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PLANNED AND AUTONOMOUS ACTIONS: BELGRADE WATERFRONT ADAPTATION TO CLIMATE CHANGE

Nada Lazarevic Bajec, Marija Maruna*

*Belgrade University, Faculty of Architecture, Department of Town and Spatial Planning,
73/II Kralja Aleksandra Blvd., Belgrade, Serbia*

Abstract

There is broad consensus that adaptation to climate change is necessary and urgent. Numerous documents and guidelines are available that provide advice on how to incorporate climate hazards and risks into spatial policies on the global, European and national scale. The experiences of less developed countries have shown that, rather than simply cascading uniform procedures, methods and techniques of adaptation down from higher to lower levels of governance, a realistic approach calls for innovative procedures, tailored to specific circumstances.

The authors argue that the climate change adaptation (CCA) process in developing countries, especially post-socialist transition countries with underdeveloped institutions and procedures, differs from that seen in developed nations, which calls for taking these diverse (multiple) experiences into account when adaptation responses to particular local impacts are formulated. In that sense, adaptation is not necessarily guided by effective strategies that take into consideration overall economic, social and environmental goals, but is, rather, primarily intertwined with local spatial planning in an effort to reduce vulnerability to climate change and variability. This is mainly a reactive endeavour, as it lacks an anticipatory approach, but there are nonetheless some innovative qualities in each case that deserve to be closely inspected.

This argument is illustrated by an example from Belgrade, Serbia. The Heron Island Project on the Danube River, developed between 2006 and 2009, aimed to reduce vulnerability to flooding. In the absence of climate change adaptation policies and strategies in Serbia, the project sought to balance nature preservation with construction and CCA action. This demonstrative project can be analysed as an illustration of how climate change can be integrated into the planning system, as well as what different opportunities are available to incorporate adaptation into new and existing developments.

Key words: adaptation actions, climate change, developing countries, flood risk management, multi-level governance

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1. Introduction: Adapting to climate change

Scientific research summarised in the IPCC Fourth Report (IPCC, 2007) agrees on the assessment of the intensity of climate change (CC) and the threats it entails. We may therefore view the impact of climate change as a long-term natural disaster (Creig, 2010) that calls for comprehensive adjustment to regulatory and management tools.

The need to integrate CCA into all spheres of public policy-making also lends new weight to spatial planning and institutional change. Climate

change adaptation (CCA) was not adequately positioned in research and international policies at the initial stage of seeking adequate responses to CC. The emphasis on mitigation has since 2001 expanded to include adaptation (IPCC, 2001), as reflected in a range of newly-adopted documents, from the international (UN and EU) to the national, regional and local levels (Schipper, 2006).

In an effort to combine both types of policies, researchers seek an optimal mix of adaptation and mitigation. These policies are tightly interwoven, and reflect the view that more successful adaptation and

* Author to whom all correspondence should be addressed: email: m.ma@sezampro.rs; Phone: +381 63429145; Fax: +381 11 3370193

diminished vulnerability to CC reduce the need for climate change mitigation (CCM) (Burton et al., 2002).

Moreover, there is the distinction in theory as well as in practice between autonomous or spontaneous adaptation – defined as adaptation by households, businesses and communities acting on their own in the absence of established strategies – on the one hand, and, on the other, planned adaptation, defined as adaptation that is positioned within an established strategic framework (IPCC, 2001; Klein et al., 1999; Malik et al., 2010). Autonomous adaptation is usually reactive (ex-post) while deliberate, planned adaptation is proactive (anticipatory). Reactive adaptation measures are implemented in response to current climate variability and observed impacts. Conversely, anticipatory adaptation measures are undertaken before impacts are observed, in order to reduce exposure to future risks. Given the uncertainty surrounding climate change, the implementation of anticipatory measures is challenging, as they require in-depth information and knowledge of climate change (Klein, 2002).

Climate change research in general pays little attention to local adaptation experiences, examples of adaptation to extreme climate phenomena, and historical climate variability. It is stressed that, given that the world is increasingly faced with risks of CC that are at the edges of human experience, studying lessons from the past is extremely important for understanding adaptation strategies and processes by which adaptation takes place (Adger, 2003; Adger et al., 2003).

In the absence of institutional/organisational change, lack of information, knowledge and experience of managing development in the face of new challenges, CCA actions in developing countries can for the most part be classified as autonomous and reactive. On the one hand, that practice testifies to the realistic potential for dealing with climate extremes in low- or middle-income countries, and, on the other, points to the diversity of autonomous ideas that can be incorporated into integral adaptation strategies in the future.

The fact that, in less developed environments, the need to react to climate change comes before the development of proactive policy frameworks, emphasises the necessity of exploring the potentials for diversified approaches that would recognise local realities.

The aim of this paper is to demonstrate the importance of analysing CCA actions in local communities and finding out how adaptation ideas are formed and enter the policy arena. We argue that identifying the flows of initiatives and policies in response to climate variability should be a prerequisite for thoroughly understanding which governance mechanisms are required to ensure the scaling-up of policy and successful adaptation in specific circumstances.

2. Research framework

When one refers to CCA, one usually has in mind “actions taken by governments including legislation, regulations and incentives to mandate or facilitate changes in socio-economic systems aimed at reducing vulnerability to climate change, including climate variability and extremes” (Burton et al., 2002). Some sources define adaptation as any adjustment, whether passive, reactive or anticipatory, that is proposed as a means of ameliorating the anticipated adverse consequences associated with climate change (Smit et al., 2000). This study is focused on autonomous adaptation, classified not just as individual, spontaneous (IPCC, 2001), reactive, implemented by households or businesses, but also as action towards managing risk from excessive climate change that is not part of strategic policy.

Integrated adaptation actions are viewed as top-down, from the international, taken by organisations such as the UN and the EU, to the national, and, further down, to local levels (Margulis et al., 2008). Such a hierarchical approach requires thorough organisation, well-developed institutions, articulate actors, clear mandates, etc. Coordinated, strategic, planned CCA actions, comprising policies, programmes, measures and economic assessments, are deemed to be superior. If such actions are well-suited to the system within which they are carried out, with properly developed tools for implementation, they possess the potential to deliver considerable long - term effects for reducing vulnerability to CC (Smit and Pilifosova, 2001).

On the one hand, the state is by all means the major player, as a signatory of international agreements and the only entity with the authority to enforce them (Giddens, 2009). The national government level is also expected to help build adaptive capacity, i.e. establish regulatory, institutional, governance-related and financial conditions to support adaptation actions. This requires the engagement of both national authorities and other segments of society in defining strategies and policies, building the institutional framework, providing information, enhancing knowledge, etc. Activities at the local level are considered important but have to be embedded in the national strategic and policy framework. On the other hand, Giddens points to the emergence of a new system of governance that is characterised by the struggle for authority and division of interests, the assumption of power for decision-making and the taking of measures at the regional and local levels that may not be long-term or aligned with one another, but do provide answers to the problems identified. Local actors are re-defining their roles and, instead of endeavouring to defend the present, are coming up with creative solutions for the future (Giddens, 2009). Authorities at lower levels of government thus gain an important strategic role in overcoming the impact of CC, particularly through various forms of planning.

The problems and limitations of the efficiency and effectiveness of the synergy of different climate and socio-economic change scenarios seen in the top-down approach have redirected focus towards the potentials of bottom-up adaptation actions. The vulnerability - based approach that relies on understanding and mitigating vulnerabilities, rather than on scenarios and precise projections (like the hazards-based model), requires a better understanding of the context. It is at its most suitable in circumstances where existing risks are inadequately managed or pose great uncertainties with regard to future climate impacts, and where climate and other factors are firmly intertwined, primarily in short-term planning with limited funding. Developing countries often resort to policies focused on short-term improvements through the management of existing climate-sensitive risks which at the same time attempt to cover a range of possible climate projections (Füssel, 2007).

2.1. Strategic approach

Generally, the strategic, integrated approach calls for interlinking adaptation policies with all areas of public policy. The level of governance to start with is the national level, which lays out the necessary framework for actions addressing CC challenges. It is also recommended that adaptation actions are developed as a part of various sectoral policies. Developing countries are also expected to define concrete adaptation strategies and plans, along with action programmes at the national level, and to integrate them into the work of government structures. National adaptation strategies provide skeletal support for harmonised management at lower levels of hierarchy, and the implementation of plans and projects in compliance with general policies and criteria.

Climate-change-adaptation-related actions shaped by international (UN, EU) documents involve deliberate coordinated anticipative actions taken at different decision-making levels of government. This includes legislation, regulations and initiatives aimed at reducing vulnerability and building resilience to climate change, including climate variability and extremes. In order to achieve a high degree of adaptation, the government must meet certain criteria. First of all, according to IPCC, 2001, the importance of a stable and prosperous economy is emphasised, as are delineated roles and responsibilities for the implementation of adaptation strategies. It is also argued that problems and limitations associated with CCA policy and integration of climate policy into all other public policy areas call for realistically assessing all possible courses of action and opting for an adequate one (Swart et al., 2009).

The role of the highest level of government in setting an effective policy and institutional framework, as well as in providing information, knowledge and resources for adaptation, is definitely

important, though not necessarily crucial. Governance processes cut across sectors, along horizontal and vertical lines, from the local to the global level and vice versa. The key problem in policy formulation and integration is to ensure coherency of actions and define responsibilities.

2.2. CCA and spatial planning

Spatial planning plays an important role in the implementation of climate change adaptation measures and policies; in this sense, entities are urged to broaden the scope of all plans and programmes with potential effects on risk and vulnerability (EC, 2000; EC, 2003; EC, 2007). Issues are raised of the character of planning, types of measures and cooperation with other sectors (e.g. integrating land use planning and water resource management in support of risk mitigation) as is, in particular, the need for stronger integration with civil protection measures. In that sense, climate change adaptation should become an integral part of the planning process, paralleling, for instance, the way in which environmental impact assessment is today integrated into all strategic plans and projects (Peltonen, 2006).

Climate change has largely changed the planning context and priorities. A new rationale for coordinating actions and integrating policies has been introduced (Davoudi et al., 2009). As pointed out in research, the risks associated with CC or other changes need to be assessed on a practical level (Smit and Wandel, 2006), linked with land use objectives, and further coordinated with development objectives that are consistent with adaptation (Schipper, 2007).

Complex problems such as CCA can be overcome by establishing a framework for integrated development, e.g. through "strategic planning which anticipates new tendencies, discontinuities, and surprises; it concentrates on openings and ways of taking advantage of new opportunities. Strategic plans are defined as frameworks for action" (Albrechts, 2004). In challenging development conditions, the problem is how to change traditional legally-binding land-use planning that is well-established in practice, passive, pragmatic, and that provides "physical" solutions to social or economic problems. Identifying the feasible boundaries of change within a planning regime that would provide at least some opportunities for successful CCA actions is important, as its learning potential for broader changes could be vital (Lazarevic Bajec, 2009).

3. Methods

In this exploratory paper the focus is on the Heron Island case study, which demonstrates the experience of the local community in using available instruments to develop a pilot project for the introduction of autonomous CCA actions. Multiple methods were used to establish the project design

process and investigate how adaptation actions influence strategies made at higher levels of governance. Firstly, policy documents at the national and local levels were analysed to establish the state of CCA activities in Serbia. Although there had been no official CC policies prior to 2010, a close reading of existing sector policies in the fields of environmental protection, water management, disaster protection, spatial planning etc. helped identify some links with strategic and statutory documents. Secondly, interviews with policymakers and planning professionals who played an important role in the project development were recorded and analysed. The purpose was to establish local strengths and weaknesses, and to discover what adaptation knowledge base was used in the project and how external influences shaped spatial ideas that helped integrate CCA concerns into the project.

Thirdly, international and national government policy documents, reports, and instruments were assessed in order to find out possible directions for changes to the hierarchical mode of governance towards a more collaborative one that would enable the integration of innovations into CCA policymaking in Serbia.

Because CCA is a new field of policy in Serbia, it was difficult to directly trace policy interplay from the bottom up. Analogies were therefore made with other (environmental) spatial policies with longer traditions, and, based on this approach, assumptions were arrived at of how the bottom-up policy might work.

4. Case Study: Heron Island Project

The argument of this paper is illustrated with an example from Belgrade, Serbia. The Heron Island Project on the Danube River, developed between 2006 and 2009, aimed at reducing vulnerability to flooding and sustaining waterside ecosystems that have essential environmental functions. In the absence of climate change adaptation policies and strategies in Serbia (Lazarevic Bajec, 2009), the project sought to balance nature preservation and construction through CCA action. This demonstrative project can be analysed as an illustration of how climate change can be integrated into the planning system, as well as of which different opportunities for systemic change are offered by local initiatives.

Although many autonomous activities geared towards CCA can be discerned in Serbia, they are often not recognised as such, but are rather connected with defence against natural and technological hazards, sustainable development, and the like. Climate change adaptation did not feature at the policy level in Serbia until its first mention in the The Law on Spatial Plan of the Republic of Serbia from 2010 to 2020 (SPRS, 2010) and Serbia's first Initial National Communication under the United Nations Framework Convention on Climate Change (Bozanic and Gasperic, 2010). These documents give clear support to a strategic hierarchical approach as an

essential prerequisite for the implementation of concrete measures in managing CCA actions.

The Heron Island Project entails the formation of a new island on the foreland of the left bank of the Danube (separating it from the mainland and protecting its forests, swamps, canals and potential beaches) that would stretch across 582 hectares and be intended for a multipurpose tourist, sports and recreation centre. The project was developed in cooperation with the Town Planning Institute of Belgrade and the University of Florence. Underpinned by planning principles that merge land use with social and ecological planning, the project prioritises policies designed to avoid adverse impacts of natural hazards by providing flood spillover areas in case of elevated water levels.

The project offered an opportunity for a detailed examination and implementation of goals and objectives defined by the Belgrade Master Plan 2021 adopted in 2003 (Fig.1). Thus, in the absence of an integrated water resource management strategy, it anticipates the shift from traditional "flood defence" to innovative flood management, characterised by designating land for mixed use, including tourism and recreation; strengthening natural resources through the formation of a protective green belt around the city; and reducing the risk of climate-related disasters while safeguarding the authentic vegetation of foreland, pond and swamp ecosystems in order to preserve the Danube River waterfront as it looks today and contribute to landscape preservation and development (Fig. 2).

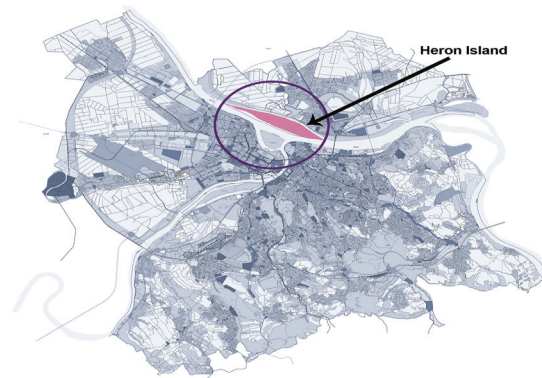


Fig. 1. The Belgrade Master Plan 2012 recognised the confluence of three river branches, the existing islands and the new Heron Island as the *genius loci* of the city and the main focus of care and protection, as well as the site driving genuine future development (TPBI, 2003)

The Heron Island Project is based on projections that indicate climate change may cause more intense flooding and drought episodes (Fig. 3), greater in both their scope and duration. The project is a response made by local professionals to the idea of Belgrade's expansion onto the left bank of the Danube formulated in the Belgrade Master Plan 2021 (TPBI, 2003).

It is also an answer to the official position of the National Water Management Agency that there will be no government intervention to construct or

raise river dykes for preventing flooding along that part of the river. The basis of the project is the acceptance of an ecological approach that sustains the capacity of ecosystems to respond with resilience to external changes, which fits in with adopted national policies and strategies on sustainability.

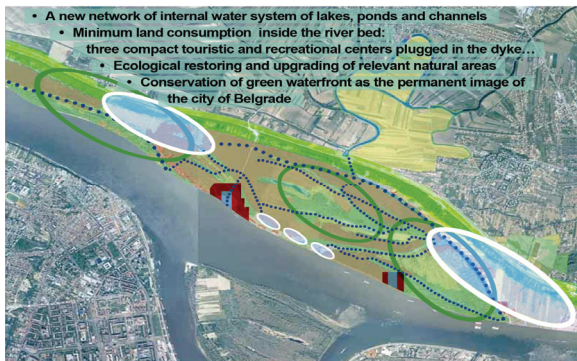


Fig. 2. Heron Island Project (Source: Lazarevic Bajec, adapted from Town Planning Institute, 2009)

4.1. Adaptation to flooding

The shift from the standard mode of thinking in the Heron Island Project was provoked by a study conducted by Varga and Babic-Mladenovic (2001).

This study, unusual in local terms, presented international water management experiences and recommended the abandonment of the “flood fighting principle”, which relies on large-scale and investment-intensive construction (dams, accumulations, dykes, watercourse management, flood relief channels etc.), in favour of “living with floods”. It is a new, integral concept of flood protection that fits in with the concept of sustainable development, striving to balance the “human” component (the safeguarding of human lives and protection of property) with the “environmental” one (preservation or recovery of natural functions and resources of a flooded area) (Varga and Babic-Mladenovic, 2001).

It should be noted that this new approach introduced in the Heron Island Project was not in line with official flood protection policies adopted by Srbijavode, the National Public Water Management Enterprise, which favours building massive facilities and systems. Formulating the official national formal flood control policy in Serbia is the task of the water management sector, and is embodied in the General Flood Defence Plan and the Annual Plan for Flood Defence, which are in turn supported by a programme of investment into infrastructure. It is important to underline that plans are prepared only for watercourses with existing flood protection structures. Other locations are left to be dealt with local communities (ICPDR, 2009).

4.2. Exogenous knowledge

The authors of the Heron Island Project place special emphasis on the experience of the

Netherlands, with its new “Room for the River” policy, a tailor-made, flexible approach to water management. This national programme, launched in 2006 and due to finish in 2015, relies on a climate change forecast to 2050.

“The menu of existing adaptive measures, compiled through learning from the past, may however not be sufficient to enable policymakers to select projects to maximize net benefits with climate change, as future climate patterns may be very different from current patterns. Thus it is important to complement understanding of current adaptation measures with identification of additional measures that may be needed to deal with projected climate variability.” (Margulis et al., 2008).

Key adaptation measures under the Heron Island Project go along the lines of linking water and land use, incorporating alternative flood risk management into innovative mixed land use practices, master landscaping and improving overall environmental conditions, etc.

The project envisages the construction of island settlements in the form of floating structures – floating villages – located on water canals that will cut through the island and be accessible from the river (TPBI, 2003).

The authors’ vision of the project is that of a “model of development harmonic with natural environment, an approach that at the same time introduces a dialogue with the pure Belgrade tradition of intimacy with the great river” (TPBI, 2009).

What is poetically dubbed “intimacy” is actually a set of autonomous actions of adaptation to climate change and variability, floods and storms, non-planned and spontaneous, which have a decades-long history in the Sava and Danube riparian area (along a 153 km stretch of riverbank in Belgrade). A variety of shoreline activities have made innovative use of the riverbanks, discovering autonomous adaptation modes. Houses, rafts, boats, and marinas that have emerged outside of the system of official policies and control have markedly changed the waterfront landscape (Fig. 4).

4.3. Endogenous knowledge

The authors of the project display an awareness of the importance of detailed design guidelines. Learning from experience, they propose light constructions, floating houses, linked to the tradition of spontaneous construction on Belgrade’s rivers (autonomous adaptation), leaving the landscape uninterrupted, interacting directly with the alternately rising and falling water level of the Danube. However, concrete technological solutions are modelled on international practice (Canada, the Netherlands, UK, and USA) (Fig. 5).

Interestingly, the proposal to use floating structures, the autonomous form of adaptation on Belgrade’s rivers, the Danube and the Sava, whose levels commonly dramatically oscillate and which

are prone to flooding, came from Italian partners on the project. The local professional community needed international validation to integrate autonomous forms into planning proposals. Planners from the Town Planning Institute of Belgrade commended the approach applied by Giovanni Ruffini, an architect from the University of Florence, who suggested floating structures as a prevailing modality of “construction” for continuing the tradition of using riversides in Belgrade (TPBI, 2009).

The approach envisages the siting of floating villages on water in the new internal lakes, and along stretches of water and canals (TPBI, 2009). In addition to embracing autonomous adaptation forms as a functional solution to persistent threats of flooding, the project promotes floating structures and pile dwellings as an integral part of Belgrade’s identity and the city’s relationship with its rivers (Fig. 6). The proposed alternative to riverside construction on solid soil, which would require erecting costly levees, are floating villages, following years-long practice of adaptation to climate variability on river banks that has given rise to a specific landscape. In this way, rather than being denied, unplanned and autonomous experiences are embraced, tested and embedded into local spatial projects and plans.

It seems only natural that, given the limited experience and knowledge in the new policy field, local actors should turn towards established (international) authorities. The outcomes of the communication and learning process are expected to be greater self-confidence, lessons learned on how to interpret successful spontaneous adaptation examples, and altogether advanced adaptive capacity.

5. Discussion: bridging the gap

Unlike in developed economies, a CCA policy framework is only now starting to emerge in transition (post-socialist) and developing countries such as Serbia. Local adaptation policies are not adequately supported at higher levels of governance. At the national level, CCA is mostly considered in the context of recommendations by international organisations, fraught with persistent frustrations of decision-makers, researchers, planners and other stakeholders involved in CC response activities who are unable to respond to requirements from the international (EU) level and adequately position and coordinate their efforts, or, rather, to translate the mitigation of vulnerability into on-going CC adaptation actions.



Fig. 3. Emergency repairs with sandbags and flooded restaurant on the Zemun waterfront in Belgrade at high water levels in 2006 (Lazarevic Bajec, 2009)



Fig. 4. Autonomous forms of adaptation: floating restaurants and homes on the Danube and Sava rivers in Belgrade (Lazarevic Bajec, 2009)



Fig. 5. Utrecht (Holland) floating houses (deliberate CCA actions) (Lazarevic Bajec, 2009)



Fig. 6. Autonomous adaptation to flooding on the Sava and Danube Rivers (Lazarevic Bajec, 2009)

There is a gap between the procedures proposed by researchers and international organizations and the ill-fitting system of government (Slunge et al., 2008). Against the backdrop of poorly developed national framework, climate changes, variability and hazards all provoke bottom-up actions.

Integrating autonomous adaptation experiences into development policies is much more important for developing than for developed countries because of their greater vulnerability, limited resources, low level of technology, institutional inefficiencies etc. The planning model in developing countries, especially post-socialist transition countries with under-fledged institutions and procedures, differs from that applied in developed countries, urging the adopted planning model to make room for the identification of successful instances of autonomous adaptation, interaction between autonomous and planned actions, and top-down and bottom-up initiatives. This is the reason why it is argued that, in less-developed countries, adaptation can be effective only when linked to local development issues. It should be noted that in developing countries the general problem is the lack of capacity to produce good strategies, both development-related and adaptation ones, and the challenge is to manage the necessary actions in that specific situation.

Multi-level governance is the key for successful integrated adaptation policies. However, in many countries with strong centralised hierarchical traditions, establishing a coordinated governance system is no easy task. The fact that coordination, both horizontal and vertical, is considered a crucial precondition for the successful implementation of CCA should not discourage adaptation from taking place at the local level. The concept of strengthening local-level governance in Serbia should be supported, and space for independent local CCA projects secured, regardless of whether they operate within a national strategic framework or depend on international assistance.

Local authorities strive for more influence on the adoption of national policies, on the coordination of policies relevant for local development, and on the institutionalisation of local representation in national government (Damjanovic et al., 2011). However, scaling bottom-up strategies up into national policies is an issue of governance reorganisation connected

with power relationships. Even after a decade of democratic development in Serbia, local authorities have yet to enjoy success as agenda setters. For example, local governments in the Danube River basin have to date achieved operational independence in flood risk management in only a few cases (Belgrade, Novi Sad, Smederevo). They have reconciled conflicting policies through urban planning by introducing innovative flood protection ideas, although they have brought about no changes in formal water management strategy.

The project has encouraged local communities on the right bank of the Danube to protest against official policy and put pressure on policy changes and the extensive reconstruction of levees that are changing the landscape of the historic city. They expected CCA adaptation integrated into local urban planning criteria to produce better flood protection solutions. Although the Serbian Water Management Agency has refused to change its policy, in this case there have been some changes in the approach to flood defence plans. Recent strategic documents have modified the water management approach and defined targets and measures to be taken for regulating land use and spatial planning, increasing retention and detention capacities, as well as building capacity and raising preparedness (ICPDR, 2009).

As in other developing countries, a two-tier CCA approach can be expected in Serbia (Lemos et al., 2007). On the first tier, efforts would be focused on the establishment of effective climate disaster management, in response to direct hazards related to CC and climate variability. Adaptation policies are predominately intertwined with local spatial plans, which are usually the best-developed form of such planning. The second tier would include the implementation of reform policies addressing structural problems related to inequalities and human vulnerability, working on new forms of governance at local and national levels, and building adaptive capacity among government bodies, businesses, scientists, and individuals. Thus, adaptation efforts can act as a trigger for transformation and change in governance structures (Fig. 7). Although extensive research and documents produced by international organisations do put forward the most efficient and effective procedures aimed to respond to CC challenges, there is clearly no uniform solution. As put concisely by Creig: "The problem is, in this brave new world of climate change adaptation, there will be

no panaceas – ‘one size fits all’ solutions to environmental problems – particularly in the realm of natural resource management” (Creig, 2010).

The case of the Heron Island Project can serve as an appropriate illustration of a practical response to CC and variability hazards against the backdrop of an underdeveloped policy and regulatory framework. Given the lack of coherence between higher and lower levels of government, the Project is in line with the advice to formulate “easy adaptation measures” as a way to raise public awareness and encourage development of plans and regulations in different sectors, ultimately leading to adaptation to variable climate conditions (Nagy et al., 2008). This practice may be risky because there is no strategic agreement and the realisation of projects is questionable.

However, at the same time, it allows for experiments and innovations that may hopefully lead to system adaptation. The importance of the Heron Island Project lies not only in its quality and proposed adaptive actions, but also in the manner, process and method of planned CCA actions, which,

in the absence of national strategy, use the results of international policies and mix them with traditional informal experiences. However, given the poorly-developed policy and regulatory framework in Serbia, the path of shaping ideas and concepts was not straightforward. Local experiences in tackling flooding were validated by comparison with foreign examples founded on research and assessment-supported adaptation strategies. The cooperation with Italian experts, who provided the relevant information, knowledge, and experience, boosted the self-confidence of local experts and enabled them to recognise good solutions in their own environment and use them creatively.

The project also takes into account the fact that CC creates a dynamic environment, prompting the search for innovative solutions, different from the common top-down planning approach that reduces adaptation measures to large-scale infrastructure-based interventions associated with physical protection, such as the massive concrete levee being built to replace the old stone one in Zemun (Fig. 8).

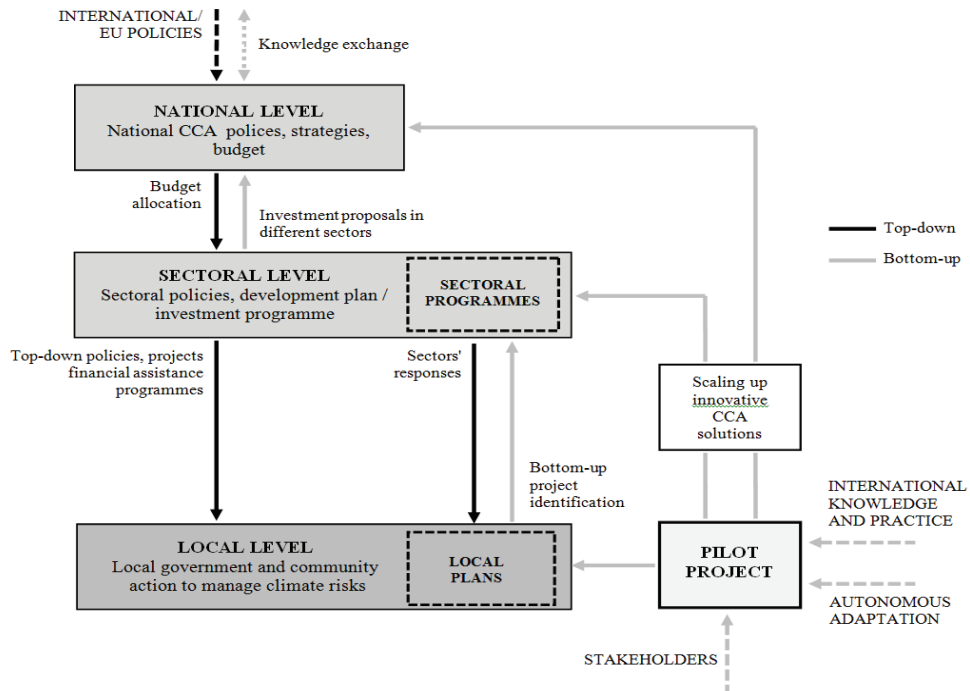


Fig. 7. Delivery of adaptation through the planning system in Serbia. Role of local projects and external influences (modified diagram from OECD, 2009)



Fig. 8. Flood protection structure on the right bank of the Danube: Old and new levees (Lazarevic Bajec, 2009)

6. Conclusions

The paper analyses some features of procedures and methods for formulating CCA actions that are altering the urban landscape of Belgrade, Serbia. A detailed description of the Heron Island case was presented so as to give insights into the process and define the place of local projects in the system of CCA decision-making in Serbia. The idea is to understand the potentials of a bottom-up local CCA project and to analyse the influence such projects might have in developing a multi-level system of governance.

The Heron Island Project, presented in the paper, is an authentic product that emerged from familiarity with local circumstances, different spatial development requirements, proposals modelled on local traditions, and knowledge generated from experience. Although uncertainty may make it difficult to fine-tune adaptation, there are grounds to assume that the CCA approach applied in the project will ensure sustainable solutions and coordination with the Directives from EU level, considered key tools for cross-border cooperation and the adaptation of the water sector to climate change.

Spatial planning, which is in most countries institutionalised and based on the principles of environmental sustainability, can play a significant role in CCA. In addition, given the limited knowledge of local planners in this field, emphasis should be placed on the integration of planning and science, a trans-disciplinary approach that would facilitate the search for adequate responses to specific problems induced by CC. Spatial planning in Serbia can be expected to adopt a more strategic approach and develop flexible and adaptive planning instruments in the future.

This paper presents a CCA case study in seeking to assess the relevance of local autonomous actions for the transformation of urban planning in Serbia into a model that relates to the country's changing institutional organisation, social and economic relations, and governance structure. It is argued that the planning model in developing countries should make room for the identification of successful autonomous adaptation, interaction between autonomous and planned actions, and integration of bottom-up initiatives into policy making.

The Heron Island Project, though not employing the current rhetoric of CCA adaptation and mitigation, is actually aligned with all contemporary requirements in this area. One should not over-romanticise local initiatives and creative capacities. The paper emphasises a bottom-up approach to integration that effectively combines local capacities with those from external experts, and so contributes to the building of the necessary national CCA policy framework, an important step towards a more strategic approach in planning.

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