Interactive planning - use of the ICT as a support for public participation in planning urban development: Serbia nad Montenegro cases

Introduction

Reconstruction of the towns with an aim to reduce pollution and mitigate the conflict of resources usage and possibilities of their renewal will be a critical planning problem of the new millenium. These problems cannot be solved only by professionals and experts. They require some methods that combine technical with economic and natural sciences on one side, and an intensive and active participation of a wide range of participants on the other. And this, of course, assumes a number of different and often opposing perspectives (Doyle and Batty, 1998).

On the other hand, it has long since been known that this rapid development of information and communication technologies (ICT), especially Internet, presents a global phenomenon affecting various aspects of human life, which is of special interest for this research and for the planning of a sustainable community development. According to the opinion of theoreticians and promoters of interactive and collaborative planning (Foreseter, 1989; Innes, 1995, 1998; Heally, 1997)[1], a plan results from the learning process among those involved in its development. Instruments that ensure a clear and open presentation of the analyses underlining the selections made, powerful enough to visualize the whole process, are those which can increase the understanding and involvement of the public in this planning process.

This paper will investigate the application of ICT as an instrument supporting the participation of the citizens in city-planning. This research deals with previous experience in the development and application of information and communication technologies (ICT) as a function of public participation in urban development planning of the cities and towns of Serbia and Montenegro. The paper will present the application of ICT in different planning stages, some examples of different spatial and problem levels. Beside information and cooperation, this work will analyse the role of ICT in citizen education intended to enable them to participate in the planning.

1. Theoretical framework: sustainable and collaborative planning

A starting point of this paper is the notion of sustainable development, a dominant concept of global development which assumes the harmonization of environmental, social and economic development. In city-planning, a sustainable development assumes, among other things, an active participation of the public in making some planning decisions on future development, including their responsibility for the implementation and outcome. Participation means an active involvement of citizens, i.e. users of that space, in spatial planning and realization, when they, using their potentials (creative, financial and operational), have a direct and important influence (Klein, 1985). Therefore it can be said that new planning forms are characterized by the “from-the-bottom-upwards” approach and practice of mediation in conflict solving (Rotondo, 2002).

Planning is a complex collaborative process (Halley, 1997) that 'prepares and formulates decisions concerning the future. Their final formulation is preceded by investigation of their consequences, but the consequences of previously implemented decisions are also investigated. Planning can be based on various values' (Bajic Brkovic, 1992), various methods and instruments of creation and realization of planning decisions can be used; decisions can be based on various development options (Davidov and Rajner, 1962 from [1]). The thing that is very important for us now is that planning assumes selection (Davidov and Rajner, 1962 from [1]).

All participants in spatial planning and arrangement have their own interest and ideas and all of them are trying to get answers to the questions: what, how and how much can they

achieve in the space. Identification of new needs, protection of interest and objectives, development of methods and techniques of conflict solving, i.e. fulfilment of agreements, are preconditions of planning.

The contents of new policies, programmes and plans proposed by institutions in charge of creating and adopting them often provoke concerns, hesitation and resistance of the public. That is why planning today is developed as a collaborative process (Haeley 1997) contrary to the «prepare-disclose-defend» concept. Collaborative planning assumes that discussion, collaboration and mutual respect will lead to consensus faster (Bedford, Clark and Harrison, 2002). Planning as a complex system used to direct and restrict development pursuant to the new needs has to become an efficient system to follow the changes and create a proposal in accordance with them (Lazarevic Bajec, 1995).

Participation is a process that represents a social heritage and civilization matrix. Making a city where people have the feeling of belonging and a wish and not compulsion to stay in that place, to improve and build it, considerably reflects the essence of the notion of social sustainability. «There is no sustainable city without creative activities of its citizens. An active citizen is a precondition. If a citizen is to be active, he has to be interested. To be interested, he has to be informed. To be informed, he has to live in a democratic system» (Pušic, 2001).

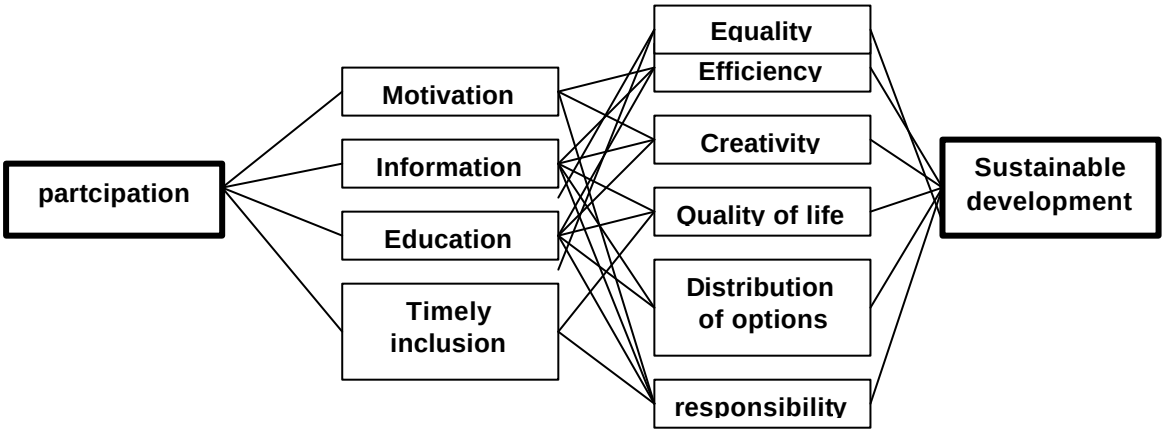


Figure 1. Participation of citizens as a necessary condition of achieving sustainability

Motivation, interest and ability of a community can be induced by timely information. Getting public familiar with the issues and problems that planners are facing makes the share of responsibility for urban politics and for changes of surrounding more equal and more fair. Involvement of public in the process of decision making results in a higher level of personal engagement of each individual. It is well known that accepted risk is proportionate to the level of involvement, i.e. it is logical that in this way a better support to planned actions and inovations is achieved.

2. Participation of the public in planning

Traditional approach to the public participation in decision making in planning has been considerably criticized lately (Healy, 1998) because it has proven to be insufficiently efficient and effective. There are two main reasons:

1. Most criticized is the usual way of public participation – public gatherings and meetings:
   - Meetings are usually very structured and every discussion is controlled by an authority from local management or institutions leading the meeting.
   - The language used on those meetings can be technical, which can make it difficult for some inadequately qualified participants.
   - The meetings are held at a scheduled time. All those prevented to attend for some reason are excluded from participation.

- The meetings are also held in certain predetermined places. It assumes some transportation costs expressed both in time and money.
- The meetings can be dominated by a small pressure group present at the meeting. Shy people do not usually want to express themselves in public.

2. In addition to that it is believed (Healy 1998, Tae Moon 2002, Kingston 2002) that access to the information is restricted, that there is no continuous inclusion of the public starting from the initial stages of the planning process all the way to the decision making process, that there is a huge number of people who do not actually know how to participate and in what areas, that unqualified people do not undestand the documentation.

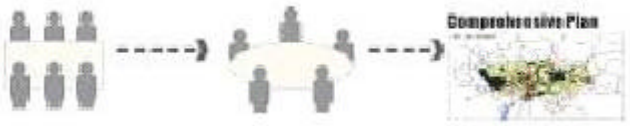
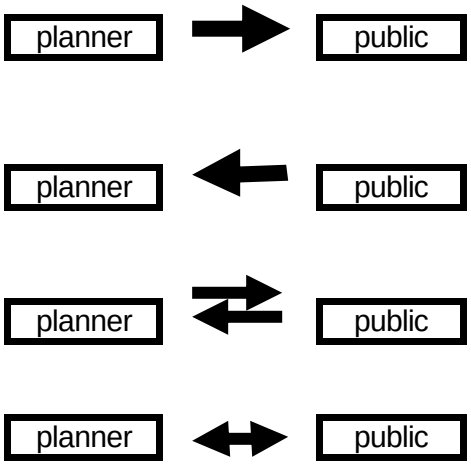


Figure 2. Traditional approach to the public participation in the planning process. Source: Moon, T.H. (2002): Web-based Spatial Hypermedia Collaborative Planning, Gyeongsang National University, http://regionplan.gsnu.ac.kr

This traditional approach assumes that the public has the «right to know», «right to object», but not the «right to participate in actual decision making» (Kingston, 2002).

a) Forms of participation

There are several different forms of public participation in the process of creating and adopting planning decisions. Simply said, these forms differ in type (one-way and two-way) and content of communication achieved between a planner and the public.



Education and information: distribution of information with an aim to create public awareness of necessary actions or topics
Feedback and initiatives:– public send the feedback so that the planner can have a better insight and deeper understanding of the problem. This also includes sending requests, questions, initiatives.
Inclusion in the process and cooperation: formal and informal dialog in order to identify problems. Public insight, discussion groups and forums.
Expanded inclusion means that the participants are able to contribute to the development plan or plan draft and to influence the decisions through mutual

Table 1. Forms of public participation in planning

b) Basic groups of participants

According to Bajic Brkovic (1992) «we interpret planning as an integral process of preparation, formulation and realization of decisions concerning the future and coordinate different subprocesses in space and time». According to Dror (1973) «in its essence (and in most cases also in formal and legal sense) planning is a process of preparing decisions that some other body will approve and implement». Therefore Davidov and Rajner expect that «a

full presentation of the proposed plan and consequences resulting from the chosen option have to be shown to the decision maker so that the decision maker can make a reasonable selection». In the entire chain of so defined process of decision making on space – in planning, there are participants grouped in different ways. According to some theoreticians there are three essential links: politicians, planners and citizens (Ralevic, 1995). A detailed list of participant groups relevant for the discussions concerning the community problems was defined by Sandman (1993, from [15]): neighbours, interested citizens, technical experts, media, activists, selected officials, business and industrial team and administration of local, regional and national level. According to REC (2000) interested parties are not always participant parties, but the participants can be divided into three main groups: public administration, income-based sector and non-government organizatons as a form of organized citizens. According to them a clearer classification of participants is based on their role in decision making so that there are: proposers, decision makers and public as the third interested party. This classification will be used further on.

Important for planning is awareness that motives for deeper participations are different for each group. Local politicians are motivated by the possibilty of being re-elected; they are aware that participation means better development (urban) politics that can ensure further economic prosperity of the community. Motivation of the planners is altruistic (mostly) therefore most complex: quality of space and quality of life are directly dependant on the quality of plan. Motives of he citizens are, naturally, a direct outcome of their concrete interest in those parts of the city and those problems that concern them personally (Pusic, 2001). We should also take into consideration the differences in their capabilities, resources, qualifications as well as in the level of influence that some decisions may have. In the light of these differences, it is not only proper but desirable as well to divide the participants in decision making to those who ensure the participation of public and other interest groups.

c) Benefits from the participation of public in planning

Participation of public in decision making is most efficient on local level, namely in the process of adopting spatial and urban plans. Not only that there is a regulated procedure of adopting these plans, which expects full presentation of certain plans and discussion with the proposers, but it is also expected that the citizens should be self-organized and initiate certain actions with an aim to imfluence the decision making. Total benefits from the public participation in planning can be presented by the following table:

Planner – proposer	Authorities – decision maker	Public
Planner's awareness on the impact on the community	More transparent and more responsible decision making	Possibility to show concern and influence decision making
Proposal becomes legiti- mate and better reception and support	Certainity that all issues of interest have been addressed	Better understanding and knowledge of consequen- ces of the decisions and of possible risks
Increased public trust in the plans	Accusation that decisions are made 'behind the back' is avoided	Awareness and knowledge of decision making process
Provision of local informa- tion	Promotion of good relation- ship between proposers and public	Increased influence of individuals and groups, which results in higher social responsibility
Decision making process can result in creative solutions previously unforeseable	Decision making process can result in creative solutions previously unforeseable	Participation of public offers a possibility of further education and comprehensive awareness that may result in consensus

Table 2. Benefits of an efficient participation in decision making. Source: Handbook for the participation of public in making decisions on living environment, REC, 2000

3. Characteristics of modern ICTs as a support of awareness, education and participation of public in planning decisions

In previous section we have concluded that there have been some shifts in planning paradigm from the approach "*planning **FOR** people"* towards "*planning **WITH** people"* (Tae-Heon Moon, 2002). Modern ICTs are a generator of big changes in the ways in which public can participate in planning thus changing also the ways of planning. A possibility is created to include and encourage entire communities and individuals in planning their own surrounding. New digital media provide us with a new way in which groups and individuals can influence and collaborate with the planners and politicians in researching their joint future.

In the last ten years some alternative methods of participation have been intensively tested and initiated and they have been supported by the development and application of ICTs, i.e. Internet, applications for visualization: 2D and 3D modelling, GIS and Virtual Reality (VRML)[i] and the combinations there of in the Planning Support Systems (PSS). In order to have a better understanding of their possibilities, we shall briefly address their charcteristics.

(1) GIS, PPGIS and web-based GIS

Geographic Information System (GIS) is an organized set of computer hardware, software and geographic data intended for collection, storing, updating, handling, analysis and presentation of geographically determined data in various forms (Banger, 2001). In the last three decades, GIS has brought some revolutionary changes in the ways in which the data on space are stored, analyzed and distributed. Such information assists us to manage the knowledge we possess, to organize and store it, to access and search it, to manipulate and apply it in the problem solving process (Longley, 2001). GIS is used for solving a wide range of planning problems.

However, this technology hasn't been fully used if it is available only to those who have technical knowledge and adequate software. In mid 1990s numerous examples were developed of GIS technologies application in the participation of public in planning. Generally accepted name for such adapted GIS is Public Participation GIS (PPGIS). PPGIS is a closed set of methods and technologies intended for public participation, presentation of various forms and combinations of spatial information depending on aspects selected for problem perception (Krygier, 1997). Thanks to PPGIS the public participation can start from the very beginning, i.e. from the problem defining process and all the way to its end, i.e. to problem solution defining and solution implementation monitoring. Technologies that support this approach can be designed so that they document and register the process of problem solving, enable all participants to follow and influence the selection of priorities and problem defining.

Combined with the Internet, GIS can be used to provide access to a wide range of citizens thus encouraging the community participation in planning (Hudson-Smith, Evans, 2001). Thanks to web-GIS that is becoming a powerful communicational tool between various interest groups it is possible to involve the public in the planning process from its early stages.

(2) 3D modelling and VRML

In order to make GIS more understandable to a wide audience, it has to be integrated with other ways of presenting information. Thus, in addition to PPGIS, soon some so called systems for on line visualization were developed as well as hypermedia presentations. They are a combination of text, GIS, 3D models, step-inside panoramas, photos, video shots, animations, VRLM and the Internet. In these systems the emphasis is on interactive three-dimensional and photo-realistic presentations available on line (Hudson-Smith, Evans, 2001). They serve for communication with the public in the planning process. Three-dimensional

presentation and VR on line systems can be used for various purposes, but their application is most useful in the processes of making spatial solutions and presenting ideas on future development. Thanks to them the citizens have an illustrative option to view, comment and vote for different development ideas.

(3) Planning Support Systems

Planning Support Systems (PSS) serve for a systematic search for solutions based on optimization principles. PSS is made by combining a series of computer methods and models into an integrated system able to support a planning process. For data processing and presentation, no matter if presentation or creation of solution proposals is in question, different visualization options are used (CAD, GIS, virtual reality, spatial multimedia, 2D, 3D visualizations and simulations). PSS link analytical tools and computer simulation models. They are based on a wide range of various knowledges, but their main component parts are:

- Mathematical theories for operationalization and modelling of the system architecture, and
- Urban theories dealing with the study of structures and conduct of urban entities as well as with constructing a scenario. GIS is a basic package, but it must be supplemented with theories and models of wider perspectives.

Due to their expressed visual component and possibility to have the effects of planning decisions presented both graphically and numerically, PSS are of great assistance in communication of different professions in the planning process, but the PSS users can also be the administration and citizens not necessarily with some specific technical knowledge, which is of special inportance for this research.

Connection of PSS with the Internet enables a collective design and group-based decision making. Thanks to PSS, the public can have an insight in the consequences of certain planning decisions, i.e. selection of planning policies and investments.

4. Application of modern ICTs in a planning process

Conclusions of some first pilot projects of using ICT as a support to the public participation in planning show that communication between different participants in the planning process has improved and that there are some positive effects in the form of better plans. A desired planning process is charachterized by the possibility to include public in each step of a planning process.

Besides these advantages and good sides, there is also a certain number of problems. Namely: the problem of access of necessary technologies to all involved groups of a community; trivialization of the decision making process; possibility of bias, i.e. inclusion of a desirable opinion in the system design and selection of the data and information to be presented (Hudson Smith).

As far as further development is concerned, the development trend of both technologies and literacy with computers and the Internet has an extraordinary rising tendency so that some important remaining issues and problems are the issues of institutional arrangements and capabilities of the planners and local administration to initiate a planning process as well as a decision making process. There are also the problems how to select information that can and should be publicly presented, the ways of such presentation, and how to encourage and motivate a local community to participate.

Participation of public in various stages of the planning process			IC Technologies and forms of communication they make possible		
Participation of public ↑	Plan adoption	Participation of all participants in plan adoption	On-line Decision Making Support Systems (DMSS)		one-way/two-way communication
	Process of preparing a planning docum.	Active participation of public in the creation of a planning solution	On-line Planning Support Systems (PSS)	↕	
		Public insight in planning documents, alternative options and scenarios with the possibility to react	On-line GIS, 3D i VR		
	Preparation of the plan	Requests to give opinions, conditions and approvals on development projects	On-line services – forms and documents in electronic form		
		Discussion about actual problems or wishes and visions for the future	On-line discussion forums		
		communicational barrier			
		information regarding problems in the field	On-line polls	↑	
		General information	Basic web site		

Tabela 3. Participation increase depending on communication forms made possible by ICT. Partly similar to the scheme from: The role of e-government and public participation in the planning process, Richard Kingston, XVI AESOP Congress, Volos, 2002

5. Public participation in the planning processes in Serbia and Montenegro: legislation and previous practice

The law on planning of the Republic of Serbia sets forth the procedures which define citizens as: initiators of the planning; persons interested in having a public insight in the draft plan; persons interested in being informed about the possibilities and limitations of spatial planning; investors in the issuance of urban approval, and those who break the law in which case they are charged predetermined fines.

In the procedure of public insight in the draft plan, the citizens usually come on their own accord to explain their written objections and get more familiar with the solutions. Cases in which the citizens hire lawyers or experts in certain fields or involve media, are rare but show an increasing tendency.

Participation of the citizens as initiators of urban design projects in which they are the investors (for small private companies, small industrial plants, gas stations, motels, farms, etc. or even for housing) is of more recent date. In this case, a citizen “follows the procedure” from initiation of the plan to its implementation, which is in his interest. With the plans of higher order (regulation plans, especially general plans) such participation is more difficult to achieve due to the differences of interests and difficulties in making a large number of users agree (Miladinovic et al., 1999). Attempts to include wide public in the processes that precede a draft plan (no matter if it is a Regulation or General Plan) have only just been started, i.e. they are still in an experimental stage.

6. Modern ICTs as a support to the public participation in planning in Serbia and Montenegro

(1) Development level of Informatics in Serbia and Montenegro

Citizens of Serbia and Montenegro (SCG) lag behind European Union in utilization of information technology so that in our country only four percent of citizens use the Internet while the average in Europe is about 30%. According to the data presented during the round table session *e-Europa*, held in Belgrade in 2002, it is estimated that we have one million of computer literate persons and about 500,000 computers, and that 350,000 citizens use the Internet.

At the ICT conference held on the initiative of OEBS in December 2001 in Belgrade, this situation in Serbia and Montenegro has been evaluated as follows:

- Weak points are the lack of legislation and of qualified staff, and insufficient infrastructure.
- In spite of this, the conclusion is that we have big potentials in this field so that in future SCG could become the Internet centre of the Balkans.

(2) Development policies and legislation regarding development and application of ICT

Even though in the second half of 1990s, a rapid increase of the Internet usage was noted in SCG, there is still no legal support to ensure an arranged and undisturbed development and application of ICT. The Law on electronic business operations has been adopted recently. This law is currently the only law in this field. In 2002 our country, together with other countries of South-east Europe, signed the project e-Europa which represents a transformation of an industrial into a computer society. By signing this, SCG has undertaken certain international obligations.

The decision of the Federal government of SCG regarding creation of conditions for establishment of an electronic administration is of great importance for ICT application as a function of public participation. This decision is a proof that the potentials of electronic presentation and on-line availability as a function of more efficient operation and democracy increase have been recognized on the highest federal level. In addition to the law and regulations intended to monitor and control the development and application of ICT, we need also some measures intended to encourage a responsible usage through education of a wide range of citizens. However, the issue of usage regulation, contents available on the Internet, diversity of the users as well as of the policy of ensuring accessability for a wide range of the citizens, has not been resolved in SCG yet.

7. Examples of application of modern ICT as a support to the public participation in planning in Serbia and Montenegro

Local city administrations in SCG have begun to discover the potentials of modern ICTs and their importance and influence on the social-economic development of the cities so that there are several examples of application of modern ICT as a support to development plans and programmes. Of all possible ICT applications as a support to the public participation in planning, only three can be identified in Serbia and Montenegro: (1) Notification about the plans being prepared and information about those adopted and actual; (2) Information about land and construction affairs management; and (3) Information and education about some possibilities of public participation in decision making.

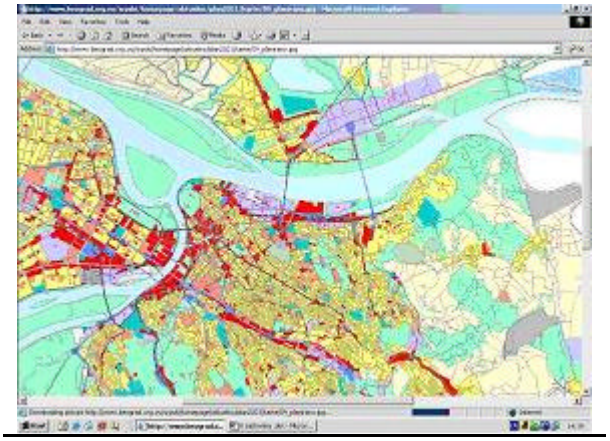
(1) Development plans on the Internet

Some characteristic examples have been selected which illustrate the development status and level of ICT applications as a support to the public participation in planning in Serbia and Montenegro. The plans on two different spatial levels will be presented:

(1) General plan as a strategic long-term plan covering the entire city territory - Belgrade and Nis, and

(2) Regulation plan as a short-term plan of a part of the city territory - Obrenovac.

Belgrade: The most developed city site in terms of ICT application in city development management and urban planning is the site of the city of Belgrade. A rapid development occurred in the last months of 2001. After the draft General plan had been made, the information about it and complete documentation of the plan was put on site. The public was invited to find more about this document and give their suggestions for its improvement. However, the site does not give a possibility to send comments, questions and suggestions electronically. The whole draft plan can be seen by downloading the files with texts, illustrations and 31 cards. Not only the plan but also entire information basis, analyses and studies can be seen. The cards are of a very good quality and of high resolution so that they can be watched as a whole or in parts.



The site also offers the instructions how to deal with a complicate procedure of getting a construction permit. A scheme is presented illustrating all the procedures and their chronology. This approach reduces the ignorance and helps the citizens defend their interests.

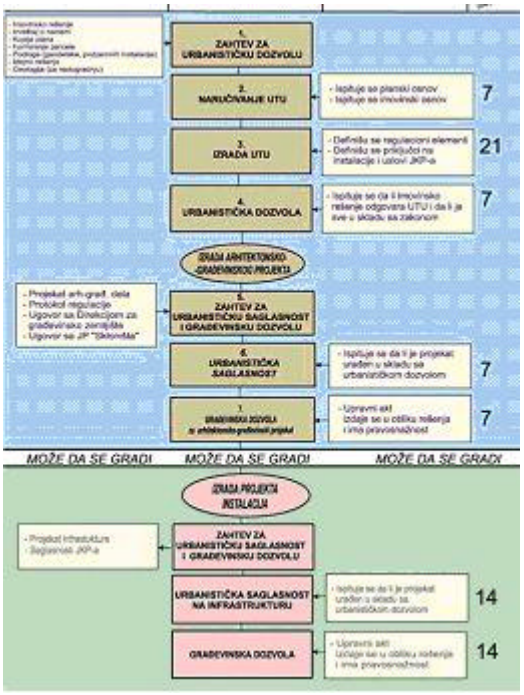


Figure 3. A complete textual and graphic presentation of a General Plan the city of Belgrade
Figure 4. A scheme of the procedure of getting a construction permit.
Source: www.beograd.co.yu

Nis: The second example is a proposal of the first modifications of and additions to the General plan of the city of Nis. On the site of the City-planning Agency, the public gets information and is invited to participate. The site, however, does not contain the instructions for further actions and procedures. It offers 6 graphic enclosures presenting 6 segments of the city territory. The cards are of bad resolution, it is not possible to have an overview and learn more about the details.

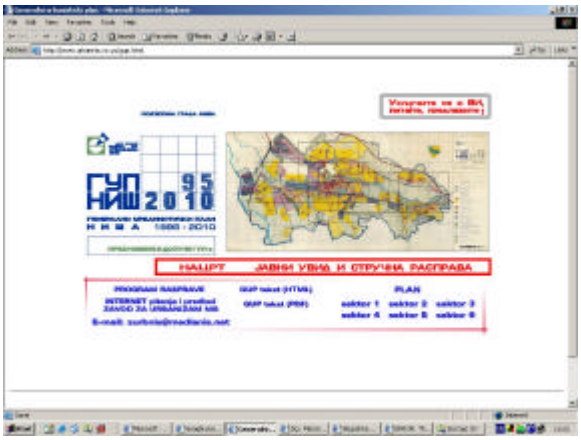


Figure 5 and 6. Graphic presentation of a General Plan of the city of Nis. Source: http://www.urbannis.co.yu/gup.html

Obrenovac: The site constructed by the Environment Protection Fund of the Municipality of Obrenovac offers some information about the projects and actions of importance for the environment of Obrenovac. The Regulation plan of the area called Zabran is one of such projects since it is a part of the zone included in the environment protection measures. Unfortunately, like in previous examples, except for a possibility of having an insight and several graphic enclosures showing the existing situation and plan proposal, it is not possible to send comments, start discussion and include the public in the plan adoption proces.

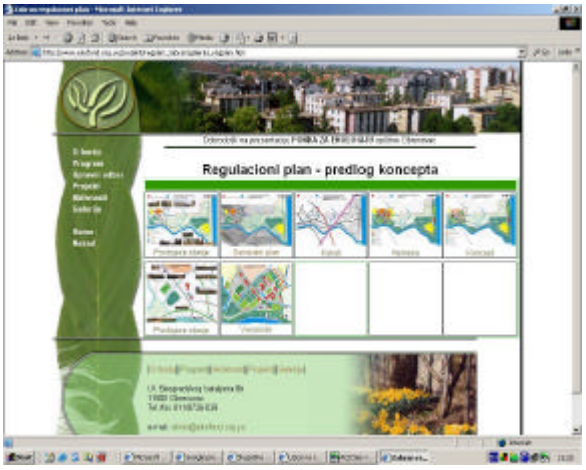


Figure 7 and 8. Graphic presentation of a Regulation Plan of the area caled Zabran in Obrenovac. Source: www.ekofond.org.yu

(2) Information on land and construction affairs management

Removing the lack of information regarding the possibilities of construction in an area is an important step in an attempt to enable the citizens to protect their interests. The sites of Belgrade and Novi Sad Agencies for land and construction offer some very illustrative and detailed information regarding some actual available locations in the cities and detailed description of procedures how to get them.

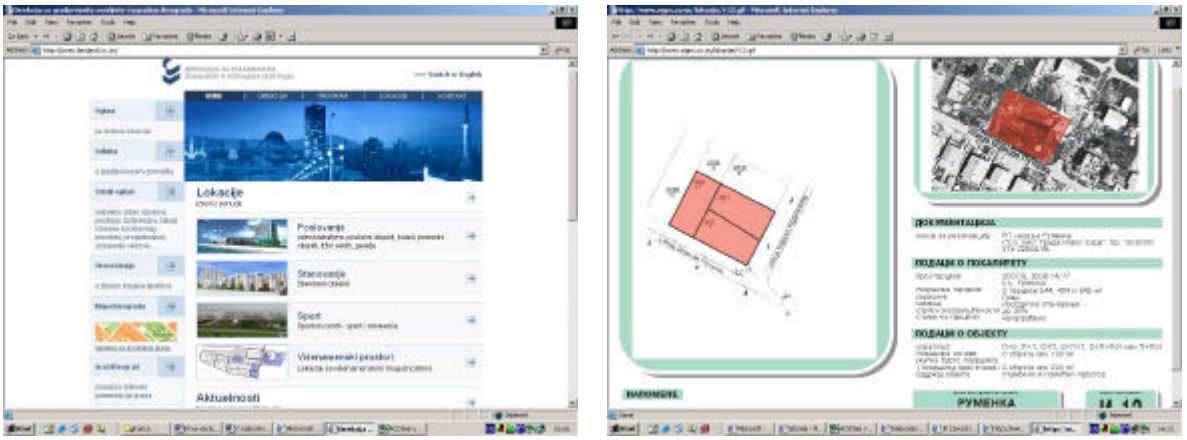


Figure 9 and 10. Information regarding some actual available locations in the cities and detailed description of procedures how to get them. Source: www.beoland.co.yu

(3) Information and education on the possibilities of public participation in decision making

In order to illustrate the utilization of the Internet and web technologies to increase public knowledge and education, we have chosen the site of the Regional Environmental Centre for Central and East Europe – Office in Serbia nad Montenegro (REC: http://www.recyu/yu/recyu/rec.htm). This REC office realizes the programmes of assistance in solving environment problems through promoting intersector collaboration among government and non-government organizations, local authorities, commerce and other partners, information exchange and support in public participation in environment related decision making. An Environmental Resource Centre – ERC – has been established as a part of the REC and is supposed to serve as a place where various information on environment can be found. Such information is given both in paper and electronic forms. By means of various communication forms, the ERC enables its visitors to participate in different environment protection actions. It is open to everybody: journalists, non-government organizations, scientists, government bodies, students and generally to all those interested in environment protection and maintenance. An interactive part of the ERC is its web portal (www.erc.org.yu). The aim of this ERC portal is to improve information exchange and public knowledge, to support non-profit sectors, increase public general awareness of the importance of environment protection as well as to strengthen the public influence on environment related decision making.

This site offers an easy and fast access to desired information. The content of this web portal is divided into several important categories. Each of them has its own data base. When searching these categories, the users are given several number of links with some basic data on the topic searched. The portal also has an option of message exchange among the users. The idea is that in future the ERC should be integrated into the National Information System for Environment that is still under construction.

8. Conclusion

Predominant understanding of the public participation in planning in Serbia and Montenegro still assumes that only some finalized urban ideas should be presented, i.e. it assumes the approval or disapproval of the final product. In best case several optional ideas are presented. The role of the citizens is neglacted in creating those ideas while development visions, objectives and programmes are being defined. Attempts to include general public in the processes that precede the plan are still too rare and it can be said that they are in an experimental stage.

We have already stated that the public participation as far as the potentials of ICT tools is concerned can happen in all stages of the planning process: from initial consultations

and all the way to adoption of the document, including the stages of implementation and monitoring. These tools can also be used as a support to the public participation on varous spatial and problem levels. However, in Serbia and Montenegro the potentials of modern ICTs as a support to the planning are used in a very small degree. This usage remains in the domain of constructing some web sites where the citizens can find information about some actual plans and regulations, i.e. the citizens are offered an insight in certain final planning solutions. Even such pioneer attempts and pilot projects are very rare and are not the result of a systematic national attitude. They are more the result of enthusiasm and clairvoyant individuals in certain administrations and planning agencies.

Some of possible causes can be the fact that in Serbia and Montenegro one of the biggest problem is still the access to the technology, lack of legislation and lack of political willingness. However, an even bigger problem is the lack of knowledge and willingness of the planners to include the public in the planning process from the very beginning. The reason lies in the inertia of institutional entities and lack of a legally binding obligation as well as in insufficient knowledge of ICT potentials in solving the planning problems.

On-line participation presents a good supplement to some classic, traditional ways of public participation. It should never be observed as a replacement and exclusion of existing techniques and models. It is only a new tool intended to improve the knowledge and level of public participation in the planning process. Modern ICTs are not a solution when we talk about democratization of the planning process, but they are a very efficient and effective support. Some preconditions for their full utilization are political willingness and public awareness that they can and should participate.

References

1. Bajic Brkovic, M. (1992): *Predavanja iz urbanistickog i prostornog planiranja*, Beograd: Arhitektonski fakultet Univerziteta u Beogradu
2. Bajic Brkovic, M. (ed) (1999): *Odrzivost i grad,* Beograd: Arhitektonski fakultet
3. Bajic Brkovic, M (2000): "Odrzivi razvoj i nove tendencije u planiranju", in Bogdanovic, R.; Stojkov, B.(ed): *Principi i praksa odrzivosti u razvoju naselja u Srbiji*, Beograd: UUS
4. Banger, S. (2001): "Integrating GIS with web for public participation", New Delhi: Hope Technologies, available at:http://www.gisdevelopment.net/technology/gis/techgi0058a.htm
5. Bedford T.; Clark J.; Harrison C. (2002): "Limits to new public participation practices in local land use planning", casopis *Town Planning Review*, No 3, Volume 73, 311-333, Liverpul: Liverpul University Press
6. Cabinet Office (2000): *E- government: a strategic framework for public services in the Information Age*, available at: http://www.e-envoy.gov.uk/ukonline/st rategy.htm
7. Campbell, H. (2002): "Planning: An Idea of Value", *Town Plannig Review*, No 3, Volume 73, 271-288, Liverpul: Liverpul University Press
8. Carver, S., Evans, A., Kingston, R. and Turton, I. (2001): "Public participation, GIS and cyberdemocracy: evaluating on-line spatial decision support systems", *Environment and Planning B: Planning and Design*. 28(6), 907-921
9. Carver, S.; Kingston, R.; Turton, I. (2002): "Virtual Slaithwaite: A Web Based Public Participation, 'Planning for Real' System", Oxford: School of Geography available at: http://virtualsociety.sbs.ox.ac.uk/pick/pick3.htm#1
10. Davidoff, P.; Reiner, A.T. (1962): "A choice Theory of Planning", in Faludi, A. (ed) (1976): *A Reader in Planning Theory,* Oxford: Pergamon Press
11. Doyle S.; Batty M. (1998): "Vitrual Regeneration", Centre for Advanced Spatial Analysis, London: University College, available at: www.casa.ucl.ac.uk
12. Dror, Y. (1973): "The planning process", in Faludi, A. (ed) (1976): *A Reader in Planning Theory,* Oxford: Pergamon Press
13. Echinique, M. (2002): "Forecasting the Sustainability of Alternative plans: The Cambridge futures experience", in *Creating Sustainable Urban Environments*, Oxford: 5th Sympsium of the UPE
14. Faludi, A. (ed) (1976): *A Reader in Planning Theory,* Oxford: Pergamon Press
15. Grupa autora (2000): *Prirucnik za ucesce javnosti u odlucivanju o zivotnoj sredini*, Beograd: Regionalni centar za zivotnu sredinu za Centralnu i Istocnu Evropu

16. Healey, P. (1998) "Building institutional capacity through collaborative approaches to urban planning", *Environment and Planning A*, 30, 1531-1546
17. Healey, P. (1997): *Collaborative Planning,* London: Macmillian
18. Hudson Smith, A.: "Online Planning: Web based 3D for Public Participation", London: UCL, available at: http://www.laser-scan.com/eurosdr/snith.htm
19. Hudson-Smith, A.; Evans, S. (2001): "Wired Regeneration: GIS in the third dimension" *GIS@Development*, 12/2001, available at:http://www.gisdevelopment.net/magazine/gisdev/2001/dec/wrgtd.shtml
20. Kingsto, R. (2002): "The role of e-government and public participation in the planning process", XVI Aesop Congress Volos, available at: http://www.ccg.leeds.ac.uk/democracy/presentations/AESOP_kingston.pdf
21. Krygier J. B. (1997): "Buffalo's Lower West Side: WWW Project", available at: http://www.geog.buffalo.edu/cjkrygier/krygier_html/lws/lws.html
22. Laurini, R. (2001): *Information Systems for Urban Plannig*, London: Taylor and Francis,
23. Milovanovic D. (2001): "Interaktivni urbanizam: novi oblici saradnje podrzani internetom i novim kompjuterskim tehnologijama", in Randjelovic N.; Ralevic M. (ed): *Urbani menadzment, urbani marketing i preduzetnistvo*, Beograd: UUS
24. Moon, T.H. (2002): "Web-based Spatial Hypermedia Collaborative Planning", Gyeongsang: National University, available at: http://regionplan.gsnu.ac.kr
25. Moon, T.H.: "Planning Support Systems", at: http://regionplan.gsnu.ac.kr/dpsc/main.asp
26. Pusic Lj. (2001): *Odrzivi grad: ka jednoj sociologiji okruzenja*, Beograd: Nova 175
27. Rotondo, F.; Selicato, F.; Torre, C.: *A Collaborative Approach To An Environmental Planning Process: The "Lama Belvedere" Urban Park In Monopoli (Italy)*
28. Upron R. (2002): "Planning practice: Ethics, Values and Theory"; *Town Planning Review*, No 3, Volume 73, 253-271. Viverpul: Liverpul University Presss

[i] (VRML is programming language used to create an illusion of three-dimensional objects in virtual reality. A computer creates and presents an illusion of creating by gradual changing of the observation point. The objects can be programmed to react on a mous click)