ASOCIJACIJA PROSTORNIH PLANERA SRBIJE
UNIVERZITET U BEOGRADU - GEOGRAFSKI FAKULTET

PLANSKA I NORMATIVNA ZAŠTITA PROSTORA I ŽIVOTNE SREDINE

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ASOCIJACIJA PROSTORNIH PLANERA SRBIJE
UNIVERZITET U BEOGRADU - GEOGRAFSKI FAKULTET

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UVODNA REČ

Dvanaesti naučno-stručni skup sa međunarodnim učešćem „Planska i normativna zaštita prostora i životne sredine" teži da nastavljajući tradiciju dugu više od dvadeset godina, okupi naučnu i stručnu javnost iz oblasti prostornog i urbanističkog planiranja i zaštite životne sredine, a ovoga puta i energetskog i sektora turizma.

Namera organizatora je da se pokretanjem aktuelnih tema i diskusija između naučne i stručne javnosti, dođe do kvalitetnih zaključaka koji se mogu primeniti u daljim istraživanjima, ali i da imaju praktičnu primenu u planiranju i zaštiti prostora i životne sredine. Ono što pruža dodatni podstrek organizatoru je nesmanjeno interesovanje autora radova da se čuje i razgovara o izazovima i problemima sa kojima se struka, ali i društvo uopšte, susreće poslednjih godina.

Ovog puta glavna tema skupa je planiranje energetskih sistema a poseban akcenat je stavljen na predstojeću reformu energetskog sektora i sprovođenje procesa energetske tranzicije. Ključne odrednice su dekarbonizacija energetskog sektora, veće korišćenje obnovljivih izvora energije i intenzivnija primena mera energetske efikasnosti što će ostaviti određene implikacije na prostorni razvoj.

Osim teme energetskog razvoja u zborniku je pažnja posvećena uvođenju i primeni savremenih tehnologija i inovativnih rešenja u planiranju i zaštiti prostora. Pored toga fokus je vraćen i na rastući trend korišćenja prostora zaštićenih prirodnih i kulturnih dobara kao okosnice turizma i razvoja privrede koji zahteva drugačiji pristup planiranju i zaštiti ovih prostora u skladu sa principima održivog razvoja i zaštite neobnovljivih resursa.

Primere dobre prakse predstavio je značajan broj autora dajući doprinos kvalitetu zbornika i relevantnosti zaključaka skupa. Zato verujemo da će zbornik radova doprineti boljem razumevanju pojedinih pitanja ili nedoumica, otvoriti prostor za širu naučnu i stručnu diskusiju i biti dobar osnov za produbljivanje tema na sličnim skupovima, tribinama i radionicama u narednom periodu.

Imajući u vidu aktuelnost ovih tema i širok dijapazon naučnih i stručnih pristupa rešavanju problema, uz tradicionalno razmatranje tema koje se odnose na pravni, metodološki i institucionalni okvir zaštite prostora i životne sredine, ovaj skup predstavlja priliku da se jednom mestu razmene naučna i stručna iskustva iz Srbije i inostranstva i unapredi metodologija planiranja i zaštite prostora i životne sredine.

Zbornik radova koji je pred vama sadrži 49 radova na čijoj izradi je učestvovalo blizu 130 autora koji će uz diskusiju sa ostalim učesnicima skupa otvoriti brojna pitanja ukazujući na probleme ali i nudeći rešenja, a čitaocu zbornika mogućnost da uporedi pristupe i dođe do sopstvenih zaključaka o mogućnosti njihove primene. Naravno, svima je cilj da se na skupu dođe do realnih i kvalitetnih zaključaka kako bi se unapredila teorija ali i praksa planiranja, korišćenja i zaštite prostora i životne sredine.

Univerzitet u Beogradu - Geografski fakultet i Asocijacija prostornih planera Srbije se zahvaljuju domaćinu skupa - gradu Novom Pazaru na kolegijalnosti, pomoći i podršci u organizaciji ovog događaja. Istovremeno, sa posebnim zadovoljstvom se zahvaljujemo svim autorima, koji su i ove godine dali nemerljiv doprinos uspešnosti skupa i kvalitetu zbornika.

Urednici

DEVELOPMENT METHODS AND PRINCIPLES FOR PLANNING CENTRAL ACTIVITIES – METHOD FOR MEASURING CENTRTALITY FOR SUSTAINABLE DEVELOPMENT AND INTEGRATIVE PLACES

Tatjana Mrđenović[1]

Abstract: The study investigates the possibility of enhancing the technique for estimating the level of development of central activities, both general and specialised, at the settlement level in order to improve planning solutions for sustainability. The conceptual framework reflects sustainable development and integrative planning, as described by UN charters, within which improvements to the modernist and functionalist approaches to the philosophy of planning central activities are examined and offered. The lack of a qualitative determination of the functionalist theory's importance in the field of sustainability is a flaw of the method of assessing its centrality. As a result, the author proposes an improved, integrative model for determining the state and level of development of central activities, which is based on existing theories and their improvement with qualitative determinations of territory integrability, using GIS as a tool in the process of creating a planning solution for the development of central activities for the needs of Amendments and Supplements to the PPO Pecinci. The research will focus on centrality as one of the features of the centres, and will give recommendations for improving the model of its assessment and development using the example of the PPO Pecinci amendment. In this case, centrality was defined and measured using theoretical models, resulting in a specific method for cases where it is possible to measure concentration but data on capital turnover, i.e. the level of frequency of use of a specific point of concentration, are unavailable or impossible to establish. The precision of this approach is directly related to the accuracy of determining the concentration of the central spot, and it is further characterized by the weights allocated to certain indicators in respect to the qualitative criteria.

Key words: sustainable development, central activities, centrality, spatial planning

METODE RAZVOJA I PRINCIPI ZA PLANIRANjE CENTRALNIH AKTIVNOSTI – METODA ZA MERENjE CENTRALITETA INTEGRATIVNIH MESTA

Apstrakt: Rad istražuje mogućnosti unapređenja metodologije utvrđivanja nivoa razvijenosti centralnih aktivnosti kako opštih, tako i specijalizovanih na nivou naselja, a u svrhu unapređenja planskih rešenja ka održivosti. Konceptualni okvir istraživanja predstavlja održivi razvoj i integrativno planiranje, kako je definisano poveljama UN-a, u okviru kojeg se diskutuje i predlažu unapređenja modernističkog i funkcionalističkog pristupa teorije

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planiranja centralnih aktivnosti. Manjkavost metoda merenja centraliteta funkcionalističke teorije je u odsustvu njegovog kvalitativnog određenja u polju održivosti. Stoga, autor predlaže unapređeni, integrativni model za utvrđivanje stanja i nivoa razvijenosti centralnih aktivnosti, koji se bazira na postojećim teorijama i njihovom unapređenju kvalitativnim određenjima integrativnosti teritorije, koristeći GIS kao alat u procesu kreiranja planskog rešenja razvoja centralnih aktivnosti za potrebe Izmena i dopuna PPO Pećinci. Rad će u fokus istraživanja postaviti centralitet, kao jednu od karakteristika centara i dati smernice za unapređenje modela njegovog merenja i razvoja na primeru izrade Izmena i dopuna PPO Pećinci. U konkretnom slučaju, centralitet se definisao i merio u skladu sa teorijskim modelima, formirajući specifičan metod za za slučajeve kad je moguće izmeriti koncentraciju, dok su podaci koji se odnose na obrt kapitala odnosno nivo frekventnosti korišćenja određenog centralnog mesta nedostupni ili ih je nemoguće ustanoviti. Nivo preciznosti ovog metoda je u direktno proporcionalan preciznošću ustanovljenja koncentraciji centralnog mesta, i dodefinisan je ponderima koji su dodeljeni određenim indikatorima u relaciji sa kvalitativnim kriterijumima.

Ključne reči: održivi razvoj, centralne aktivnosti, centralitet, prostorno planiranje

INTRODUCTION

Castells states that global and network (informatics) society considers the constant and rapid flow of capital on the global market and traffic-technological networking at all spatial levels, from global to local, when planning and managing central activities. Castells' network society states that a place's identity and specificity are shaped by the dominance of a specific group of global capital and the desire to attract it. This involves evaluating the accessibility and appeal of directed global, regional, or national capital to a specific time and place, specifically the municipality of Pećinci.

The global entertainment industry shapes many activities. It has driven the transition from agricultural to industrial and commercial societies throughout history. Today, we live in an entertainment society where appeal and experiences shape settlement development, profitability, attractiveness, and centrality. Integrating all sustainable development dimensions into central activity development is best.

Central activities, whether public or private, that meet needs or interests concentrate and contribute to the urbanity of an area, defining it more towards administrative, commercial, production, sports-recreational, or tourist areas that, with their planning solutions, must maximise capital, people, goods, and services turnover.

Key activities, including public services, are increasingly tied to private capital, so their growth is cooperatively planned based on local needs and interests. Needs provide work and housing, while interests provide capital turnover and commercialization. Many public sector functions, including social standard facilities like kindergartens, gymnasiums, faculties, universities, health centres, and cultural facilities, are delegated or taken over by the private sector, so their space distribution must be standardised, especially as the population migrates to larger and more attractive centres.

Sustainable development, defined by UN charters, drives global capital and the demands for cheap labour, quick profits, and the realisation of interests. It emphasises developing a network of cities and towns with a specific identity and diversifying authentic resources and potentials like movable and immovable cultural assets, natural resources, and a place's investment potential.

PRINCIPLES FOR SUSTAINABLE DEVELOPMENT OF CENTRAL ACTIVITIES

The Municipality of Pećinci's Central Activity Development Plan includes multiple principles for a specific timeframe:

a. Integrated, sustained development of central activities;
b. The idea of meeting key activity needs and interests in real time and space;
c. Central activity management and strategic planning.

a. Integrated, sustained development of central activities;

Policy and planning usually link urban sustainability and development. Most is domestic urban planning. This is supported by socialist and post-socialist urban planning. Territory function development informs urban planning decisions, goals, values, and needs. In a market-oriented economy, plural, open, and dynamic central activity planning addresses these issues. Plan should protect and define the public interest, which includes not only meeting needs but also the common, consensual determination of the public, private, and civil sectors to strategic determinants of territory development and the sustainable transfer of renewable and non-renewable resources. The plan guides variable, development resource, and potential growth and improvement.

In the Venn diagram of sustainable development, one sector of a territory must grow positively or negatively with another. Thus, business and production systems must be compatible with natural resource preservation, cultural and historical heritage, and population retention and attraction to meet daily, weekly, and monthly needs. Sustainable modernity corrects the "mistakes" of functionalist territory development by developing and planning all central activities, from public services to primary and secondary production (manufacturing and industry) to commercial, business, and tourism trade.

Integrated development is at the intersection of all three (or four) territorial development sets, so we must consider other perspectives when designing the territory. A business-production system must consider ecological factors, integrate them according to green economy principles, and actively involve and employ locals and the public sector. Standardising traditional activities like hunting in Pećinci is essential for national and global public good recognition.

The public must agree on public interest or value through creative milieu and open dialogue. Integration allows systemic development component control for sustainability. Develop all four areas of sustainability with guidance. Interconnecting sectors and management levels creates a networked administration. It coordinates local, national, and transnational plans and actions. To make sustainable development decisions, integral planning integrates disciplines, interests, decision-makers, management levels, and planning traditions.

b. Real-time and spatial realisation of central activity demands and interests

We followed prof. Dr. P. Badovinac's doctoral dissertation and book Urban Functions of Centres' definitions and indicators. Although mostly determined by needs in relation to the functionalist approach to determining the center's spatial distribution, structure, and scope, this principle will guide its development.

Definition of central function. Central functions include all activities in various spatial forms to show how social demands affect urban form. When classified by satisfaction and spatial organisation based on their social needs, we have three basic groups with several subgroups of different activities.

The frequency of population, user, and investor needs and interests determines centre classification. It divides centres into general centres, where the gravity area represents the activities that meet the majority of the population's needs, and specialised centres. Labour and capital-intensive, functionally separated activities are in specialised centres, while general centres aggregate communication-intensive content and are open to all.

The gravity area circumference inversely affects need satisfaction. Since most daily needs are met in lower-level homes, pedestrian accessibility defines the gravitational region. Complex traffic raises periodic demands' gravity.

BASIC STRUCTURAL INDICATORS

The optimal functional organisation of a centre within the system of territorial centres can be measured by its internal organisation, which includes human needs and interests, locational requirements of central activities, space and urban continuity, and its relational relationship with the surrounding environment and other centres.

The optimal spatial organisation of a centre depends on its functional space, its ability to be transformed in relation to the dynamics of expected changes during exploitation, its rationality, the rationality of its construction, arrangement, furnishing, and use costs, and its attractiveness.

The city centre system is open and dynamic, and its interactions are determined by important spaces and their users. Each central site has unique qualities, but a few fundamental traits are used to categorise and position them in the system of centres:

☐ Concentration

Central contents of a territorial organisation must be concentrated in one city area to identify its centre. The ratio of central activity area to city centre place area shows how concentrated central activities are. The concentration coefficient K measures local central activity. The concentration coefficient (K) is calculated by comparing the built-up surface area of buildings with central facilities in the remote centre or central zone to the total area of all such buildings or plots in the city: K=∑BRGP centre and / BRGP centre of the territory. Concentration coefficient is 0–1:

1. 0.50<K>1.00 – major centre
2. 0.30<K>0.50 – higher centre level.
3. (0.10<K>0.30) - middle centre level
4. 0.05<K>0.15 – lower centre level.

☐ Accessibility

Accessibility to the centre limits communication options. Several quantitative methods for determining a location's isoaccessibility field use different criteria to find the critical path. The center's organisation must provide internal and external accessibility. The main factors are parking and pedestrian access. It measures all types of traffic connecting the centre to the gravity region or spatial accessibility to centre activities.

☐ Centrality

According to Badovinac , centrality describes the observed center's relational interaction with the environment, its functional relationships in the network of centres, and its

links to other environmental functions (Badovinac, Centralne urbane funkcije - CENTRI, 1997). Numerous numerical methods determine centrality. The analytical assessment of each settlement's centrality chapter introduces a new method for assessing centre level and type in this plan.

□ Centre appeal—location identity and brand

Functional appeal is determined by key activity organisation, capability, and local accessibility. Functional attractiveness, spatial-physical features, and quality of the centrality's environment determine its appeal. The center's centrality and accessibility over time and place determine its quantitative functional appeal. Total attractiveness is qualitative, not quantitative. Environment quality, cultural and historical values, architectural and design characteristics, etc., which can be quantified, may indirectly convey it. Centrality is the qualitative signal that distinguishes an integrated place's identity.

c. Central activity management and strategic planning

The market economy, global, and network society plan for risk and uncertainty, especially in central activity planning and management, which market processes regulate. Risk management can be calculated and a range of options defined in relation to market conditions, but planning in uncertain conditions cannot be predicted and calculated because not only is the behaviour of the variables unknown (in the case of territorial development, subjects-stakeholders), but both cases plan central activities using an open planning principle rather than a strictly determined approach.

The global and network society highlights new risks associated with rapid capital mobility and speed when better investment conditions are formed. Sustainable and integral development mitigates the negative effects of globalisation, such as weaker markets and communities closing markets and losing the chance to benefit from global capital and join the global network of cities and settlements, which become regional and national development carriers. Sustainable development strategically plans and manages territorial development.

The strategic approach sets the framework for territorial development based on feasible general development objectives determined by natural and artificial conditions and local or regional community needs and interests. Strategic planning is a process of making sustainable decisions that consider the interests of the private, public, and civil sectors, defines risk management strategies and options, and redefines options to respond to new market conditions when the uncertain situation becomes risky. Strategic, integrative decision-making in planning, especially with key activities, creates stages with different routes depending on the scenario.

MEASURING CENTRALITY IN INTEGRATIVE MANNER – TOWARDS INTEGRAL CENTRES

Centrality was defined and measured for the purposes of creating the PPO Pećinci in accordance with theoretical models, forming a specific method for its measurement for cases when it is possible to measure concentration, while data related to capital turnover, i.e. the level of frequency of use of a certain central place is unavailable or impossible to establish. The level of precision of this method is directly proportional to the concentration of the central place, and is defined by the weights assigned to certain indicators in relation to two criterion: (1) Development of the general center and (2) Development of the specialized centres. The method uses GIS and RGZ as a tool and a source of data.

The formula for calculating the level of centrality especially for the general and especially for the specialized center according to this method is:

$$C(o) = K * (o + a + b + c + d + e)$$

$$C(s) = K * (f + g + h + I + j + k)$$

Where C(o) is the centrality of the general center which is calculated as the sum of the development weights of the general center multiplied by the concentration of the overall center, while C(s) is the centrality of the specialized center which is calculated as the sum of the development weights of the specialized center multiplied by the concentration of the overall center.In this way, special values are obtained for the centrality of the general center and the centrality of the specialized center, which can further be used to measure the level and type of centrality, as shown in the formulas below, where C(n) represents the level of centrality, and C(v) type of centrality.

$$C(n) = C(o)+C(s)$$

$$C(v) = C(o)/C(s)$$

The type of centrality defines its dominant character, i.e. whether it is characterized mainly by administration, culture, public services, etc. or business and trade, or else it is balanced-integral. In this context, three types of centrality can be distinguished:

- SOCIALIZABLE C(v) >1,
- ECONOMIC C(v) < 1,
- INTEGRAL C(v) = ~1

Table 1. Criteria and indicators for defining the type of centrality:

criterion	1	**Development of the general center**
indicator	o	**Number of general centers**
	a	**Number of services of the general center at the settlement level**
	b	**The type of services of the general center at the settlement level** is weighted in relation to diversity, that is, in relation to the number of different activities and contents
	c	**The level of their mutual networking.** Is measured by the level of connectivity in accordance with the theory of spatial syntax (con 1 - one connection, con 2 - two connections, con 3 - three connections, con 4 - four connections, con 5 - five or more connections)
	d	**Activity level.** is measured by the ratio of the area of the property type P/J, P – private, J – public. This indicator is important because it represents the participation of the private sector in central activities that in a market economy should be left to the dominant private sector or in a public-private partnership, either in relation to public services or the commercial sector. On the other hand, activities such as culture, health and social protection are still dominant in the public sector. In this context, this indicator also determines the level of activity of the center.

criterion	2	**Development of specialized centers:**
indicator	f	**Number of specialized centers**
	g	**A type of specialized centers.**
	i	**The level of their mutual networking.** It is measured by the level of connectivity in accordance with the theory of spatial syntax (con 1 - one connection, con 2 - two connections, con 3 - three connections, con 4 - four connections, con 5 - five or more connections)
	j	**Activity level.** is measured by the ratio of the area of the property type P/J, P – private, J – public. This indicator is important because it represents the participation of the private sector in central activities that in a market economy should be left to the dominant private sector or in a public-private partnership, either in relation to public services or the commercial sector. On the other hand, activities such as culture, health and social protection are still dominant in the public sector. In this context, this indicator also determines the level of activity of the center.

The GIS analysis of settlements in municipality of Pecinci showed that all of them have ECONOMIC centres for which the Plan for development of central activities gave guidelines for their qualitative and quantitive improvements towards sociable and integral centres (Table 1, Table 2).

Table 2. Assessment of the level of development and type of centrality at the level of the settlement of Prhovo in Municipality of Pecinci

PRHOVO SETTLEMENT PRESENT K = 0.0309, K(o) = 0.009, K(s) = 0.03, C(v) = 0.33 ECONOMICAL PLAN K = 0.05-0.15, C(v) INTEGRATIVE		
критеријум	1	**Development of the general center:**
C(o) = K(o) * (o+a +b + c+ d+ e)		**C(o) = 0.02**
C(s) = K(s) * (a +b + c+ d+ e)		**C(s) = 0.06**
C(n) = C(o) + C(s)		**C(n) = 0.08**
C(v) = C(o) / C(s)		**C(v) = 0.33 ЕКОНОМСКИ**
Introducing new content		HOSPITALITY, SHOPS, CULTURAL AND EDUCATIONAL DISPERSAL CENTER, ENTERTAINMENT, CRAFTS, ADMINISTRATION, BUSINESS CENTERS, NURSING FACILITIES
Introduction of new centers		Development of specialized centers: NEW BUSINESS-PRODUCTION LINE CENTERS, TOURIST-ACCOMMODATION CENTER, ENTERTAINMENT-CULTURAL CENTER, ETHNO VILLAGES

The Plan for development of integrated centres in settlements of Municipality of Pecinci follow implementation of all three overall strategies of centres development: STRATEGY 1: Formation of the identity of each settlement - dispersive / punctual development of the centrality of each settlement, STRATEGY 2: Connection flows of settlements - development of a ring network of settlements, STRATEGY 3: Connection belts of settlements - development of specific zones of the municipality.

CONCLUSIONS

The optimal spatial organisation of a centre depends on its functional space, its ability to be transformed in relation to the dynamics of expected changes during exploitation, its rationality, the rationality of its construction, arrangement, furnishing, and use costs, and its attractiveness. The city centre system is open and dynamic, and its interactions are determined by important spaces and their users. Each central site has unique qualities, but a few fundamental traits are used to categorise and position them in the system of centres: Concentration, Accessibility, Centrality, Centre Appel. This research focused on Centrality as a property that has potential to improve places and settlements towards sustainable ones. Therefore the new method for measuring centrality is introduced which distinguish centres into several types.

The type of centrality defines its dominant character, i.e. whether it is characterized mainly by administration, culture, public services, etc. or business and trade, or else it is balanced-integral. In this context, three types of centrality can be distinguished:

- SOCIALIZABLE C(v) >1,
- ECONOMIC C(v) < 1,
- INTEGRAL C(v) = ~1

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