and economic policy. When implementing the development strategy, the makers of development and economic policy should be focused on the results of development. A multi-variant approach is needed, so that the existing policy could be corrected on the level of the general strategy and particular policies

In a desirable development strategy for the domestic economy, the most important development objective is achieving sustainable development. The starting points for achieving this objective are the existing structural imbalances, the incomplete reform of the economic system and insufficiently developed market institutions, as well as the need to enter the regional and the global markets. The initial steps in recovering the domestic economy can be based on an increased use of existing capacities, but a successful return to the global market requires a structurally transformed economy. This means that privatisation (as well as other elements of corporate restructuring) is very important as a necessary step, but the development of new small and medium enterprises is more crucial, since it is essential for significant increase in production, the development of new competitive advantages, the successful appearance in the global market, and taking care of surplus labour. Finishing the reform is of essential importance.

According to Hadžić M. (1998), the objective of sustainable development could be made operational through:

- Economic transition toward market economy
- Structural adjustment, restructuring companies and banks
- Strategy of opening up to the global market

One of the basic conditions for achieving sustainable development is undergoing the process of transition, i.e. transitioning from an inefficient economy towards a market oriented one. The process of transition entails

complementing the market economic system with market institutions and legislation. This requires changing the existing and creating new legal stipulations that would correspond with legislation in other market economies, especially the legislation in the EU. Apart from passing a series of new laws and changing the existing laws to match international market standards, there is ample room in legal execution, especially in the domain of property law and contract law.

Privatisation entails synchronous activity in several domains, and various models gain different importance in time. Creating the conditions for smooth functioning of the markets – the market of goods (commodities and services), the market of production factors (labour and capital) and the property and other exchange values market of – entails establishing the absent and building the existing institutions, an increased level of competitiveness, the beginning of politics of competitiveness, the beginnings of anti-monopoly legislation, obeying legal regulations, and opening the market to foreign economies.

The aim of undertaking structural adjustments and restructuring companies and banks is to create a critical mass of economic actors capable of operating under strict budget constraints. If economic actors are unhealthy, the reaction of the economy to the economic policy is inappropriate, and the effects of measures undertaken inadequate. The policy of structural change should be aimed at overcoming the existing structural disproportions, increasing the share of tertiary activities in the GDP, increasing the importance of small and medium companies and the private sector in the economy. Macroeconomic restructuring entails changing the structure of supply so as to increase the standard of goods and services, specialisation, standardisation, and product quality. On the microeconomic level, the course of action is two-directional: *offensive* in terms of creating new enterprises, primarily in tertiary branches, in terms of creating small and medium private enterprises oriented towards foreign markets, and *defensive* in terms of a comprehensive corporate restructuring, especially of those companies that have problems, that includes changes in organisation, property, finances, program, technology, and labour.

The process of restructuring includes the banking (financial) sector. This process involves financial consolidation and rehabilitation of banks, which is to a great extent on its way. An important element of restructuring the financial system is its opening towards the global market. Initial steps have been taken by giving licences to foreign banks and initiating mergers with foreign banks. In the process of developing the financial market, the necessary legal regulations are still unfinished.

The strategy of opening up to the global market stresses the importance of joining international economic flows and intensifying foreign trade exchange. This orientation can be achieved by giving priority to the entire export sector, which is very important for overcoming the limits of the domestic market. A more intense participation of local enterprises in the global economy increases the competitiveness of local enterprises because it motivates them through the process of liberalisation. The aims of implementing a development strategy oriented towards the global market are the greater competitiveness of the domestic economy, increase in economic efficiency and specialisation in manufacturing and services. The policy of opening up should be based on a real and stable exchange rate of the dinar, the liberalisation of import and export, opening up to foreign investments and encouraging them.

THE FRAMEWORK FOR STRATEGIC PLANNING OF THE TERRITORIAL DEVELOPMENT OF INDUSTRY

One of the paradigms in planning the development and spatial distribution of industry is optimisation and efficiency of functions and activities, superstructure and infrastructure, blocks of buildings, particular buildings and industrial plants. Strategic development planning entails determining the mode of spatial organisation for achieving (allocating) development programs and is, also the means for introducing and scrutinising planning ideas (see Zeković S., 1997). Strategic planning for developing a particular area on all levels entails orchestrating available/key resources to create competitive advantages, along with choosing planning frameworks, objectives and determinants. *Strategic planning of territorial development entails managing and creating change*, i.e. ways of restructuring the development process in its socio-economic, spatial and ecological context, new spatial organisation, creating a role for new development and location factors, the change in the role of space and "ecological factors", the change (decrease) in the number of levels of management, better management in the domain of particular parts/entities, etc.

Approach and Principles in Creating the Spatial Development of Industry

Strategic development planning entails different methodological approaches and development planning activities. Based on the experiences of countries in transition, and in accordance with the EU principles of spatial planning and principles of sustainable development, new trends in spatial planning are directed towards changing the methodology and the content of planning. In the period of transition towards market economy and changes in the socio-economic system, the basic principles of strategic development have been significantly changed in comparison to recent practice due to new turbulent changes in all economic, social and spatial systems.

One of the key issues in creating a new approach to strategic planning of the spatial development of industry are the attitude to new, turbulent changes, and environmental conditions, expected changes (in the professional methodological portfolio), and the acceptance of external, real and rapidly growing changes in the socio-economic, political and other domains. The acceleration of strategic changes is apparent in the socio-economic environment. These changes can be classified into three types:

- evolutional changes (in small increments)
- disruption of balance (for example, the decrease in the number of management or decision making levels)
- revolutionary changes.

The character of these changes can be (1) incremental – (a) fine-tuning changes and (b) adjustment, adaptation, or (2) truly transformational/transitional, through (a) planned transformation or (b) forced transformation. The role of strategic planning in the case of incremental change of the adjustment/adap-

tation type and the transformational change of the forced type is reactive. The role of strategic planning is proactive in the case of incremental change of the assessment type and in the case of planned/created transformation (Table 1).

Table 1: Types of Strategic Change – Nature of Change (According to Mašić B., 2003)

The Role of Strategic Planning	TYPE OF CHANGE	
PROACTIVE	1. Incremental Change	2. Transformational Change
	a) Fine-tuning	a) Planned Transformation
REACTIVE	b) Adaptation	b) Forced Transformation

The change in the Role of Space and Location Factors in Planning Industrial Development

Earlier theory and practice of strategic planning of industrial development and planning particular industrial investments gave relatively little importance to space and the environment. However, due to greater awareness of the increased role of space and the environment as limiting factors in planning industrial development, "conflicting" approaches to managing location and ecological aspects of future investment moves have appeared. According to traditional economic theories, it is investment of capital and employment that determine industrial development, whereas technical progress and the location are not taken into account. However, the neoclassical theory of proportional factors, which does take into account technical progress, points to the special importance of location economies, as an effect of the spatial distribution of industry. It also points out to the importance of agglomeration (urban) economies in planning industrial development. Nevertheless, from the standpoint of spatial planning of industry, contemporary experiences in developed countries indicate a radical change in the role of location factors.

According to the contemporary approach, leading industrial location factors are highly educated labour, scientific research and development institutions, the university, the market, large regional infrastructure, urban innovation infrastructure (urban and location economies, production funds, urban services, infrastructure, quality of life, the aesthetic qualities of the city, etc.) There is extensive research on location factors and criteria for high-tech industry, and the theorists differ in their viewpoints (Markusen A., Hall P., 1986; Scott and Storper, 1987). Some theorists (Scott and Storper, 1987) reject Markusen's theory on unique location factors of high-tech industries, emphasising highly educated labour and agglomeration (grouping) economies. Saxenian (1993) supports the thesis that the agglomeration of high technology (in developed centres and less developed areas) aids synergy factors and has many spatial and infrastructural attributes.

The methodology and procedure of making relevant analyses in the process of planning industrial investments should be modified and coordinated, taking into consideration the key importance of industrial activity, not only in the socio-economic sphere, but also in spatial use and organisation, the influence of industry on the quality of the environment and changes in spatial structure, as well as the gap between theoretical knowledge and our practice. In order to reach a "sustainable " harmony between industrial development and spatial factors, the emphasis in structural and spatial planning should be on providing ways to integrate space and the environment into socio-economic development. In this manner, ecological "health" of the country, the region, and the local community would be preserved. The function of planning and public responsibility is the optimisation of industrial development, energy production, transport, human settlements, tourism and recreation, services and infrastructure, in accordance with the capacities of the environment. Thus the connected planning of all these segments is an especially important aspect of socio-economic, spatial and ecological cohesion of the urban/regional environment.

CONCLUSION

The transition of the economic system towards market economy leaves deep traces on the development and spatial planning policy as well as on industrial planning in Serbia. The complexity of planning economic investments in our country means that a large number of investment projects will be realised in accordance with the legal framework on privatisation (as part of existing plants/sites), that a number of investments will be realised as new investments of the private entrepreneurial sector, or as a partnership between the public and the private sector, whereas a number of investments will be realised through direct foreign investment in establishing new companies. On the macroeconomic level, establishing new companies is key to the success of transition towards market economy because it creates more workplaces and new employment for surplus labour, i.e. jobless workers. Thus the strategy of development and transition toward market economy should be based on policies and measures that stimulate sustainable economic growth.

Strategic planning of the territorial development of industry means managing change and creating change, i.e. ways to restructure the process of development as part of its socio-economic, spatial and ecological context. It also means creating and managing new spatial organisation, the role of new development and location factors, changing the role of space and "ecological factors", changing the location performance of industry and creating new "aggregate" forms of industrial location. The priorities of spatial development are usually determined in the strategic frameworks and provisions of development and plan documents, economic and sectoral policies on the level of the republic and the local level.

The strategy of economic development of Serbia should be shaped by general socio-economic conditions and a belief in: (a) continuing the process of restructuring the economic system and the economic environment, as well as the process of transition towards market economy, and the process of changing property, market, macroeconomic, production, program and other policies; (b) opening the country and the economy to all kinds and models of direct foreign investment; (c) establishing an adequate market and plan mechanism in providing construction lots for locating economic content/investments; (d) introducing transparent approaches and regional models of spatial development, use, organisation and protection, based on the principles and criteria of sustainable development, the application of ecological management and

quality standards; (e) taking into account changes and "new" requirements in the regional policy of spatial development; (f) the need to coordinate regional plans/projects with European strategic and structural initiatives, plan statements, propositions, standards – for example, establishing companies, economic restructuring, building infrastructure, environmental protection, humane development, etc.

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RESIDENTS' VIEW ON RESETTLEMENT ISSUE OF VREOCI – SUSTAINABILITY OR PHRASES –

Jasna Petrić

Further expansion of Kolubara lignite basin indicates a necessity to limit future territorial encompass and spatial development of the present semi-urban settlement of Vreoci which is located some 50 km to the south from Belgrade. There is a part of Vreoci which has already been expropriated for the purposes of lignite exploitation, yet the possibility to resettle the town as a whole is still to be validated according to appropriate technical documentation and the feasibility study. Having that estimation of the total cost for such a venture so far showed to be unreliable, the Institute of Architecture and Urban & Spatial Planning professional team was engaged by the Electric Power of Serbia state company in order to prepare and conduct a questionnaire study on conditions for total resettlement of Vreoci. Before the actual fieldwork took place in June-July 2005, citizens of Vreoci were well informed on the questionnaire content and the interviewing period. The questionnaire was thus conducted through face-to-face interviews with one representative per household who could give all relevant information concerning this study. Though the questionnaire covered information on households as well as on their premises (general facts about constructions built on the household lots), this paper is focused on the first type of information and makes an emphasis on residents' opinion regarding viable/ sustainable options for their resettlement.

Key words: ***lignite exploitation, questionnaire study, household, opinion, resettlement.***

INTRODUCTION

According to a number of findings, in the central zones of lignite exploitation, the initiation of a principle concentration of population, activity and territorial development happens mostly because of development of lignite mines, and the consequent provision of infrastructure and development of production plants (see: IAUS, 2005; **Spasić, Jokić, 2004**). This can also be inferred for Kolubara lignite basin, which stimulates urbanisation of settlements in the basin that accommodate plants for coal processing and refinement (e.g. Vreoci, V.Crljeni) as well as it induces development of surrounding towns, e.g. Lazarevac, Ub, Obrenovac, Lajkovac.

The "productive area" of Kolubara lignite basin, i.e. the area which contains lignite resources, covers up the territory of 520 km^2 whereas the actual exploitation surface equals 130 km^2 according to the present estimation. Over time, an intensive utilization of lignite coal reserves has consequently produced the following outcomes: redirection of water courses, spatial relocation of infrastructure systems and relocation of certain parts or whole of settlements, which implies that residents have to resettle if their place of living is existentially threatened by such courses of action. One of the possible scenarios which Kolubara lignite basin exploitation may impose in the near future implies that the resettlement process[1] will only intensify, and in line with this proposal, the whole settlement of Vreoci may be expected to relocate.

According to the last Census (2002), Vreoci had 3,210 inhabitants living in 1,088 households (**Republički zavod za statistiku Srbije**, 2004). The total area which is encompassed by this settlement equals 1,879 ha. It should be

Lignite exploitation field in the background of the already expropriated estates in Vreoci.
Source: Ines Urošević (July 2005)

[1] Resettlement is regarded as the entire process of relocation (moving people, assets and infrastructure) and rehabilitation caused by project related activities, i.e. lignite exploitation.

pointed out that there is a part of Vreoci which was already expropriated for the purposes of furthering the process of lignite exploitation ("Tamnava-istok", Field "D", industrial plants, etc.). Majority of REIS [1] plants (plants for coal refinement, thermal plant, plant for production of gasconcrete, etc.) is located at the territory of Vreoci. However, because of the already formed settlement structure as well as because of the planned expansion of lignite surface exploitation, these plants have had a limited chance to expand and develop, which would presume even further deterioration of hard environmental conditions in Vreoci.

Relocation of Vreoci would certainly represent a giant and complex task as well as it would be a delicate mission. Though the settlement (especially its cemetery) is situated right above important lignite reserves, justification for exploitation of these resources still has to be verified against the 'costs' of resettlement process so that final decision upon future status of Vreoci can be made. This decision is above all important for protection of Vreoci population in order to allow them to pursue their civil rights, i.e. right for subsistence – to enjoy a healthy environment; security; private property rights; etc. Even if the decision is made to keep Vreoci at its present location, nevertheless it is necessary to employ certain measures in order to mitigate present environmental degradation and to achieve certain level of the quality of life and living standards for Vreoci residents.

On the other hand, the issue of voluntary or involuntary resettlement needs to be dealt with at the onset, as it may also function as a potential red herring, or distraction. One position is that only cases where people wish to move can be regarded as successful (de Wet,1999:3; Cernea and Guggenheim, 1993). However, involuntary resettlement can be conducted in such a way that people who had to leave their place of residence find themselves better off in almost all respects in their post-resettlement situation – except that they had a negative view on resettlement issue before the process took its place.

From the voluntary or involuntary resettlement perspective, prior to reaching the final decision for Vreoci, it is interesting to observe whether its population consider the resettlement as sustainable (viable) solution and which modality of resettlement (if any) they are most likely to accept.

GENERAL OUTLINE OF VREOCI HOUSEHOLDS AND POPULATION STRUCTURE

The main features of Vreoci households are by and large those which characterise semi-urban settlements with mix of nucleus families (parents and children, a single parent with child/children) and extended, three-generation families. According to the data obtained from a selection of conducted questionnaires (in the sequel: questionnaire selection), which covered roughly 40% of the total number of Vreoci households that have been encompassed by the survey, the average number of members per household in Vreoci was 2.9, where 1/4 of the total number of households consisted of two or more families. Traditionally, there is a certain number of kinship households which tend to group in the same neighbourhoods.

People of Vreoci have entered the population aging phase. According to the questionnaire selection, there is slightly less younger people (19 years old and younger) which account for 19.6% in the total, in comparison to the old population (60 years and above), latter having the intake of 21.3%. In the questionnaire selection, which shows a large correspondence with the total population age structure, there is a significant proportion of Vreoci residents who are between 40 and 59 years old (32.4%), and they are followed by the age group of 20 to 39 year olds (26.7%). Regarding gender structure of Vreoci inhabitants, there has been slightly more women (51.7%) than men (48.3%).

The majority of Vreoci working population (87.6%) is engaged in the public sector activities, and the large number of such employees works in the Mining Company "Kolubara". The data confirms that there are almost two-thirds of Vreoci employees who have been working locally. In case of resettlement, the main cause of hardship may be loss of economic opportunities (Deruyterre, 1999:3). This situation would most likely require a sound concept of social program which could be offered to certain groups on the one hand, and/or specific measures on the other hand, that would emanate the development of a private sector (IAUS, 2005:16). Regarding the primary sector activities, Vreoci households are partly engaged in agriculture production which, in most cases, is performed only for domestic use. A ratio of pensioners in the whole population of Vreoci was 17.6%. Regarding the number of schoolchildren and students, the survey showed there were 215 primary school pupils in the settlement, whilst 34 pupils attended primary schools outside Vreoci. Following this, there were 134 secondary school pupils and 88 college/ university students with home residence in Vreoci.

STRUCTURE AND CONTENT OF THE QUESTIONNAIRE

The main purpose for conducting a questionnaire study of Vreoci households was to recognise and comprehend their attitude towards potential mode of resettlement, in case this scenario is to be pursued. This questionnaire was to provide *first-hand information* which, if this project proved to be justified, would serve future development of detailed resettlement programs offering a choice of locations for organised resettlement of Vreoci households that opted for a collective move.

The questionnaire consisted of two parts. First part covered the questions on households and conditions for Vreoci resettlement, and the second part referred to making a record of general information on Vreoci house lots and the household premises. Though the second part of the questionnaire was equally important (especially for generating estimated costs for a total resettlement of Vreoci), this paper has been restricted to analysis of data from the first part of questionnaire, which consisted of the three types of questions: 1) basic household information; 2) a choice of resettlement modality and potential location choices for a new settlement; and 3) relocation of Vreoci cemetery and registration of graves which are to be moved to the new cemetery location.

Explanation of the questionnaire procedure and criteria

Once the questionnaire content was accorded with local community representatives as well

[1] REIS – Mining-Energy-Industrial System

as with representatives from the Electric Power of Serbia state company (in the sequel: EPS), the actual fieldwork was started. People of Vreoci were informed well in advance about the content and the time-scale of the questionnaire survey. Additionally, principal explanations regarding aim and motives for conducting the questionnaire were stated at the front page of a questionnaire. However, in case of any other queries by Vreoci people, interviewers were prepared to clarify doubts and give accurate information. It was especially emphasized by the questionnaire that any given answer did not oblige household members to make an identical choice if the resettlement of Vreoci should actually happen. Also, it was decidedly stated that any given information in the questionnaire must not be used neither as the basis for expropriation nor for any reason other than aims of this study.

Response rate and refusals

Regarding actual fieldwork, the questionnaire on Vreoci households was efficiently conducted and generally was well accepted by the residents. In reference to the questionnaire selection results, out of 433 visited households, there were merely 8.3% that either refused to give information or were somehow prevented from responding to the questionnaire due to illness, permanent absence, temporary unavailability, etc.

It is important to stress that the majority of households which explicitly refused the questionnaire survey did not show any hostility towards interviewers. Sometimes they would gladly host the interviewers for an informal talk, but would refuse to participate in the questionnaire survey (e.g. to respond to all or some of the questions), hence such a decision was always respected. It is interesting to register some of the passing comments which came out of the informal talks with those residents of Vreoci.

First of all, there was a number of refusals that were motivated by resident's dissatisfaction with 'countless number of previous questionnaires that had circulated the settlement', which proved no benefit either for individuals or for the whole community of Vreoci. A few refusals were motivated by troublesome personal relationships between residents on the one hand and the local community representatives on the other. Also, a significant number of citizens who rejected the questionnaire were resentful because of negative experience with some previous actions that accompanied similar resettlement plans in which affected population ended up as losers. These residents stated that head people of EPS have been the main culprits for trickery and deceit of population involved when the previous resettlement actions took place, e.g. affected residents received insufficient imbursement for the value of their expropriated assets. In addition to this, a group of resettling population in the past was a victim of false promises that EPS would have refunded lost land to the households by provision of jobs in "Kolubara" for their younger family members (IAUS, 2005:57). Such residents most commonly say that they believe no 'pie in the sky' and would only accept talk/negotiation with the 'real Komisija'* when it comes to evaluate their non-movable assets in Vreoci.

* 'Komisija' is the expression commonly used by the local residents of Vreoci to note a group of experts who, as a part of compensation process during the resettlement, would visit individual households in order to make detailed calculation of individual property value in monetary terms.

FINDINGS OF THE QUESTIONNAIRE SURVEY

A typical attitude for the majority of Vreoci population was that it was high time to bring a final decision on destiny of this settlement in order to eliminate uncertainty in which citizens had been living for a number of years and which had prevented them from planning and realisation of their needs, e.g. potential alterations to their present houses, development of new buildings, larger investment actions, etc. (IAUS, 2005:17).

The largest number of surveyed households called for acceleration of the decision-making process regarding potential resettlement of Vreoci, and they also asked for fixing up that period to 2 years at maximum. They discarded a long-term plan for Vreoci resettlement, e.g. the one which would realise within a 10 years' period, and they were against partial resettlement – the whole settlement of Vreoci should be encompassed by the process which would happen in one or two phases at most (IAUS, 2005:57).

Residents' attitude towards potential resettlement of Vreoci

It can be noticed that within surveyed population of Vreoci there have been various attitudes expressed regarding the resettlement issue. These attitudes could be linked to the residents' age, economic and educational status, and last but not least – environmental condition sufferings.

Apparently, those residents who were most directly affected by damaging environmental conditions caused by extreme pollutants, for example, people living in Gasbeton and Šušara's immediate surroundings where the real ecological catastrophe has been happening, expressed the strongest wish and demand to be resettled as soon as possible.

Three generations of Vreoci citizens.

Source: Ines Urošević (June/ July 2005)


Vreoci people when asked about potential resettlement

Source: Ines Urošević (June/ July 2005)

Though the whole settlement is affected by the factual pollution caused by general proximity of lignite exploitation fields and industrial plants, there were some Vreoci residents who denied this problem and its real consequences for public health, which have been epitomised in frequent asthma cases, chronic bronchitis, renal and malignant illnesses.

According to the sample data, younger Vreoci residents were more inclined to resettlement, and in most cases they emphasized they would prefer not to be limited by any 'imposed' choices. Those who opted for organised resettlement were inclined towards Belgrade, yet at the same time they were aware it would be difficult to obtain a location for the new settlement outside administrative territory of Lazarevac municipality. Generally speaking, both younger and older population didn't see Lazarevac as the magnet, considering it to be 'a dead town, which after exhaustion of lignite exploitation, wouldn't have any major sources of income'.

Older Vreoci citizens were split in two in their attitude regarding the resettlement issue. For example, some of them were aware of already difficult living conditions in the settlement, and though not happily, they would accept to move. Another group of senior citizens completely declined a possibility to leave Vreoci. For example, they made comments such as: 'in case the resettlements would take place, in due time it is more likely that we (senior citizens of Vreoci) would move together with dead and not with the living residents'. Generally observing, the main reason for negative attitude towards resettlement of the senior Vreoci citizens can be found in their old age and in a single household living. If these groups of citizens are to move, they are confronted with a difficulty to develop on their own a new house in a different environment. Therefore, some older and single households would prefer if EPS would build them the houses or provide them with flats in the place of organised move. There were some senior Vreoci citizens who would leave the decision on resettlement to the younger members of their family. They would prefer to move together with their children and grandchildren and to stay in multi-generation households. Beside family ties which may orient direction and resettlement mode for a number of Vreoci households, it is interesting to mention that certain neighbourhood/ territory groups opt for the same resettlement choice and the location which would allow them to stay physically close to each other in their new environment.


Senior Vreoci citizens

Source: Ines Urošević and Tamara Maričić (July 2005)

Resettlement modality

One of the key issues covered by this questionnaire survey related to modality of resettlement for Vreoci residents in case the whole place is to be relocated. Basically, the citizens were asked whether they would prefer to go for *individual relocation*, i.e. compensation as full payment for their property at cadastral territory of Vreoci, or they would rather opt for *organised resettlement*. This latter modality is defined in the questionnaire as follows: 'In case of organised resettlement, EPS would provide built-up land in order to form the new settlement. Citizens of Vreoci would be then offered one of either three types of parcels – urban type of parcel (0.06 to 0.07 ha); mixed-type of parcel (0.1 to 0.17 ha) and rural type of parcel (0.3 ha). Organised resettlement would also encompass the following obligations by EPS: land provision and its division on parcels, organisation and financing of regulatory plan preparation, investment and organisation of the communal, transportation and other infrastructure supply as well as the development of public buildings. EPS would finance provision of links to communal infrastructure at the new location which would be chosen for organised resettlement, whereas in the expropriation process the value of already provided links in

Vreoci wouldn't be taken in account. (...) Built-up land (parcels) that are to be provided for the resettling households of Vreoci would be in their private property. Households are left to develop on their own any houses/ buildings on such a parcel. EPS is also committed to compensate difference in value between household's present parcel in Vreoci and the new parcel which would be provided for them in the newly organised settlement'.

Once again, during the interviewing process with Vreoci household representatives (conducted for the purposes of this questionnaire survey), it was stressed that by present choice of either of the two options for resettlement modality, households would not be obliged to make the identical choice should the resettlement process come to be realised one day. In this preparatory phase for reaching a decision, the issue is to recognise potential aspiration(s) for resettlement of Vreoci households, which would facilitate development of future generation of thoroughly elaborated and precise resettlement options.

In reference to the issue of resettlement modality, data which is obtained for the whole population of Vreoci provided the following information which is given in the Table 1.

Table 1: Resettlement modality for Vreoci households

RESETTLEMENT MODALITY	POPULATION (1,141 households.)*
Individual relocation	46.7%
Organised resettlement	29.8%
Other (refusals, unavailable, undecided, expropriated property)	23.5%

* Data for the total number of Vreoci households are the sum of results provided by all 5 teams from IAUS which were engaged in Vreoci survey, where each team consisted of 2 researchers. Source: IAUS (2005:52).

Figures from the table above show that almost half of Vreoci households (46.7%) would currently opt for an **individual** relocation. Whether they believe or not in fair compensation, that is another issue. When commenting their aspiration towards individual relocation, majority of these respondents stated they would prefer 'to get the cash and go as they please'. Thinking about their future prospects, some more affluent households of Vreoci have already bought the property in another place, thus only considering the financial compensation from resettlement process.

On the other hand, one can notice in Table 1 that almost 30% of Vreoci population would currently decide on **organised** resettlement. In the questionnaire, people who opted for this type of resettlement modality were given a choice of 4 locations (Rasadnik, Crne medje, Petka, Šiljakovac), most of them at the territory of Lazarevac municipality, but these locations served only as an indication for possible organised resettlement options. Additionally, residents of Vreoci who would like to move in an organised manner and who preferred any other location apart form those 4 mentioned could name it in the free space by the question of concern.

As it can be observed from Table 2, the largest number of Vreoci households which opted for 'organised resettlement' (approximately 1/3 of them) would want to move to some place within Belgrade administrative territory - **Železnik, Žarkovo, Čukarica, Petlovo brdo, Ovča, Sremčica, to name a few. Most commonly,** people who would like to move towards Belgrade explained that this opinion was motivated by the wish to avoid 'repeating a same mistake' which happened in the 1980s when people from nearby villages of Cvetovac and Medoševac were resettled to Vreoci, and in their belief, that was due to bad estimation and the lack of long-term strategy for lignite exploitation.

Among the locations that were listed in the questionnaire, Rasadnik takes a lead with approximately 20% of households which opted for organised resettlement. It is slightly more emphasized choice than Petka (rural type of location which attracted 11% of respondents) or Šiljakovac (greenfield site by the main road to Belgrade that represents a preference for 11% of Vreoci respondents). Finally, as a potential location listed for a resettlement, Crne medje attracted merely 3% of respondents.

Lazarevac which is the closest urban centre to Vreoci has been seen as an attractive place for resettlement by almost 9% of respondents. This percentage includes already mentioned vulnerable groups of residents (old and single households) who would prefer EPS to provide them with a flat in Lazarevac rather than any other option.

Table 2: Locations for a future settlement according to Vreoci households opting for a collective move

LOCATION	POPULATION (346 households.)*
Rasadnik	21.1%
Crne medje	3.0%
Petka	11.0%
Šiljakovac	11.0%
Belgrade territory (e.g. **Železnik, Žarkovo, Čukarica, Petlovo brdo, Ovča, Sremčica,** etc.)	33.5%
Lazarevac (including requests for provision of flat in Lazarevac)	8.7%
Other (including undecided, majority decision followers, etc.)	11.6%

* Data for the total number of Vreoci households are the sum of results provided by all 5 teams from IAUS which were engaged in Vreoci survey, where each team consisted of 2 researchers. Source: IAUS (2005:52).

Last of all, almost 12% of Vreoci households that chose organised type of resettlement listed some other option apart from all previously mentioned. This group of respondents also includes people who would like to move in an organised way but are still undecided about potential location for such move, or they say they would follow the decision of majority in case the resettlement of Vreoci would happen.

Issue of Vreoci cemetery displacement

One of the most delicate issues covered by this questionnaire survey related to the local cemetery relocation. People who were responding to this question were only those who had their deceased relatives buried in Vreoci. From obvious sentimental reasons, certain respondents completely denied possibility to have their dead relocated to any other cemetery. They emphasized as an argument that Vreoci cemetery as a whole could not possibly be relocated at least for a while (10 years as a minimum according to the present law) because the dead had still been buried here, i.e. local funerals have not yet been proscribed. The factual problem is that present Vreoci cemetery is the first in danger-line because of spread of the lignite exploitation field "D". Because the lignite excavation already came so close to the

cemetery, people of Vreoci express their fear that the sliding of graves would soon start spontaneously.

Regarding potential new locations for Vreoci cemetery, there was a high level of accordance in this respect between families of deceased. Most of them (44% of respondents with deceased relatives in Vreoci) thought how at least the dead should 'remain together' when being moved, i.e. they opted for a new cemetery location to be in the place where the majority of Vreoci residents would resettle. Conversely to this opinion, 20% of respondents said they would like their dead to be moved from Vreoci cemetery to a cemetery of that place where the respondents would individually go. Other respondents (36%) named individual locations for the displacement of their dead, e.g. Petka, **Šiljakovac, Lazarevac, Crne međe, Šopić, etc.**

People of Vreoci were frequently saying that 'all this talk and business about resettlement has to do only with the necessity to displace Vreoci cemetery, which supposedly lies on top of major lignite resouces, much richer than those lying underneath the rest of Vreoci'. Consequently, local community conditioned Vreoci cemetery relocation with synchronised and time-fixed resettlement of the whole town.

CONCLUSION

Involuntary resettlement can have a dramatic impact on the lives of people inhabiting the area of influence of large-scale development projects, e.g. lignite and energy production expansion territories. The resettlement process may represent a sudden break in social continuity and can result in impoverishment of the people who are to be relocated. It can threaten people's cultural identity followed by disruption of social networks and diminishing of people's sense of control over their lives.

In defining options for Vreoci resettlement it should be borne in mind that a significant number of citizens is attached to the settlement and experience it as a natural habitat. With this in view, in case the resettlement of Vreoci is to be pursued, the whole process should be conducted in cooperation with the local residents so that their needs and preferences are met. Only in this way their relocation would become least painful and would allow continuity of neighbourhood social ties. Such a position is not simply unrealistic moral posturing, although it does take the moral standpoint that we must start from the assumption that constrained parties should be seen as potential beneficiaries, and that this should be built into the project planning and implementation process as a non-negotiable element, on a par with things such as construction schedules.

When regarding resettlement of Vreoci as an opportunity for true sustainable development, at minimum, it should provide full compensation for the loss of its residents' assets and income. Displaced people must not be made to subsidize the main project through unfair compensation, and should receive full replacement value for their assets.

A final point to be underlined is that resettlement of Vreoci must be understood as a process that has to be planned for and analysed over time so that its residents end up better-off than before the resettlement in a number of ways, which need to be sustainable over time. The process has started as soon as the people of Vreoci have been made aware that they might be the subject to resettlement, and will continue long after completion of the project as it may take a long time for people to re-establish themselves in their new sites.

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APPLICATION OF EIA/SEA SYSTEM IN LAND USE PLANNING – EXPERIENCE FROM SERBIA –

Božidar Stojanović

This paper discusses the experience and current status of EIA/SEA procedures and assessment methodologies in Serbia, aiming to propose strategies that can lead to effective integration of the SEA in spatial planning. Institutional and practical problems with regard to the regulations of EIA/SEA were considered. Expirience from the past decade shows that implementation of EIA system in Sebia has not been effective as expected. New legislation on EIA and SEA is harmonized with coresponding EU Directives. First steps in the application of the SEA show that the main issues are screening, scoping and decision making. According to the research results, it is suggested that extra evaluation processes should be incorporated into current assessment procedures to improve their scientific validity and integrity.

Key words: strategic environmental assessment, spatial planning

INTRODUCTION

The main aims of Strategic Environmental Assessment (SEA) are: (1) to overcome limitations of the project-level EIA by considering key environmental issues earlier in the planning process and addressing cumulative and synergistic impacts, (2) to introduce environmental and sustainability considerations in the formulation of strategic actions, and (3) to contribute to policy appraisal, thus, making strategic decision more structured and transparent.[6] SEA is especially relevant in the context of countries with transitional economies where numerous strategic choices with significant environmental implications are being made and where changing institutions present opportunities for introducing innovative procedures of environmental decision-making.

Currently, SEA systems are in place in more than 25 countries, and the number is likely to increase now that EC Directive 2001/42/EC has come into force in member states. The suggested EIA process is modeled on the EIA Directive 97/11/EC and applies its procedural elements. The SEA Directive will have international scope, because the transitional European countries will be required to comply with the EC Directive. The Directive has also strongly influenced the SEA Protocol to the UNECE Convention on EIA in a Transboundary Context.

Most of the countries of Central and South-Eastern Europe have adopted legal provisions for some form of SEA within the framework of their Environmental Assessment legislation. In addition to adopting these formal provisions, many countries have acquired some practical experience of using SEA during the last decade. The question is whether these developments have met the expectations of the societies, which have simultaneously been trying to achieve economic, environmental and democratic improvements?

In Serbia, the Environmental Impact Assessment (EIA) has been implemented over the past 15 years and contributed promoting the consideration of environmental factors in certain types of spatial and urban plans, but not as effectively as expected. On the other hand implementation of a new approach in the EIA and SEA practice has been evolving since transposition of corresponding EU Directives.

This paper provides a brief review of impact assessment practice in Serbia, based on experience with implementation of the EIA and SEA legislation in the land use planning during 1992–2005. Particular attention was paid to the key issues identified in the early stage of implementatation of new Law on SEA.

LEGISLATIVE BACKGROUND

The Environmental Law of the Republic of Serbia (as amended and published in the *Official Gazette of RS*, No. 66/91 and 53/95) mandates an EIA for certain types of projects and activities, particularly those that may have significant negative impacts on the environment. The aim of an EIA is to establish necessary conditions and measures to prevent and mitigate environmental threats.

The Regulation on environmental impact assessment of facilities and activities (*Official Gazette of RS* No. 61/92) stipulated that an EIA

is carried out in two stages: 1) preliminary EIA, based on the concept of project and alternative locations; and 2) detailed EIA, requiring further investigation and preparation of an environmental mitigation and monitoring plan. The content of a detailed EIA report was fairly consistent with the EU Directive 85/337/EEC.

An EIA has been carried out for projects in the industry, agriculture, energy, mining, transport, etc., including activities in protected areas and cultural heritage sites. A list of 12 broad sectoral and 58 project activities that are subject to mandatory EIA, with some threshold values, has been attached to this regulation.

In its first years EIA was applied mainly to the development projects. But since 1995, when the new Law on spatial planning and the Law on building (*Official Gazette of RS*, No. 44/95) were adopted and published, EIA became closely connected to the processes of planning, building and permiting (see: Figure 1). The Spatial planning Law required preparation of an environmental impact assessment of proposed land use in the plans of industrial zones, energetic facilities, main infrastructure corridors, water supply reservoirs, etc.

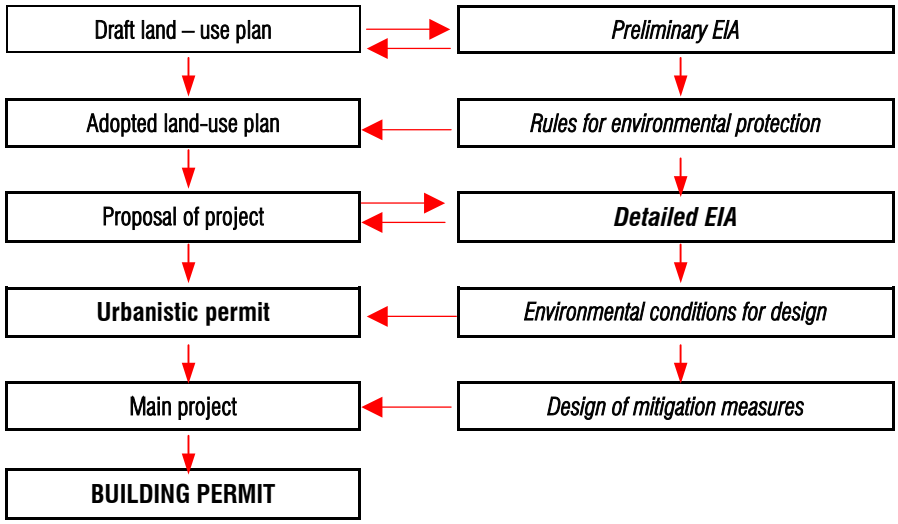
Since democratic changes in Serbia (2000) the process of approximation to the European Union started with the projects for transposition of EU legislation in Serbia. In this context a set of environmental protection laws were adopted in 2004, including the Law on strategic environmental impact assessment (*Official Gazette of RS*, No. 135/2004), which is in compliance with the EU "SEA" Directive 2001/42/EC.

The new Law on planning and building adopted in 2003 (*Official Gazette of RS*, 47/03) unfortunately did not recognized the importance of an environmental assessment of land use plans and did not explicitely included EIA or SEA procedures in the planning process. So there is need for revision of this Law and integration of SEA in the land use planing process.

CHARACTERISTICS OF THE EIA PROCESS 1992-2004

The environmental authority (MoE) has a dominant role in the EIA process, whereas the developer is responsible for the preparation of an EIA report. Quality and effectiveness of EIA practice have not been monitored systematically, due to nontransparency of the EIA process and a lack of access to EIA reports for the experts, profesional organizations and public. This breaf review about characteristics of application of the EIA regulation in Serbia was produced on the basis of its contents and procedure and scarce information on the effectivenes of environmental assessment process in practice.

Figure 1 - Integration of the EIA in planning and building process



Administrative framework	Approval of EIA by Min. of Environment (MoE)
Screening	58 project categories
Scoping	Preliminary EIA defines the scope
Review of EIA reports	MoE officers; methods unknown
Public information & participation	Not stipulated by the Law[1]
Guidelines for EIA preparation	Not available
Number of prepared EIA reports	50-60 (1994), 1300 (2001)[2]
Quality of EIA reports	50% unsatisfactory (1995)[3] ; 90% (2002)[4]

Data from table shows that effectiveness of EIA practice in Serbia has not advanced beyond basic level. This reflects the lack of resources, procedural controls and methodological guidelines.

KEY ISSUES IN THE IMPLEMENTATION OF NEW SEA LEGISLATION

Although there is some experience in the integration of certain elements of SEA in the spatial planning[5], new SEA Law represents a challenge for environmental and land use planning experts, as well as for competent state and local authorities. Many important issues in early application of new SEA system in the land use planning process have been recognized in all the phases of SEA procedure, which includes:

- *Screening*, i.e. determining plans and programs' (P/Ps) need to be screened for likely significant environmental effect and appropriate extent and type of SEA,
- *Scoping*, that determines a content of the SEA report which includes: identification of objectives of SEA and indicators, baseline data, assessment of the likely significant effect of P/Ps, mitigation measures, recommendations for preparation of SEA/EIAs on the lower hierarchical levels, monitoring program, description of methods applied, etc.
- *Decision-making process*, that include: participation of interested authorities and organizations, public participation, transboundary consultation, reviewing of SEA report, approval of the SEA by competent authority and access to the information.

Screening is the starting point for SEA application, and the most critical issues at this

moment of implementation of SEA are determination of the need for SEA of particular P/P, scope and type of SEA. As stipulated by the Law (Art.5), an environmental assessment (SEA) shall be carried out for plans and programmes (P/Ps) as follows:

a) all P/Ps which are prepared for spatial and urban planning or land use, agriculture, forestry, fishery, energy, industry, transport, waste management, water management, telecommunications, tourism, conservation of natural habitats, which set the framework for future development consent of projects listed in the Law on (projects) environmental assessment,

b) for P/Ps which determine the use of small areas at local level and minor modifications to plans and programmes, a need for SEA determines the authority responsible for P/P preparation, if identified that they were likely to have significant environmental effects.

Responsible authorities should determine whether plans or programmes are likely to have significant environmental effects, and hence whether SEA is required under the Law. Formal screening process can be devided in two groups. Mandatory application of full SEA of P/Ps from group (a), and by means of case-by-case examination of all P/Ps using criteria for determining the likely significance of the environmental effects of plans or programmes (Annex I of the Law).

The authority responsible for preparation of a particular plan or program makes a decision on the preparation of the SEA, taking into account a view of the environmental protection authority and other interested authorities and organizations. The content of document for decision-making, which represents some kind of preliminary SEA, should include the following:

- reasons for performing environmental assessment (based on criteria for impacts significance determination),
- scope of report,
- reasons for omitting particular environmental issues from SEA,
- basic content,
- methodology of assessment,
- method for involvement of interested parties and public in the consideration of SEA report, etc.

Article 7 of the Law takes into account hierarchical framework of planning, and stipulate that SEAs which are preparing for P/Ps at different levels of the hierarchy should be reciprocally adjusted, as well as with corresponding EIAs. It seems that this requirement has not been properly transposed from a requirement of EU Directive (Art. 4, para. 3), allowing conflicts between assessments at different hierarchical levels, and also allowing the duplication of the assessment at different levels of hierarchy. We found the examples of such cases while screening multiple plans within one authority, as well as in the cases of multiple plans under multiple authorities.

A typical problem with screening of multiple land use plans at different hierarchical level was ascertained in the area of Valjevo municipality. There are five land use plans currently being prepared: 1) Spatial plan of Valjevo municipality, 2) General urban plan of town Valjevo, 3) Detailed regulation plans of villages Petnica and Popucke, and 4) Spatial plan of water supply reservoir Rovni (see Figure 2). First four plans are within responsibility of local authority, while the fifth spatial plan is under responsibility of the Government of Serbia. Four approaches to the screening process of these land use plans have been considered:

- bureaucratic interpretation of the Law requiring mandatory application of SEA for each plan,
- preparation of two SEAs, taking into account levels of planning and decision- making,
- preparation of three SEAs, taking into account hierarchy of decision-making and the criteria for determination of the likely significance of effect, and
- case-by-case examination of all land use plans using criteria for determining the likely significance of the environmental effects.

The discussion on how to identify which of plans should be included/excluded has not been completely closed, due to the vague provisions of the SEA Law and weak horizontal and vertical coordination among responsible authorites.

In the first year of the SEA implementation in Serbia a number of additional procedural and methodological problems have been recognized to represent a barrier to effective application of SEA. These are: methods and techniques, relationships between public participation in SEA and public involvement in plan making, method of SEA report reviewing and access to the information. In this early stage of implementation of the SEA, principle methods in use can be described as an extension of the practice of a project's EIA. Based on the lessons learned from EIA practices, it is necessary to understand that SEA is a highly dynamic changing process that needs new different methods based on policy and planning evaluation techniques.

CONCLUSIONS

In Serbia, the integration of environmental policy in planning procedures is still largely being vewed as an appendage, in which

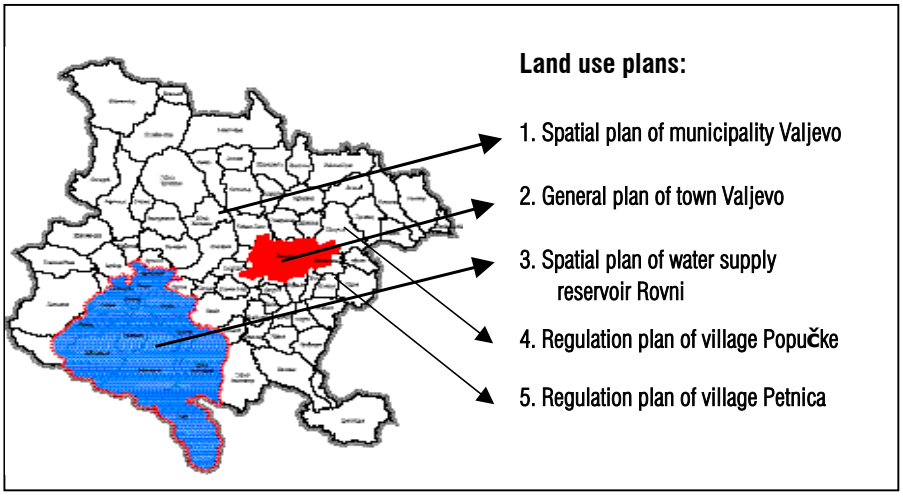


Figure 2 – Multiple land use plans in the area of municipality of Valjevo

remedial action is taken once economic priorities were implemented. Expirience from the past decade shows that implementation of EIA system in Sebia has not been effective as expected. New legislation on EIA and SEA are harmonized with coresponding EU Directives and provides a good basis for imprevement of the impact assesment practice in Serbia. The most difficult issues in the future will be on how SEA elements will be integrated in exsisting and new planning procedures.

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PROBABILITY MAPS AS A MEASURE OF RELIABILITY FOR INTERVISIBILITY ANALYSIS

Dušan Joksić, Branislav Bajat

Digital terrain models (DTMs) represent segments of spatial data bases related to presentation of terrain features and landforms. Square grid elevation models (DEMs) have emerged as the most widely used structure during the past decade because of their simplicity and simple computer implementation. They have become an important segment of Topographic Information Systems (TIS), storing natural and artificial landscape in forms of digital models. This kind of a data structure is especially suitable for morphometric terrain evaluation and analysis, which is very important in environmental and urban planning and Earth surface modeling applications.

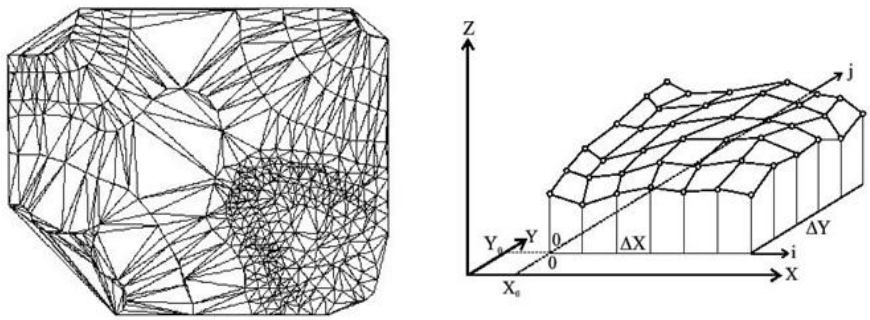
One of the most often used functionalities of Geographical information systems software packages is intervisibility or viewshed analysis of terrain. Intervisibility determination from analog topographic maps may be very exhausting, because of the large number of profiles that have to be extracted and compared. Terrain representation in form of the DEMs databases facilitates this task. This paper describes simple algorithm for terrain viewshed analysis by using DEMs database structures, taking into consideration the influence of uncertainties of such data to the results obtained thus far. The concept of probability maps is introduced as a mean for evaluation of results, and is presented as thematic display.

Key words: Digital elevation models, intervisibility analysis, probability maps.

INTRODUCTION

Gathering, maintenance and visualization of relief data are mostly used GIS (Geographical Information System) functions. This segment of GIS applications is well known as Digital Terrain Model (DTM). The DTM can be defined as 'any digital representation of the continuous variation of relief over the space' (Burrough (1986)). The process called visibility or intervisibility analysis recognizes that if you are located at a particular point on a topographic surface, there are portions of the terrain you can see (viewshed) and others you cannot see (DeMers (2000)). During the last decade this has become convenient tool for representing terrain surface, not only in GIS applications, but also in computer-assisted software for design. DTM bases are organized in different manners, like Triangular Irregular Networks (TIN) or in regular lattice (GRID). Term DEM is related to terrain height databases with regular grid structure or altitude matrix, and the term Digital Terrain Models (DTM) is mostly related to TIN structures in which the terrain surface is defined by the triangular vertices.

DEMs approach for data base structures is suitable for National Heights Data Bases which cover the whole country area as a part of the nation-wide spatial data bases available from the national mapping agencies. This kind of data bases are very useful in various application areas in GIS, like ecological studies, 3D urban mapping, environmental monitoring, landscape planning, geological analy-



a) TIN b) GRID

Figure 1. DTM and DEM data structures

sis, civil engineering, floodplain analysis, risk maps etc. They are also very suitable in complex analysis, especially in superimposing other kind of data, like satellite images or remotely sensing information. The new and improved methods of an analysis allow users to process even more complex application tasks with combinations of geometrical, topological and thematic aspects using hybrid data, i.e. raster data as well as vector data (Glemser *et al,* 2000).

DTM concept has started as a stand-alone application intended for different engineering tasks. Nowadays, it is a part of the spatial databases, which store the natural and artificial landscape in the form of digital models. DEM are compulsory component of one category of spatial information systems known as Topographic Information System (TIS) (Kraus (1995)).

Introduction of the GIS technology in spatial analysis has provided new capabilities in manipulating the spatial data, especially with data related to terrain features. One of the most often used GIS functionalities is viewshed or intervisibility analysis of terrain. A viewshed analysis can be defined as an analysis that "indicates not only what areas of a surface can be seen by one or more observers, but also, for any visible position, how many observers can see the position" (ArcView online help). Algorithms for this kind of spatial functionalities are developed both for GRID and TIN data base structures of DTMs. It is simple GIS function, where spatial units, which could be seen from one or more viewpoints, are coded as binary variable 1 or "true", in contrast to 0 or "false" for invisible parts. The collective distribution of all "true" spatial units is called the viewshed (Burrough&McDonell (2000)).

Viewshed terrain analysis has multipurpose practical usage. Applications include the location of fire towers, radar sites, radio, TV or telephone transmitters, path or route planning, navigation and orientation etc. Viewshed analysis is very suitable for evaluating urban environmental planning and development of new settlements, where it is used for discovering positions from which they can be seen, or at least for determination of visible routes for some locations, or for avoiding disturbance of natural landscape while designing huge constructions. This analysis is used also for setting up the best locations for watchtowers on forest terrain for the purposes of monitoring fire disasters or protecting endangered species. It is also useful in landscape architecture for defining less visible or totally uncovered space, or for planning in the least visible routes for displacement of army corps or for setting up radar systems for military purposes. In telecommunications, viewshed analysis is unavoidable part of project design for covering relay towers or for setting out locations for transceiver antennas, cellular telephone transmitters and receiving stations etc. Nowadays, this kind of spatial analysis is very popular tool in analyzing archaeological locations. Site location criteria are considered with respect to both the visibility from high viewshed locations, and the sheltering potential from wind, weather conditions, and other human and animal impacts, provided by low viewshed locations (Tripcevich (2002)).

Between June 1998 and December 1999, a very big survey via the World Wide Web (www) was been conducted among DEM users from various countries, organizations and industries. More than 200 participants from all over the world participated in this poll. One of the questions was related to purposes for which DMTs are used. Viewshed analysis is on the third place with 8 percent, after the hydrological analysis for catchment area delineation with 10.7%, and deriving drainage networks from DTMs with 8.6% (Wechsler (2000)).

ALGORITHMS FOR VISIBILITY COMPUTATIONS

Significant visibility structures for single viewpoint are the viewshed, which represents the position and a part of the terrain visible from given viewpoint, and the horizon, which expresses distal border line of the viewshed (De Floriani&Magillo (1999)). The simplest method to convey this analysis on a topographic map is to connect an observer location to each possible target in the coverage. Next step is to follow the ray from each target point back to the starting point, looking for the elevations that are higher. Those points would obscure the observers' view of what is behind it (Figure 2). Viewshed analysis from analog topographic maps may be very exhausting, because of the large number of profiles that have to be extracted and compared.

Viewshed analysis is a capability possessed by many GIS software packages with raster terrain data structures. Data output is usually in a raster format but some GIS software is capable to create vector output. Viewshed analysis performed in vector data format requires the use of a TIN data model. A wide range of procedures for viewshed analysis was developed for vector GIS software packages where terrain heights data are stored as TIN structures. One of those front-to-back approaches was developed and implemented by De Floriani, who used the fact that a spatial triangle could be hidden only by triangles in front of it. At each step, current horizon is maintained and used to determine visibility of new triangles (Figure 3).

The basic algorithm for generating a viewshed coverage from elevation data in raster structure is based on the assessment of the elevation difference of intermediate cells between the viewpoint and target point. The determination as to whether the target point can be seen from the viewpoint is accomplished by examining each of the intermediate pixels between the two cells, which allows determination of the 'line-of-sight'. If the land surface rises above the line-of-sight, the target is hidden. Otherwise, it is visible from the viewpoint.

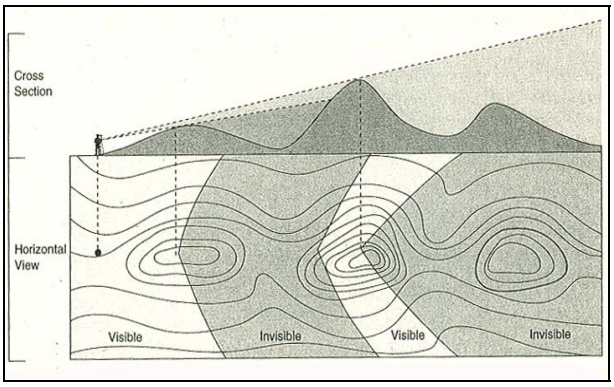


Figure 2. Viewshed analysis on a topographic map by ray tracing process (DeMers, 2000.)

The line-of-sight computation is repeated for all target pixels from a set of viewpoints, and the set of targets which are visible from the viewpoints from the viewshed coverage (fig.4) .

Practical algorithm for viweshed analysis consists of following queries (figure 5):

IF AD>AE

OR DF>EF

OR ∠ACB <∠AEF

OR ∠BAC <∠FAE

OR AC/BC >AE/FE

THEN **C** visible from point **A**

ELSE **C** invisible from point **A**

where:

A view point with given height offset (men's or construction's height),

B target point in horizontal plane with corresponding terrain height difference **BC** above point **A**,

F target point in horizontal plane with corresponding terrain height difference **FE** above point **A**.

Given formulas refer to terrain above the horizon of viewpoint. When viewed terrain is below the horizon, conditional statements would be opposite (instead of 'less' we will use 'more' and vice versa).

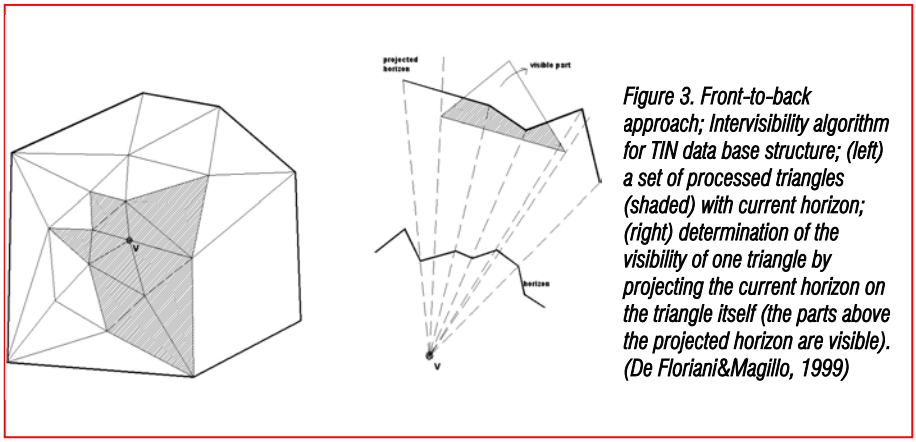


Figure 3. Front-to-back approach; Intervisibility algorithm for TIN data base structure; (left) a set of processed triangles (shaded) with current horizon; (right) determination of the visibility of one triangle by projecting the current horizon on the triangle itself (the parts above the projected horizon are visible). (De Floriani&Magillo, 1999)

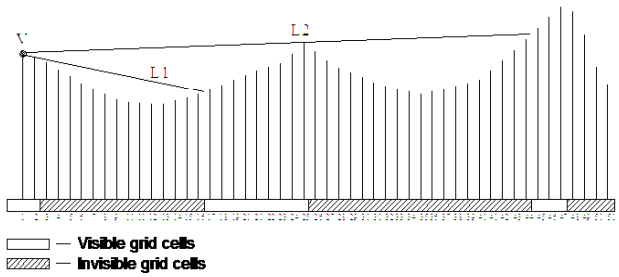


Figure 4. Line of sight approach for grid databases.

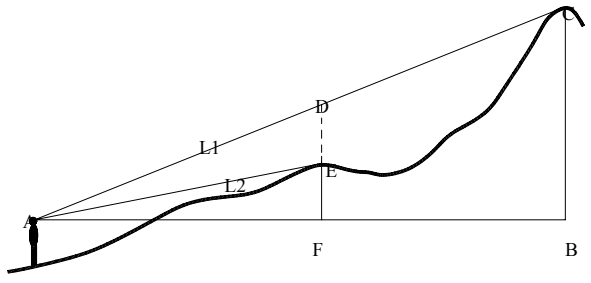


Figure 5. Viewshed analysis considering above given algorithm

PROBABILITY MAPS

The DEM is a model of the terrain surface, and like other models, this kind of data are subject to error. Terrain heights in DEM databases are considered as point features in which heights components are stored as attributes. This concept is well known as 2.5 GIS data model. Attribute accuracy is the main element of quality of such spatial databases. Accuracy can be defined as closeness of agreement between the test result and the accepted reference or 'true' value, where reference values are data sources of higher accuracy. However, a true value or location is a luxury not often available in spatial data.

In the case of spatial data it refers to data of larger scale and resolution or usage of instrument of higher accuracy or more recent measurements. All those imply that definition of accuracy is relative and for that reason term accuracy is substituted by uncertainty. Many words with similar connotation are used to express term uncertainty, like reliability, confidence, accuracy, error etc. This term is especially suitable for reporting the assertiveness of variables where true values are unknown. Under these circumstances it is not feasible to calculate exactly the error of the appraisal. A useful step in assessing the uncertainty is to consider the factors by which the error is influenced (Isaaks&Srivastava (1989)).

Two DEM-related uncertainty categories are commonly recognized. The primary is data model-based uncertainty, resulting from differences between the form of data model and actual elevation surface. The second is data-based uncertainty, referring to differences between the elevation of location specified in the data set and actual elevation at that location (Shortridge (2001)).

DEM altitudes are given as interval data, and root mean square error (RMSE) or standard deviation could be used as an uncertainty metrics. The RMSE calculated from residuals between models heights and 'ground truth' points is commonly used measure of the accuracy for the DEMs products (Caruso (1987)). Another powerful measure is the standard deviation of residuals, obtained from discrepancies between model heights and terrain heights at the particular locations.

$$\sigma_z = \sqrt{\frac{\sum_{i=1}^{n}\left(d_i - \bar{d}\right)^2}{n-1}} \quad , \quad \bar{d} = \frac{\sum d_i}{n} \qquad (1)$$

where:

d_i- residual between height in DEM and 'true' height $d_i = z_{DEM} - z_t$

n- number of control points.

An accuracy evaluation often uses field survey data, which is based on the Global Positioning System (GPS) because of its high accuracy.

Performing control measurements is a standard procedure for evaluating the quality of DEMs products. DTM vendors often provide this kind of data associated with DTM products as meta data. DEMs users are able to perform control measurements if they are not acquainted with lineage of data. Locations of the control points have to be randomly chosen (Li (1991)).

Monte Carlo simulation approach is very often used for studying the propagation of DEM errors. The main idea of this approach is to use conventional statistical tools for evaluating error propagation by producing a number of realizations of DEMs for same terrain area. Each realization is obtained by adding "error fields" to initial DEM. An "error field" is surface of random values with a zero mean and standard deviation equivalent to the supposed range of error. Physically "error field" represents a matrix of values produced by random generator algorithm with same dimensions (rows and columns) as initial DEM. Errors in spatial data are spatially autocorrelated. The error field could also be modeled with various correlation functions if spatial structure of errors is known. Spatial structure of the error may be determined by spatial autocorrelation measures or variograms of the error fields.

For each realization of DEM, we can achieve thematic display of viewshed map, which is regarded as a distribution of possible realization within which the true values lie. This approach is known as "stochastic imaging", or the modeling of spatial uncertainty through alternative, equiprobable, numerical representations (maps) of spatially distributed phenomena (Journel (1996)). Stochastic simulations supply a series of random likely maps using stochastic modeling methods from mathematical statistics. This method does not guarantee that "real" map is generated, but it provides a bound within which we can affirm that the true map lies.

The probability of any DEMs grid cell being visible from viewpoint is given by (Fisher (1999)):

$$p\left(X_{ij}\right) = \frac{\sum_{k=1}^{n} x_{ijk}}{n} \qquad (2)$$

where,

$p\left(X_{ij}\right)$ is the probability of a cell at row i and column j in the grid raster DEM being visible;

x_{ijk} is the value at the grid cell of the binary-coded viewshed in realization k (1 for "true" and 0 for "false"), such that k takes values 1 to n (the number of simulations).

The image produced in such a way consists of the pixels with $p\left(X_{ij}\right)$ values, and it is known as probability map. It is used as a measure of "attribute" accuracy. Namely, for all thematic displays of some phenomena where quantitative parameters are used, probability map is the best indicator for reliability of such analysis.

CASE STUDY AREA

DEM was produced by digitizing contour layers from two adjacent sheets of the topographic maps of scale 1:5000, with contour interval of 5 m, with total area of 13.5 square kilometers for the research purpose. Test location is the resort area of Zlatibor in southwestern Serbia with minimum height of 850 m and maximum height of 1174 m. This area is hilly plateau, with the exception of the west and northwest part with greater terrain slopes.

Digitized polylines with height attributes were broken into vertices and by using the Douglas-Peucker algorithm for polyline simplification to 51847 points reduced such big amount of obtained points. A DEM was produced in two steps: An initial TIN was produced using a Delaunay triangulation, being subsequently converted into regular grid with 10 m resolution (350 rows by 400 columns).

View point was settled at the southwest part of the test area "Zlatibor" , with Y = 7 394 967 m, X = 4 842 665 m coordinates in the national grid. Heights of vegetation and objects were not taken into account in this analysis.

Thematic display of viewshed for initial DEM is given at figure 7. The number of visible grid cells is 30.7% of the total test area, or 414.8 hectares.

A GPS survey of control points has been carried out. Calculated σ_z for data set was approximately 1.25 m, and the obtained result is in accordance with an expected accuracy of the cartographic source data used for DEM production (Merchant (1987)).

Error fields simulations were carried out with estimated σ_z, under correlated conditions. 25 simulated DEMs were used to obtain probability map. For each simulated DEM, viewshed map was calculated, and accordingly

Figure 6. Panorama of the case study area "Zlatibor

the procedure given above, probability for each map unit (grid cell) was produced. Probabilities of viewshed are given in the map legend (figure 8).

Contour of viewshed probability area is very similar with outline of the viewshed area acquired with initial DEM. Different levels of probabilities for viewshed lie within that contour.

CONCLUSION

In the GIS environment, viewshed analysis is recognized as a helpful system component, contributing to interpretation of spatially related phenomena and complex data analysis that take the GIS a step beyond two-dimensional polygonal overlay analyses. Most applications of viewshed analysis are based only on topographic surfaces, but in some cases the topographic surface has forest covers with heights which differ to relief elevations. To get plausible results, it would be better to use Digital Surface Model (DSM). While DTM or DEM describe the earth surface in the sense of the "bald earth" without human artifacts such as buildings or bridges and without vegetation, DSMs include points on buildings and vegetation as well as terrain points.

Very often, outputs provided by GIS functions are assumed as exact results. Like other spatial data bases, DTM data bases can be affected by errors. It is very important to examine the effect that they may have on data analysis and modeling of spatial data. DTM data are often used in analysis without quantifying the effects of these errors. Probability maps based on Monte Carlo simulation techniques are very suitable for evaluating the impact of DEM error on viewshed analysis. These kinds of maps can be used as an accompanying material with exact thematic displays for any kind of displays which are the results of the GIS analyses, serving as a measure of reliability.

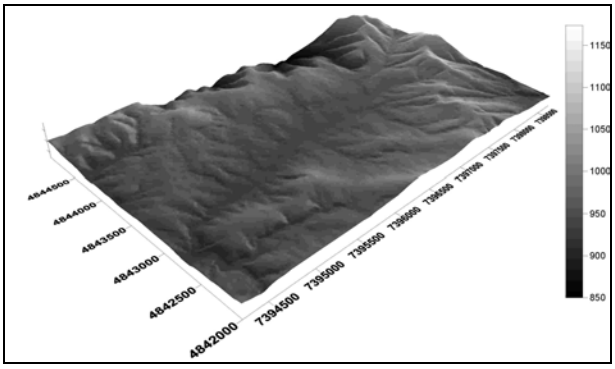


Figure 6. Panorama of the case study area "Zlatibor"

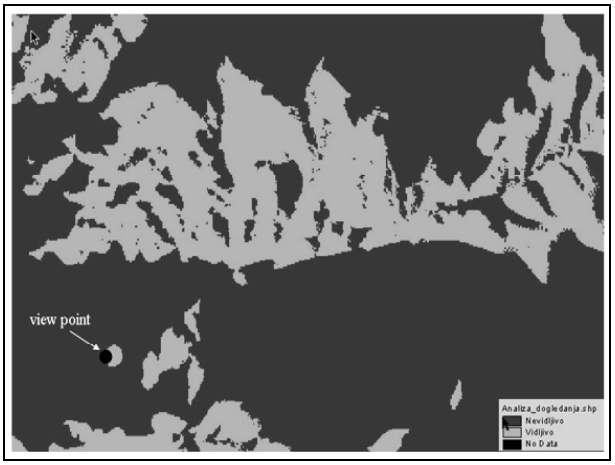


Table 1. - Government Openi

GOVERNMENT OPENNESS A TRANSPARENCY
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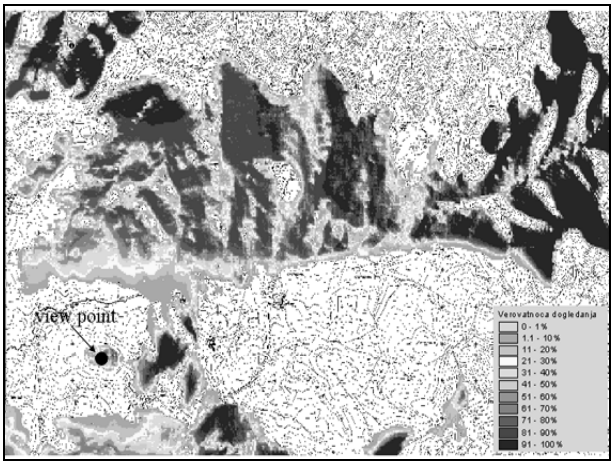

Figure 8. Probability map of viewshed for test area "Zlatibor"

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INTELLIGENT BUILDINGS IN CONTEXT OF ENERGY RATIONALIZATION

Mila Pucar, Milan Pajević, Marina Nenković

This paper overviews state of the art, the development activities, and futuristic vision on 'smart' and 'intelligent' buildings' construction in context of measures which improve their energy efficiency. The technologies for programming, regulation and automation of energy consumption in buildings, which characterize the current form of 'smart' buildings, together with the implementation of 'intelligent' facades, are already pointing to some significant results which may be accomplished in relation to energy efficiency optimisation of buildings without compromising their greater flexibility and comfort in use. One of the major preconditions for further development of these systems is the integration of design processes which refer to the core of a building and to its installation utilities.

Key words: smart buildings, intelligent facades, green buildings, energy efficiency, energy optimisation.

INTRODUCTION

What do we consider by the term of 'intelligent buildings'? Having that in the anglosaxon literature sources we may also find an expression like 'smart buildings', we can conclude that there is a general confusion stemming from insufficiently precise definitions of these two terms and use of computer jargon in this field. 'Smart' buildings are characterized by complex installations, ranging from air conditioning as a minimum requirement, up to full automation of the entire system of building operation as a maximum condition.

In this paper, we consider 'smart' building to be a construction which is equipped for performance of different management, programming and regulation functions, e.g. programming and regulation of cooling and air conditioning systems; charging for fuel consumption and telephone bills in multi-family buildings; or data collection and analysis for a building and its installations within a long period of time.

'Intelligent building' is defined as the construction with a shell which, besides having a high level of equipment and automation of installations, also consists of materials and components with features that can adjust according to the inside and outside climatic conditions aiming to produce optimal conditions for energy efficient and aesthetically pleasing building use.

Intelligent glass facades

An important factor for functioning of either 'smart' or 'intelligent' buildings is their high-quality maintenance. This also presumes a highly-skilled qualified people for performing the operations of maintenance, otherwise some serious problems that require expensive solutions may well be expected to occur. Regarding all the difficulties that may arise because of the lack of maintenance or organized qualified services in the existing buildings with conventional installations, it is obvious that before any attempt to introduce 'smart' or 'intelligent' edifices to our design and building construction professional practice, it is essential to resolve in the first place some organizational and technical issues of the entire maintenance.

PRESENT WAYS FOR UTILIZING THE INTELLIGENT AND SMART BUILDINGS

Smart buildings

For the time being, the equipment of 'smart buildings' is in the most cases levelled down to systems of management, which serve as the centre for programming and regulation of all conventional building installations, i.e. fire-proof equipment, safety measures, and occasionally, the elevators. Besides all mentioned, a good project for this type of building should also allow for integration with other systems for transferring information in the building, e.g. telecommunications and computer terminals.

A starting point of all measures which aim to achieve increased energy efficiency is the notion that energy should be measured as any other consumer's good. This, however, presumes that something can be managed only if it can be measured and thus quantified and if its consumption and performances can be followed by an adequate monitoring system.

If the first important phase of measuring and managing the energy consumption is represented by setting up of a measuring device, then the next phase will consist of managing the energy by application of programming and regulation, followed by maintenance of optimal humidity and temperature conditions in order to prevent uncontrolled energy consumption.

- *Regulation* can be applied to all energy spenders in buildings (e.g. lighting, heating, ventilation systems, etc.). Regulation of heating is done by thermo-elements which can set up various modes of facade heating regimes, i.e. per surface, per usage, per room, etc. A thermostatic valve is recommended for use in buildings with communal heating system. This also applies to regulation of lighting and ventilation in sport centres.

  In order to become efficient, regulation should be decentralized to the largest possible extent. Regulatory appliances are economically most effective in buildings and in industrial processes. In schools and administrative buildings, the investment in regulation of heating system proves to be mostly efficient since it can be usually redeemed within less than a year.
- *Programming* can be applied to any form of energy consumption in buildings, e.g. lighting, ventilation, engines (pumps, compressors), heating and air-conditioning. It rationally adjusts the power in order to satisfy the energy needs, which is mostly efficient in buildings that are not in constant use. In multi-family residential buildings, the programming and energy measurement should proceed any other action. Better programming requires a simple, relatively centralized automation together with a competent and regular control.

  Programmed heating can bring to savings of 30-50% when applied in schools and offices. Similar kind of savings occur with programmed lighting and ventilation. When programming device is installed on heaters in individual heating systems, it can be expected to achieve 15-25% energy savings in average.
- When process power of a generator is accurately calibrated, then some significant savings may well be accomplished. *Electronic plants with adjustable speed* have considerable potential for energy savings, but also they have a highly positive impact on electric engines regarding their efficiency and longevity. This sort of equipment is applicable on any type of engine.

  Estimated energy savings that can be achieved by incorporation of the above mentioned devices are: 30-50% when used in ventilators or in pumps for boiler supply; 20-25% when used in compressors; 20-35% when used in systems for freezing; and 20% when used for thermal pumps and air-conditioners. It is assumed that under free-market economy conditions, an additional investment in such equipment would pay off in less than 1.5 years.

Intelligent façade - Warema Electronic Germany

Intelligent facades

One of the mostly spread types of contemporary intelligent buildings are the multiple glazing facades with louvers and/or constructively or aesthetically shaped shading details. In most number of cases, their 'intelligence' depends on mechanical manipulation of louvers, and only rarely it depends on their control by the automatic systems.

This level of intelligence is in function of a good project, i.e. it provides an integrated participation of all professions that are part of the project team. A right combination of adequate levels for heat and light transmission on the one hand, and level of shade on the other, will notably influence the capacity of installation devices as well as that one of the heating and lighting equipment.

Present versions of this system are using the air canal of the in between space of glazed windows/ glazing systems for removing solar gains in summertime and for reducing the effect of cold breeze in wintertime, or they use reversible louvers that reflect solar gains in summertime and absorb thermal losses in winter.

Wind screens usually incorporate the transparent, thin covers or coatings which absorb the light, are applicable on single or double glazing, and which have such light transmission characteristics that do not make them so much different from their corresponding transparent glazing while offering a wide scope of thermal characteristics depending on the type of screen. Once chosen, such characteristics cannot be altered.

Materials which are potentially best for a controlled use of thermal and illumination features of glazing are thermochromatic, photochromatic, and electrochromatic. Thermochromatic materials are activated by thermal energy; photochromatic by photons, and electrochromatic by the chemical reactions which have been electrically induced.

From the above mentioned 'active types of glazing', the *electrochromatic* one is with best potentials. Depending on voltage level, voltage induction affects the colour or transparency of material (redox materials, electroactive polymers, transition metal oxides, etc.), and when electricity switches off, the film will retain its changed condition until the next voltage exposure.

Conditional on changes of the sun radiation, *photochromatic glazing* will change the transmission of light, reducing both illumination and direct transmission of sun radiation, while enhancing the isolation as well. Silver halogens, which are applied to achieve better effects, will influence the glass ability to absorb the heat, which, unless single glazing is applied, can then be re-emitted in the surroundings. Usual application of this type of glazing is for spectacles that use thin glass.

It is not yet possible to predict the time-scale to achieve economical acceptability of electro- and photochromatic glazing production for glass panels in architecture which require different thickness and sizes of these products. Appropriate use of this glazing would necessitate adequate monitoring and measurement of the indoor and outdoor conditions in order to enable transmission characteristics to adjust in a way that would create optimal inner environment with efficient energy use.

Also, there exist *thermochromatic materials* which can be used for glazing to make it opaque as the temperature raises. In energy terms, the lack of this material is manifested by heat absorption in glass which occurs during thermochromatic processes.

When facade elements are in concern, we should also mention the famous *Trombe Walls* for accumulation of solar heat, in which glass plays a significant role in redressing the climatic conditions.

Also, there are some already demonstrated variations on this theme. One of them is *prismatic wall* which operates similarly in a way as the one of rotating marketing panels, where a number of vertical columns with equilateral triangle profile rotates in order to produce three different pictures – compositions. The application of this principle in building construction is based on a fact that exposed sides of columns can vary from absolutely reflective to absolutely absorbing ones, where each stripe contains the material for heat accumulation. We will achieve absolutely homogeneous planes if columns are touching each other. Nevertheless, they can be left semi-opened in order to let some light passing through.

Town Vaastu Shastra, India

The technology of 'intelligent facades' already exists on a micro-level and its further development can be expected. In this respect, the most promising fields are those which are based on technological development of glass and glazing technologies, which allow development of large production capacities and introduction of reasonable prices.

Many of the aforementioned solutions have been criticised as impractical, too expensive or suitable only for special buildings. There is some truth to this but also we have to acknowledge the fact that these principles and

Zoned Heating and Cooling in Florida

many solutions of a kind have been applied in a growing number of buildings. A number of reasons can explain this, e.g. constant development of design process; the need for more efficient buildings; incorporation of new (tested) materials and technologies which appear on the market; and even greater consumer's and investor's demands regarding the building performances.

RESEARCH DEVELOPMENT WORK

In the present phase of development projects and with anticipation of redesigned conditions for their implementation, we have to create conditions for efficient application of new generation of materials and technologies. In the first place, this requires a better coordination between designers and the integration of designing processes. The use of management technologies, regulation and automation are already present in practice, and despite being in many respects in the initial phase, the development of software, the number of companies that gets involved in this field, and money which is to be invested in further development of alternative strategies and technologies, are in constant increase.

Growing numbers of major European research centres, which are specialised in energy efficiency issues are also directing their attention to this field. In this context, most interesting are the works of French "COSTIC" (Comite Scientifique et Tecnique des Industrie Climatique) and CSTB (Centre Scientifique et Technique des Batiment), as well as those of Italian ENEA (Ente per le nuove tecnologie l'energia e l'ambiente).

Apart from an impressive research in the spheres of new and renewable energy sources, rationalisation of energy production processes and environmental protection, which have been conducted in large number of demonstration plants, buildings or settlements, the research field also relates to new systems of residential building automation. These projects aim to improve design of equipment for construction installations, to test compatibility between certain devices and systems while they are in operation, and to enable education of personnel in charge of installation and maintenance of equipment.

Since 'intelligent' and 'smart' houses involve technologies from different sectors of industry (e.g. construction, electrical engineering, electronics, thermal energy, telecommunications, safety, audio-visual devices etc.), researchers and designers have to become increasingly aware of the need to address this area in a

coherent and multidisciplinary way, with application of a system approach.

FUTURISTIC APPROACH TO INTELLIGENT BUILDINGS

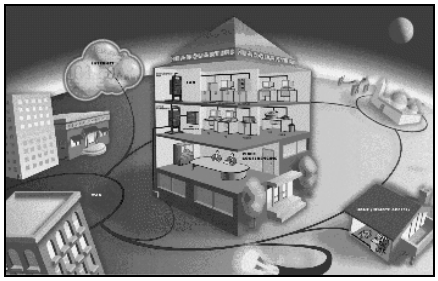
Future architecture will be influenced by a number of factors, e.g. technology; demographic changes; economics; changes in global climate; preservation of resources and environmental protection; and most certainly, by the development and integration of planning and designing processes.

After the periods of 'closed' and 'open' systems, ever intensive use of automation in processes of production of the construction elements will bring to rise of new building technologies which allow 'made-to-measure prefabrication' and even greater freedom of expression through non-linear shapes, domes and 'bubbles'.

New technologies, which will produce such forms by using the multi-layer and sandwich materials, will enable that even those details wouldn't become more expensive than the classical ones. New universal panels will also be applied, and they would be suitable for use at floors, walls or roofs. There is a wide spectrum of materials which will serve that purpose, e.g. wood, steel, aluminium, ferroconcrete, and plastic materials of high performances.

Computer aided design (CAD) advanced to such an extent so it becomes much easier do design on screen than on a sheet of paper. Though producers would provide standardization of a majority of details for their prefabricated products and materials, building details are also to be designed to fit special requirements.

Apart from being of decorative appearance, buildings of the future will also be intelligent. Despite the initial confinement to structuring of intelligent facades, programming and automatic regulation of installations, that process would continue to progress. Some constructions will have installed sensors for detecting voltage, distortion, subsidence, corrosion, and other problems related to major construction elements. Micro-environmental sensors will be installed for following of: temperature and air quality (including the pollution), levels of energy consumption in different parts of buildings, as well as possible infiltration of air or moist through roofs and walls. All these information will be stored in central processor which will control the building's 'health'.



Project From Data Processing Solutions

As the result of possibility to build in non-linear forms, after the 'Art nouveaux' movement and biological architecture, we may expect future renaissance of biomorphism and 'Nouveaux-Art-Nouveaux'. Planning and design will be based on 'sustainable development' principles and protection of heritage.

Solar House, USA

CONCLUSIONS

Broader incorporation of 'smart' and 'intelligent' buildings in practice requires fulfilment of a number of organisational, economic and technological conditions. The level of satisfaction of building users' growing needs will greatly depend on their economic power, hence in lack of free-market criteria, many solutions which require additional investment will need to wait for better times or higher living standards.

In order to demonstrate advantages of such buildings, it is necessary to organise a coordinated development work between producers and users/investors, with aim to produce systems of intelligent buildings according to specifications which represent needs and potentials of users. Further development should also incorporate demonstrating potentials for control and regulating systems in buildings, which can be of particular interest for certain social groups, e.g. senior people associations, people with disability, etc.

In parallel with all the aforementioned measures, it is necessary to continually work on education of designers as well as to pursue with practice of integral type of design, and equally, to implement the actions which would introduce broad public to the concept of intelligent buildings.

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CIT IN DEVELOPING COUNTRIES: THE CASE OF TRINIDAD AND TOBAGO

Milica Bajić Brković

Trinidad and Tobago is faced with the challenge of developing strategies to integrate successfully in the new knowledge economy. Many governmental actions towards "wiring" the nation are currently taking place. Creation of the "intelligent nation" is among country's national development objectives. Vis-à-vis plans yet to be designed and implemented over the next ten years, there is a reality of the www option that has gained a momentum, and is already playing an important role in Trinidad and Tobago. While during the first years the www has been accepted as a medium for communicating and sharing information, today it has moved onto the next generation transforming into the development supporting tool.

The experience of Trinidad and Tobago in using the CIT-based alternative is the focus of this paper. It explores the state of the art in the field, and discusses the way the alternative has been utilized so far in the country's development and management practice. It also identifies the potentials for further development, and suggests a number of proposals for future strategies and actions.

Keywords: CIT, www, Internet, development, management, developing countries, Trinidad and Tobago

INTRODUCTION

Many countries place the Communication and Information Technologies (CIT) high on their development agenda, and rank them amongst the key determinants of their future development. Although CIT taken alone is not a determinator of future development, nor it guides and shape our cities and regions independently of other forces - political, social, economic and cultural, its influence on development is incontestable and increasing.

The World Wide Web (www), and more specifically the Internet, has been introduced on a large scale less than a decade ago, however, in many countries grew rapidly not only in a new communication channel, but into a parallel economic and social domain. As such, it constitutes part of the reality that can no longer be overlooked. The www space has become a place where part of the development and management functions today take place. Currently, there are many e-services in operation, ranging from simple tools for disseminating information and facilitating access and communication, to the most complex forms created and maintained to improve the public domain, and in particular, development and management of cities and regions. Public services and resources have thus become closer to their citizens, and different actors participating in public domain now have an arena for developing dialogue, co-operation and exchange.

Introducing the www based tools into the development and management processes and procedures, does not necessarily lead towards new paradigms or development models. Rather, they are aimed at providing supplementary means to facilitate the existing ones, and to support and comply within the premise of their social/economic role, and its implications. The option has been admired particularly for the role it plays in supporting businesses, locally and internationally, but as a new economic resource in general. As for its social part, the contribution towards enhancing openness and transparency of local governance, as well as development of citizenship and urban democracy, have been amongst those mostly praised.

The experience of Trinidad and Tobago in the field is discussed in this paper. The paper focuses on the way the www based alternative has been utilized so far in the country's development and management practice. It also identifies the potentials for further development, and suggests a number of proposals for future strategies and actions.

TRINIDAD AND TOBAGO ON THE WAY TO THE WIRED WORLD

It was only in 1995 that the World Wide Web was introduced to Trinidad and Tobago. While during the first years it has been accepted as a medium for communicating and sharing information, today it has moved onto the next generation transforming into the development supporting tool.

Today, Trinidad and Tobago is faced with the challenge of developing strategies to integrate successfully in the new knowledge economy. Many governmental actions towards "wiring" the nation are taking place at the current time. Creation of the "intelligent nation" is among country's national development objectives, and different institutions and ministries have been taking steps towards incorporating the use of CIT in their daily operations. The Ministry of Information and Communications Technology has thus been established, and the Government has launched the "Vision 2020", a strategic development document, within which CIT is placed among the top priorities for the next twenty years. The Government has a mandate to take the technology to its fullest potential in order to (a) "catch up" with the global situation, (b) improve its efficiency in operations, and (c) enhance the way of life and development of the nation's citizens.

Important steps which have been taken by government include the creation of an e-Government Unit, and the National Electronic Commerce Secretariat (NeCS). The e-Government Unit is responsible for the development and implementation of a national policy on e-government, and will also eventually supervise the Government Virtual Network which is to be part of the portfolio of the National Information System Centre (NISC). The National Electronic Commerce Secretariat is the official government machinery for the implementation of the e-commerce policy of Trinidad and Tobago. The Secretariat is a central point of contact and coordination with respect to queries and requests for information on e-commerce related activities in Trinidad and Tobago and within the hemisphere and will play an integral part in moving Trinidad and Tobago towards the global digital economy.

The development strategy emphasizes, inter alia, the importance of developing an appropriate strategy for integrating into the world wide technologically based economy, and providing the infra and supra structure for supporting it. Here are some fractions from the document.

Towards the Globally Competitive and Technologically- Driven Economy

Government intends to use the information technology revolution as a tool for human development and is therefore committed to transforming Trinidad and Tobago into a globally competitive, technology-driven society. In this regard, information technology will be utilized to nurture and develop the country's human resource capability. Thus the objective is to enhance understanding of the role of technology and adopt best practices to increase the knowledge, develop and leverage competencies and create jobs with the ultimate aim of improving the socio-economic well being of all of the people in Trinidad and Tobago.

In order to exploit technology as a business and social facilitator, Government will continue to invest, build and facilitate the development of information technologies, telecommunications and Internet infrastructures in Trinidad and Tobago. The aim is to make Trinidad and Tobago an intelligent nation, where technology is pervasive in use and is incorporated into every aspect of the improvement of society – at work, at home and at play.

Key strategies include: the establishment of a Technology Park, the liberalization of the telecommunications sector, the expansion of Internet connectivity and implementation of the e-Commerce Action Plan. Additionally, to facilitate and support the thrust in technology, Government will continue to invest in the upgrade of physical infrastructure.

Over the medium term, a National Information and Communications Strategy will also be formulated, with the main focus on:

(1) Enhancing the infrastructure for increasing competitiveness by focusing on areas such as telecommunications, industry/academic collaboration in research and development, venture capital, long-term education policy and intellectual property protection.

(2) Creating and strengthening the market for Information Technology (IT) services through Government procurement procedures and encouragement of strategic alliances between local and foreign firms involved in information technology.

(3) Enhancing general capabilities, both in individuals through skills training as well as management development and in industry through the formation of business associations and co-operation among competitors, to deal with mutual issues and emerging trends in the IT industries.

(4) Establishment of the Trinidad and Tobago Telecommunications Authority (TTTEL) is an indispensable element in the development of the information, communications and technology sector. Over the medium term, the Telecommunications Act 2001 and its associated regulations will be implemented. To facilitate in this activity, Government will access the Multilateral investment Fund (MIF) of the Inter-American Development Bank (IDB) for the provision of technical assistance in the form of legal, economic and engineering consultancies to strengthen policy formulation in implementation and regulatory management.

(5) Government through the Freedom of Information Act (FOIA) 1999, will promote transparency and accountability in the conduct of Government business and encourage meaningful public participation in the formulation of national policy. The FOIA Monitoring Unit will facilitate the implementation of the Act in all public authorities through the delivery of sensitization programmes and development of an activity database to monitor the work of the public authorities and their designated officers.

Government will also transform the National Information Systems Centre (NISC) from its current data processing and service function to a policy and coordinating agency for information technology in the public service. Consideration will be given to restructuring NISC into a statutory body or corporate entity in order to more effectively serve its clients and contribute to the wider development of the information economy. Individual ministries and departments will eventually be required to establish their own IT Units to cater to specific needs within the context of a general policy framework administered by the Central IT Organization.

Development of E-Commerce

Government can hardly be expected to be the main engine of growth in the knowledge-based economy. Policy and legislation are critical to

the process, however the private sector has already established itself as a major share-holder in cyber space and its influence is steadily growing.

In respect to that, the National Electronic Commerce Secretariat has developed a five-year action plan to bring e-commerce to the forefront of local and international business development. E-commerce holds great potential and opportunities for businesses. Besides the access to new and bigger markets, e-commerce can help reduce costs and increase turnaround times by streamlining and integrating processes along the entire business value chain. Further, the emergence of Trinidad and Tobago as a regional e-commerce hub will help to create and sustain an e-commerce services sector. This sector will provide employment opportunities for business strategists, creative designers, system integrators, network operators and other e-commerce intermediaries.

The Electronic Commerce Action Plan was launched to drive the pervasive use of electronic commerce in Trinidad and Tobago, and to establish Trinidad and Tobago as the regional e-commerce hub. This launch marked the start of a campaign to bring electronic commerce to mainstream businesses, the public and Government and to attract international e-commerce activities to Trinidad and Tobago.

The National e-Commerce Action Plan has five main thrusts:

1. Strengthening the e-commerce infrastructure;
2. Increasing participation in e-commerce;
3. Clarify marketplace rules;
4. Building user confidence in e-commerce; and
5. Jump-starting the e-economy – sectoral initiatives .

Each of these five areas will be implemented through specific programmes and projects over the period 2001 to 2005.

Beginning 2001, the priority of the e-commerce initiative has been to implement the following programmes and projects:

1. The establishment of community and home-based Internet access centres in remote locations throughout the country;
2. The development of Enterprise TT: an e-commerce business development scheme for micro, small and medium-sized enterprises;
3. The establishment of an e-commerce training unit for training the general public in e-commerce and the use of the Internet;
4. The development of an on-line guide to doing e-business;
5. The introduction of a legislative framework and other mechanisms that cater for the protection of consumer rights, protection of intellectual property rights and the criminalization of computer misuse and computer fraud;
6. The establishment of a country registry;
7. The development of e-government towards a better trained, equipped and transformed public service sector that offers efficient and expeditious on-line services to citizens of Trinidad and Tobago; and
8. The implementation of a mechanism that would allow for the establishment of an authentication and certification authority and the promotion of electronic payment systems.

WWW BASED ALTERNATIVE IN DEVELOPMENT/MANAGEMENT

The CIT has potentials for improving the quality of public/economic domain by providing different e-services for managing cities and running economy. The e-services are amongst the most rapidly growing development sectors of today, and remarkable results in that field have been achieved in many countries worldwide. In more developed countries there are hundreds of thousands of operating modules with different tools in almost every city/region. Some countries, like Italy or Singapore are gradually replacing a traditional model of the face-to-face office work by this alternative.

Among the range of different tools there are those that have been around since the advent of the www. Others have gone mainstream over the last few years. All of them can be implemented as part of an e-management strategy. The most simple is a website typically used as the foundation for delivering services, and the place where most citizens initially go to explore the types of services that are offered, while the more sophisticated include the Civic Web Network - CWN (Bajic Brkovic, 1999, 2002), Online Portals (Steins, 2002), or Web Portals or Gateway (Creech, et.al, 2001). All of them may include different tools and technologies, and with respect to that their role may change as well, ranging from a simple "storage and communication space" to a democratic public realm or business arena.

The www based alternative generates positive effects to all parties involved, from the individual to the societal level. The benefits could be summarized as follows:

Individual/Citizens

1. Offers alternatives
2. Enhances public participation in the democratic process
3. Enhances social and community life
4. Provides instruments for carrying out activities
5. Provides access to information and facilities
6. Develops new skills and creative thought
7. Supports cosmopolitanism and trans-localism
8. Opening up an opportunity to integrate the less privileged or otherwise marginalized groups

Business/Corporate Sector

1. Supports business and economy
2. Improve service delivery business-client and business-business
3. Creates opportunities to improve delivery at lower costs
4. Enables greater efficiency in job performance
5. May enhance or improve employment practices
6. Opens the door to new business opportunities
7. Provides innovative and new professional tools
8. Provides opportunities to integrate into regional/international business/economic world

Public Sector

1. Creates opportunities for governments to improve service delivery at lower costs
2. Provides potentials to improve quality of the local urban management
3. Supports efficiency of local governments and improving quality of the decision-making processes
4. Improves quality of communication between local authorities and their citizens, and adding new opportunities for participation expansion in the local community affairs
5. Provides a platform for communication and cooperation between different local authority's bodies and departments
6. Enables citizens to communicate with their governments in an easier and more efficient way
7. Provides citizens with easier access to different information, government departments and bodies, etc.
8. Supports democratization and public involvement
9. Supports cosmopolitanism and translocalism and is opening up un opportunity to integrate into regional/international wider framework

THE WWW BASED TOOLS CURRENTLY IN USE IN TRINIDAD AND TOBAGO

Vis-à-vis the strategy yet to be implemented over the next ten years, there is a reality of the www option that has gained a momentum, and already playing an important role in Trinidad and Tobago.

The web sites, as the most simple tool for delivering the www services, are the prevailing instrument currently in use. An ongoing study on conducting the businesses and public affairs via the web option (Bajic Brkovic, 2003) has revealed that as for the country of this size, there are an enormous number of sites currently operating. This is due partly to the fact that Trinidad and Tobago has the most vibrant economy in the English-speaking Caribbean, and is the fastest growing country in the region. On the other hand, it could be also attributed to the ongoing endeavor of integrating the country into the global processes, and catching up for benefits of the knowledge-based society.

Roughly, the operating sites could be grouped into the following categories:

1. Industry and manufacturing
2. Government
3. Non-governmental organizations
4. Education

In assessing the role they play and impact that have on development/management practice in the country, the following features are relevant:

1. Their mission and contents;
2. Population group they address, and user group they target as their primary client;
3. Type of communication built in: one/two way; real/non real time communication; interactive communication;
4. Provisions for direct involvement and participation of relevant actors/public/stakeholders;
5. Links: local/regional/international;
6. Relevance for improving service delivery;
7. Potentials for enhancing further development of services;
8. Provisions/potentials for manageable and transparent management;

Industry and manufacturing

The overwhelming majority of the operating sites in Trinidad and Tobago are from the industry and manufacturing sector. This speaks for a need to explore and use all options available in captivating economic opportunities, with a view to strengthening the country's development. The companies that have chosen to explore and utilize the wired option range from large multinationals to the very small local operating enterprises.

The majority of these presentations are made for the self-promotion purposes, and are constructed and designed to support the companies' self image, as well as for marketing purposes. Only a very small number are at a stage of using the web option as a real communication tool, or as a platform for conducting daily operations.

The communication mode is most often the one-way, and while a small number of them do have an established two-way communication channel, they choose a non-real time operational mode (e-mail, posting messages, comments etc.).

Business-to-public option is as a rule in use, however, a business-to-business option appears to be a growing trend, especially in case of big companies. Good examples are the Petroleum Company of Trinidad and Tobago Limited (Petrotin): *http//: www.petrotin.com*, Atlantic LNG Company of Trinidad and Tobago *http//:www.atlantilig.com,* Cariri *http//:cariri.com,* or The Caribbean Association of Industry and Commerce (CAIC) *http//:www.Trinidad/net /caic*. All these sites are extremely informative. They offer information not only on the companies' profile, but provide a number of linked services as well, and a substantial amount of relevant information for business contacts and business co-operation.

An outstanding example of the business-to-public preference is the Caribbean Shopping site *http//:www.CaribbeanSN.com*, a remarkable practice on using the web technology to support business, but public life as well. A number of different technologies are in function here, including even a simple web mapping and the electronic database.

Figure 1.- Caribbean Shopping Site

Figure 2.- Cariri Technology Services

Another example, is the Telecommunication Services of Trinidad and Tobago *http:// www.tstt.net.tt/* which offers various on-line services for its customers, providing a two-way communication channel, and many links to the global search engines, international sites, banking institutions, etc.

A good example of business-to-public model is also the RBTT Bank Ltd., http//:www.rbtt.com, which provides financial services such as on-line banking (credit cards, loans, new accounts, etc.), or Nealco Real Estate *http//:www.nealco-real-estate.com*, the company which advertises properties for rent or sale, and contains updated information on current real estate market conditions. Users can obtain information on properties available, but there are other complementing services as well.

Tourism is an important part of the Trinidad and Tobago economy. Consequently, there are numerous sites devoted to that sector of country's development. While the majority is for marketing purposes, several of them use the web option in a more sophisticated manner. A good example could be the BWIA, the largest state owned international airline company in the region *http//:www.bwee.com* which offers not only flight schedules and information on different destinations, but on-line bookings and other services as well.

Government

Government constitutes the second biggest www user in Trinidad and Tobago. With respect to what is today a standard in the field, and taking the governmental sector as a whole, the Trinidad and Tobago current situation falls far behind the other countries' experiences. The state of the art for the time being indicates that the web-based option is only at the embryonic stage. Simple and reduced presentations of the government, its structure and bodies, are aimed at supporting the image of the government in the public, and provide relevant information on governmental departments, ministries and agencies.

On the local level (regional corporations), there have been very limited initiatives taken so far. It is worth mentioning though that Trinidad and Tobago is a highly centralized country, therefore the regional corporations have rather limited jurisdiction and responsibilities.

Figure 3. - Government Official Page

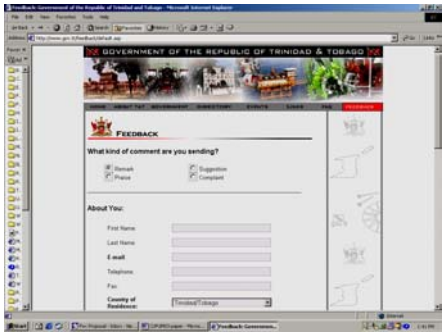

Figure 4. - Citizens-to-government communication

Regional corporations could be accessed through the Ministry of Local Government. The Ministry's site contains a remarkable amount of information, and provides links to all regional corporations. As for the regional corporations themselves, all sites are developed in a standardized and simple format, providing information on general office information, members of council, and alike.

Both the state government and regional corporations provide very minimal room for interaction between the general public and the governmental bodies- government-to-citizens, or for communication between the citizens themselves-public-to-public. The Government of Trinidad and Tobago site has a feedback option though, thus providing the citizens with an opportunity to send their comments and suggestions, or comment on the government activities. Using the web-based option to create a public realm, and a space where public could meet, is however envisaged in the strategic documents on e-development, but has yet to take fruition.

It is interesting to compare the situation in Trinidad and Tobago to what one can find in other countries.

The ongoing intention today, is to use web networking to enable geographically distributed users to access databases and computational resources, to provide efficient messaging and data exchange, and sophisticated real-time communication. Web networking is aimed at providing supplementary means to facilitate access to different information resources related to urban development and management, to sustain and foster further development of urban democracy, and to annex new forms of urban management to the existing ones. The ultimate goal is to construct a more comfortable urban milieu, and more democratic and fair social environment. In essence it may be described as having increased transparency, more effective public participation and public involvement, and improved co-operation.

The situation in Trinidad and Tobago is considerably different. Hardly any of the above mentioned features could be met here. It is rather the opposite the case. It is therefore characterized by:

1. The overall development and deployment of the web networking, compared to other countries, is rather low, at the embryonic stage only;
2. The total number of the typical www-based services is rather limited, mainly serving the basic functions in governing public affairs;

Figure 5. - Royal Bank-TT

Figure 6. - Tourism and Industrial Development

Table 1. - Government Openness and Transparency via www

GOVERNMENT OPENNESS AND TRANSPARENCY		Trinidad T&CPD	Tobago THA
Information on Central Government	Executive	+	
	Legislative	+	
	Judiciary	+	
Information on Local Government	Mayor	+	-
	Counsel men	-	-
	Administration	+	-
Access to, and communication with Local Government	Mayor	-	-
	Counsel men	-	-
	Administration	-	-
Participation in Local Affairs	Discussion	-	+
	Comments/Suggestions	+	+
Political Parties	Delegates/Representatives	+	+
Administration and Bureaucracy	Communication	+	+
	On-line information	+	-
	On-line form/requests	-	-

3. The main function of the existing government sites is to disseminate information, or selected data on government and its related bodies;
4. The transparency of government activity is rather low. There are some indications however, of a possible change toward a more open and cooperative work;
5. The citizen's participation is weak, and only in limited cases there exists an effective online communication between the citizens and the authorities.

There are two, strikingly different examples in this category, the Tourism and Industrial Development Company of Trinidad and Tobago *http//www.tidco.co.tt,* and Central Bank of Trinidad and Tobago *http://www.central-bank.org.tt/,* each of which offers a remarkable insight in its operations and relevant data. They are most certainly turning a new page in using the web-based alternative, and their experience deserves to be further explored and made known throughout the country.

Non-governmental organizations

Non-governmental organizations constitute a third group of the www users. While the NGO sector is quite developed in the country, the corresponding picture could hardly be obtained by observing only their web use. Local community and citizens groups, woman associations, family associations, different interests groups, etc., although very active on the public scene, have hardly, if at all, stepped into the www world. To a certain extent, this could be explained by the cultural model prevailing in Trinidad and Tobago, which assumes a face-to-face contact as a main communication channel, on the other hand, it is also due to the low computer availability at the time, and the low level of computer literacy in the country in general. Digital divide is a reality in Trinidad and Tobago.

The sites that could be identified in this category though, are as a rule designed and maintained by sport clubs and societies, clubs and committees, mainly those that are supported by the government or industry sector. Disseminating information on their activities is their main concern, and only in a very limited number of cases, other options (communications with visitors, e-mail, discussion room) have been explored.

Education

The fourth category includes educational institutions and organizations. A distinguished example in this category is The University of The West Indies site, the only one in this category that has a number of established services, and a very good potential for further development. Access to information has been the primary objective so far. A recent decision to start the on-line education programme has provided an impetus for further dynamic and vibrant development of the web based option. Compared to the situation of the only one year ago, a remarkable change has occurred, with the number of services operating for UWI students.

PROSPECTS FOR FURTHER DEVELOPMENT OF CIT In TT AND IMPLICATIOS ON SPATIAL PLANNING AND DEVELOPMENT

Trinidad and Tobago has gained a momentum in developing the CIT based alternative. The governmental "e" strategy provides a platform to build on. According to industry analysts, Trinidad and Tobago does have the potential to become a major player in the digital economy. The Cabinet - appointed National Electronic Commerce Policy Committee estimates that the rate of connectivity is growing steadily for both business and individual users. The foundation required to realize this potential has already been laid, vis-à-vis - there is basic infrastructure, there is a network, the

Figure 7. - The University of The West Indies

Figure 8. - UWI - Distance education

Government is committed to introducing the CIT, the private sector is embarking on the process, and there is an emergence of on-line business activity.

As always in times of great structural change, there are many questions that need answers. The specific situation of Trinidad and Tobago, being a developing country, calls for a comprehensive scheme, and specific actions to be designed and implemented on different levels, and within different stakeholders' framework. It is clear that the government cannot be the only "engine" behind the process. Co-operation and collaboration of all stakeholders is needed, if the ambitiously placed goal is to be achieved.

Apart from the National strategy already in force, other actions should include:

1. Supporting all interested parties to become proactive, instead of being responsive and "letting the technology happen";
2. Supporting national/local business in developing and using the web based alternative;
3. Supporting local initiatives, by developing specifically designed incentives for local community projects;
4. Opening up the educational barriers, and focusing on human capital. Approach the issue of the e-education in a comprehensively and with clarity of long-term vision;
5. Include the question of infrastructure provision/development into the national priority development plans;
6. Design and develop incentives for development of CIT;
7. Develop the appropriate regulatory and administrative framework in order to enable and encourage digital communications and transactions;
8. Creation of a high-quality local component, and use the technology to create local capacity;
9. Place greater attention on capacity building, civil society development, public participation, and alike; and
10. Include and encourage the local "Bill Gates" or visionaries in Trinidad and Tobago in the planning/development and visioning processes.

What would be the implications of these strategies and actions for planning and spatial development?

Despite the fact that the web phenomenon is relatively new in the profession and not yet entirely explored, in many countries and cities it has already been fully integrated into the planning practice. E-space is not only a place where people meet. It is also an economic place, a powerful economic resource that fully participates in shaping development of many regions and cities worldwide. At the same time, it is also a place where part of urban/spatial development and management functions takes place.

The global electronic network supports mobility in space and time, and as such is relevant for any planning or development action, be it at a local, national or international level. Transparency, efficiency and economy, the key words of the e-option, support a call for information networking on the Internet to channel organizational and operational resources for planning purposes. There are hundreds of thousands of operating modules with different tools in almost every city or region. Some countries, like Italy or Singapore have begun to gradually replace a traditional model of the face-to-face office work by the e-alternative.

The implications are even wider, and tackle the issues of urban and spatial structure and organization. In more developed countries where ICT have been implemented in a more thoroughly way, cities and regions are already changing their physical shape. Not that often is that visible, nor it has been explicitly brought to our attention. But let us not ignore the evidence which already exist, e.g., only in California there are more than 150 000 no-place jobs created only over the last decade, or the 50% reduction of trips related to the local government operations with their citizens, in Bologna. Distance education based on www has mounted up to 40% in some universities which subsequently has reduced number of trips, demand for housing, etc. There are many other examples which support the principle expressed in this paper that our cities and regions are on a big move, and will substantially change the way they operate and look, in the future.

CONCLUDING REMARKS

Technology-based paradigms, such as that of the information society, provide a multitude of means to a multitude of ends. In this paper, a distinction has been made between the ends and the means associated with this paradigm. The paper explored the state of the art of the means, but clearly it was the ends that guided the discussion.

Trinidad and Tobago possesses a "digital opportunity" and apparently many efforts and actions are on the way to transform this opportunity into the advantage for the country's development. The new Information and Communications Technologies provide several positive possibilities for the country from the individual to the societal level and are here to stay.

There are the questioning and doubting tones as well. In addressing the concerns of those who are skeptical to incorporate these technologies into the social, economic and spatial fabric of the country, it should be noted that CIT do not necessarily exist to replace existing and traditional mechanisms of doing things, but they do offer more efficient alternatives and as such provide options. In fact, new technologies offer the possibility, for the first time, to provide improved delivery at a reduced cost.

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INFORMATION

INSTITUTE OF ARCHITECTURE AND URBAN & SPATIAL PLANNING OF SERBIA

ABOUT THE INSTITUTE

The Institute of Architecture and Urban & Spatial Planning of Serbia (IAUS) was initially established in 1954 within the Faculty of Architecture of Belgrade University. IAUS became an independent scientific research organisation by the decree of the Republican Executive Council, with registration number N/303 recorded on 13/05/1961.

Nowadays, the Institute has 50 full-time employed personnel of different professional orientation, out of which 30 have obtained various scientific, research and higher education professional degrees. It also engages by contract a number of external consultants – experts in their professional fields.

The Institute's average annual income in the last three years is 600,000 euros.

RESEARCH ACTIVITIES AND AREAS OF RESEARCH EXPERTISE

The research and professional activities are organised within three units/ departments of the Institute:

1) Centre for Housing and Architecture

2) Centre for Urban Planning and Regional Development

3) Centre for Informatics, Publishing and Consultation Activities

The scientific research of the Institute can be grouped in accordance with the following fields:

1) Spatial planning and regional development

- Institutional, organisational and normative aspects of spatial planning
- Territorial determination of the regional development
- Urbanisation and development of settlements
- Metropolisation and other aspects of densification of activities, inhabitants and physical structures;
- Large investment projects and regional development, location rent and external effects;
- Regional development and spatial distribution of industry;
- Uneven territorial development and demographic problems in the mountainous regions;
- Major infrastructure systems;
- Landscapes and natural values;
- Energy efficiency, application of the renewable energy sources;
- Quality of surroundings and Quality of Living aspects in spatial planning, etc.

2) Urban and rural planning

- Urban scales and standards;
- Standards and legal regulations;
- Institutional organisation;
- Urban-economy and cadastral policy;
- Social and economic processes in urban regions;
- Landscaping of a territory;
- Urban heritage and urban structures;
- Rural-urban continuum (city and its hinterland);
- Organisation and structuring of village regions;
- Industry in urban regions;
- City centres - form, contents, function;
- Rationalisation of organisation and planning of urban regions;
- City infrastructure systems;
- Bio-climatic and energy efficiency planning;
- Public issues in cities, etc.

3) Architecture and building science

- Standards in building design and construction;
- Functional, esthetical, economic, social, ecological and other criteria in architecture;
- History of architecture and building heritage;
- Civil materials and civil technologies;
- Rationalisation of the building process;
- Rational use of architectonic constructions;
- Constructive systems and stability of buildings;
- Research on specific types of objects (industry, agriculture, administration, culture, services, finances, etc);
- Ecological research in architecture, bio-climatic architecture;
- Energy efficiency, etc.

4) Feasibility studies and environmental impact analyses

- Evaluation of economic, social and ecological feasibilities in planning and spatial organisation;
- Pre-investment and investment studies – feasibility evaluation of investment projects;
- Strategic analysis of environmental impacts (regional aspects)
- Previous analysis of environmental impacts;
- Detailed analysis of environmental impacts;
- Risk evaluation of emergency conditions, etc.

5) Information technology support

- Cooperation in development of the IT systems,
- Data base collection, systematisation, storage and distribution of data, and the development of indicators system;
- Networking with other data bases and IT systems, etc.

6) Publication work and educational activity

- International review "SPATIUM" (1-3 editions per year), editor N. Milaš in;
- National magazine "ARCHITECTURE AND URBANISM" (2-4 editions per year), editor M. Pucar;
- Monographs and other special editions;
- National and international scientific meetings;
- Post-graduate research;
- Seminars, courses and other educational trainings.

EXCERPT FROM THE INSTITUTE'S LIST OF REFERENCES IN THE PERIOD 2001 - 2005

A. Research projects

- (2005 - 2007) Sustainable spatial development of towns in Serbia (N. **Spasić,** Senior Research Fellow);
- (2005 - 2007) Methods for strategic environmental assessment in planning of spatial development for lignite basins (B.

Stojanović, Research Counselor);

- (2002 - 2005) Planning and management of the sustainable development under conditions of the transition towards market economy; institutional adjustments to the EU praxis and standards (M. Vujošević, Senior Research Fellow);
- (2002 - 2004) Development, spatial arrangement and the use of magisterial infrastructure corridors in Serbia (MIKS) (N. Spasić, Senior Research Fellow);
- (2002 - 2004) Sustainable development of the mountainous areas of Serbia (R. Malobabić, Senior Research Fellow, D. Dabić, Senior Researcher);
- (2001 - 2003) Enhancement of the solar energy use in photo-voltaic panels and solar collectors (A. Despić, Member of the Serbian Academy of Sciences, M. Pucar, Research Counselor)

B. Spatial plans

- (2001) Spatial plan for the Dunav-Sava river belt region - program and documentation background for the information basis (D. Perišić, D. Dabić, D. Djordjević);
- (2001) Spatial plan for the infrastructure corridor Niš – national border with FYR Macedonia (R. Malobabić);
- (2001) Spatial plan for the Kolubara region affected by earthquake (D. Perišić, S. Mitrović, S. Milijić);
- (2001) Master plan of Budva (N. Borovnica);
- (2002) Spatial plan for the area of lignite exploitation in Kostolac–Kovin basin – Strategy of spatial development (N. Spasić, V. Jokić, M. Vujošević, M. Radovanac);
- (2003) Spatial plan for the area of lignite exploitation in Kolubara basin (N. Spasić, M. Vujošević, V. Jokić);
- (2003) Spatial plan for the infrastructure corridor of the E-75 motorway in section Beograd – Niš (S. Mitrović, S. Milijić, M. Radovanac);
- (2003 - 2005) Spatial development strategy for Bar (B. Bojović);
- (2004) Spatial plan of the archeological site of Romuliana near Gamzigrad (D. Dabić, I Marić);
- (2004) Spatial plan for Valjevo Municipality – Strategy of spatial development (M. Maksin-Mićić, V. Jokić);
- (2004 - 2005) Spatial plan for Bor Municipality (M. Antanasijević, S. Zeković, M. Nikolić, K. Petovar, B. Stojanović, D. Dabić);
- (2004 - 2005) Master plan of Valjevo (D. Tošković);
- (2004 - 2005) Master plan of Bar (B. Bojović);
- (2005) Spatial plan for the National park of Kopaonik - Strategy (D. Dabić, S. Mitrović, S. Milijić);
- (2005) Spatial plan for the area of water accumulation 'Rovni' (S. Mitrović, S. Milijić);
- (2005) Spatial development strategy for Montenegro (M. Vujošević, N. Spasić);
- (2005) Spatial plan for the Republic of Montenegro – in working progress (Institute participates as a member of Consortium) (M. Vujošević, N. Spasić);
- (2005) Strategic environmental assessments for the following plans: Kolubara lignite basin; National park of Kopaonik; Stara planina mounitain region; Municipality of Bor, Kostolac-Kovin lignite basin, etc.

C. International regional projects

Professional experts from the Institute (M. Vujošević, B. Stojkov, K. Petovar, R. Malobabić, D. Dabić, O. Dželebdžić) have participated in preparation of several international projects in the region, either as the direct participants in realisation of the project or as participants at the international conferences dedicated to these projects.

In the last five years, chronologically given from the most recent ones, these projects are:

- (2003 - 2006) ESTIA-SPOSE: European Space – Territorial Indicators and Actions for a Spatial Planning Observatory Platform in South-Eastern Europe;
- (2003 - 2006) PLANET CENSE – Planners Networks for Central and South-Eastern Europe;
- (1997 - 2002) ARGEDONAULANDER project.

A number of the Institute's experts (D. Tošković, D, Perišić, M. Vujošević, B. Milosavljević, N. Spasić, S. Mitrović, N. Manojlović) have been project leaders or consultants on several urban and regional plans worldwide (e.g. in Libya, Tanzania, Yemen, Zambia, Angola, Algeria, Nigeria, Guinea Bissau, etc.)

The Institute intends to become a *National Focal Point* for the international cooperation in the domains of architecture, urbanism and spatial planning.

CHIEF REFERENCES OF THE INSTITUTE IN THE PERIOD BEFORE THE YEAR 2000

A. Research projects

- (1996 - 2000) Urban revitalisation of the cities in Serbia (B. Stojkov, S. Zeković, N. Borovnica)
- (1996 - 2000) Management of the spatial development in Serbia - Institutional and methodological aspects, systems and indicators (M. Bajić-Brković, N. Spasić, D. Dabić, B. Stojanović)
- (1995 - 1999) Use of the resources, sustainable development and spatial planning (N. Spasić, M. Vujošević, K. Petovar, N. Borovnica, S. Zeković)
- (1997 - 1999) Spatial planning in the function of a more balanced regional development, environmental protection and tourism development (D. Joksić)
- (1986 - 1990) Mining and energy complexes of industry – revitalisation of the territory (N. Spasić)
- (1986 - 1990) Spatial and urban planning and programming (M. Kojović)
- (1986 - 1990) Improvements in dwellings and residential utilities (B. Milenković)

B. Spatial plans/ studies

- (1996) Spatial plan of the Republic of Serbia (D. Perišić, M. Vujošević, K. Petovar)
- (1998) Study: Identification of the attractive localities in Montenegrin coastal area (N. Borovnica, M. Vujošević, S. Zeković)
- (1999) Spatial plan for the exploitation area of Kosovo-Metohija's lignite basin

(D. **Perišić, N. Spasić**)

- (1999) Spatial plan for the watershed area of **water accumulation 'Bogovina' (Z. Mirjanić)**

RESEARCHER'S PROFILE

1) Research Counsellors

- Dr Mila Pucar, BSc in Architecture
- Dr Dobrivoje **Tošković, BSc in Architecture**
- **Dr Božidar Stojanović, BSc in Technology**
- **Dr Marija Nikolić, BSc in Agronomy**

2) Senior Research Fellows

- **Dr Nenad Spasić, BSc in Architecture**
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- **Vesna Jokić, BSc in Spatial** Planning
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6) Researchers – Scholars of the Ministry

- **Ana Čarapić, BSc in Architecture**
- **Djordje Alfirević, BSc in Architecture**
- **Božidar Manić, BSc in Architecture**
- **Tamara Maričić, MSc and BSc in Spatial** Planning
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