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DOCUMENT OF THE COMMON FUNCTIONAL AREAS INTEGRATED ENVIRONMENT MANAGEMENT STRATEGY (FAIEMS)

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A. Table of content

B. The objective

The objective of the Activity A.T1.2 Methodology of specific integrated FUA plans enhancing urban and peri-urban coherence basing on the gained experience and Activity A.T1.5 Common strategy for integrated environmental management of urban/peri-urban relationships the output of which is this Deliverable D.T1.5.1. Document of the common Functional Areas Integrated Environmental Management Strategy (FAIEMS) has been to create the **common understanding and methodology frameworks for the development of strategies, plans and instruments of comprehensive management dedicated to sustainable development and environment embedded into the integrative land management in FUAs.**

The conceptual approach has been based on:

- Integrated urban development in the functional urban areas (FUAs) as a tool for optimization of land-use management and its synergy with the concept of ecosystem services as well as management of cooperation of the city core and its suburban areas including institutional framework and
- Potential of multilevel polycentric governance as a core concept for efficient institutional framework in the field of land use and soil management.

As a result of the knowledge gained and on the partners' experience the common strategy has been developed of FUAs integrated environment management. The aim was to help to elaborate specific documents addressed to various types of urban and peri-urban relationships.

LUMAT extends the area of study to the functional urban area level and to the development of strategies and tools made for transnational use:

- PLANNING: European Standard for Land Information and Balances in regional plans (CEN-Agreement); Evaluation tools for land portfolios, calculating follow-up cost in strategic development plans;
- MANAGEMENT MODEL: creation of land agencies, revolving financing model, impact compensation model.

This document represents a transnational concept of a common strategy for integrated environment management of FUA development including the urban/peri-urban relationship in FUAs in the component of land and soil as environmental resources. It is as a result of training and identification and prioritization of common problems.

C. Common Understanding of Integrated Management of FUAs` development

C.1. Framing ideas

C.1.1 Problem definition

Today's urban agglomerations are exposed to rapid urban growth, leading **to increasingly complex and unsustainable environments**, which impact human health, well-being and ecological quality (UN-HABITAT, 2009). Cities and human settlements face unprecedented **threats** from unsustainable **consumption** and production patterns, loss of biodiversity**, pressure on ecosystems**, pollution, and **natural and man-made disasters**, and **climate change** and its related **risks**, undermining the efforts to end poverty in all its forms and dimensions and to achieve sustainable development. Given cities' demographic trends and their central role in the global economy in the mitigation and adaptation efforts related to climate change and in the use of resources and ecosystems, the way they are planned, financed, developed, built, governed, and managed has a direct impact on sustainability and resilience well beyond the urban boundaries (New Urban agenda, UN-HABIATAT, 2016).

Although the FUAs as defined by the EC and OECD **have not found broader positive respond** being defined based on **very formal normative concept not reflecting the complexity of urban/peri-urban interrelations and not able to address real problems of environmental management including the land and soil management and the treats between different demands on the use of resources incl. the space.**

From the point of view of environmental management, the urban/peri-urban interface has several implications for its analytical part as well as for planning and policy interventions:

- The carrying capacity of the territory (soil productivity, vulnerability to floods, availability of drinking water, etc.) needs to be mirrored by a set of more appropriate criteria for the environmental assessment of the peri-urban interface than the conventional zoning criteria based on density, morphology and urban and rural uses of the territory.
- Conventional urban planning has favoured a centrifugal view inadequate for addressing the characteristics of the interface's "patchwork" structure. Through trade and natural flows of ecological goods and services, cities tend to draw on the material resources and ecological productivity of vast hinterlands.
- The expansion of cities' ecological footprints has important implications for the peri-urban interface in terms of both increasing pressures on its carrying capacity and missing production opportunities, for instance when food is imported from distant regions rather than supplied from the city's hinterland. (7)

- From a socioeconomic viewpoint, uneven process of urbanization taking place in these areas is generally accompanied by land speculation, shifting economic activities of higher productivity, intensive use of agro-chemicals and fertilizers, mining or quarrying activities for the supply of building materials, social groups are heterogeneous and in constant transition. That is to say, the composition and interests of these groups tend to change over time, in a process characterized by the fluctuating incorporation of new stakeholders. As a result, it is difficult to establish clear and more or less permanent institutional arrangements that deal effectively with the long- term management of natural resources and the enhancement of the livelihoods of those living and working in the peri-urban interface. This point is discussed in more detail below.

- The peri-urban interface is often characterized as the converging of sectoral and overlapping institutions with different spatial and physical remits. This is related to the changing geographical location of the peri- urban interface or of the process whereby institutional arrangements or areas of responsibility tend to be too small or too large, too urban or too rural in their orientation to address sustainability and poverty concerns effectively. (9)

- Private sector bodies as well as non- governmental and community-based organizations also intervene in the management of peri-urban areas, but often without clear articulation or leadership from government structures. The problem of institutional fragmentation is particularly relevant for understanding the constraints faced in environmental planning and management within this interface.

- Peri-urban areas often share the territory of more than one administrative unit. Weak links and limited municipal power in the sectors such as transport, water, energy, solid and liquid waste management, and land-use planning often result in uncertainty as to which institution administers which specific area or activity. (10) No district is able to apply a single isolated approach when supplying the comprehensive water and energy flows required by its population, or to manage the wastes and pollution generated by that population within its jurisdictional limits. This discussion implies that environmental planning and management of this interface demands a conceptual and methodological shift from the physical definition of urban and rural areas (understood as clearly limited geographic and administrative entities) to a broader understanding, whereby the complex patterns of settlement and resource use, the flow of natural resources, of capital, goods, services and people, do not fit or accord with jurisdictional boundaries. (11)

C.1.2. Political responses

The most recent political responses are represented by New Urban Agenda adopted in Quito in the autumn 2016 (New Urban Agenda, UN-HABIATAT, 2016):

- To use the **capacities of the cities fulfilling their territorial functions across administrative boundaries**, and act as hubs and drivers for balanced sustainable and integrated urban and territorial development at all levels (New Urban agenda, UN-HABIATAT, 2016).

- To support **territorial systems that integrate urban and rural functions** promoting sustainable management and use of natural resources and land, ensuring reliable supply and value chains that connect urban and rural supply and demand to foster equitable regional development across the urban-rural continuum and fill the social, economic, and territorial gaps
- To promote the **development of urban spatial frameworks, including urban planning and design instruments that support sustainable management and use of natural resources and land,** appropriate compactness and density, polycentrism, and mixed uses, through infill or planned urban extension strategies as applicable, to trigger economies of scale and agglomeration, strengthen food system planning, enhance resource efficiency, urban resilience, and environmental sustainability.
- To develop **spatial development strategies that take into account, as appropriate, the need to guide urban extension prioritizing urban renewal** by planning for the provision of accessible and well-connected infrastructure and services, sustainable population densities, and compact design and **integration of new neighbourhoods in the urban fabric, preventing urban sprawl and marginalization.**
- To facilitate the **sustainable management of natural resources** in cities and human settlements in a manner **that protects and improves the urban ecosystem and environmental services,** reduces greenhouse gas emissions and air pollution, and promotes disaster risk reduction and management, through supporting the development of disaster risk reduction strategies and periodical assessments of disaster risk caused by natural and man-made hazards, including standards for risk levels, while fostering sustainable economic development and all persons' well-being and quality of life, through environmentally sound urban and territorial planning, infrastructure, and basic services.
- To adopt a **smart city approach**, which makes use of opportunities from digitalization, clean energy and technologies, as well as innovative transport technologies, thus providing options for inhabitants **to make more environmentally friendly choices and boost sustainable economic growth and enabling cities to improve their service delivery**.
- To **create and maintain of well-connected and well-distributed networks of open, multi-purpose, safe, inclusive, accessible, green, and quality public spaces** to improve the resilience of cities to disasters and climate change, reducing flood and drought risks and heat waves, improving food security and nutrition, physical and mental health, household and ambient air quality, reducing noise, and promoting attractive and liveable cities and human settlements and urban landscapes, prioritizing the conservation of endemic species.
- To preserve and **promote the ecological and social function of land** and foster ecosystem-based solutions to ensure sustainable consumption and production patterns; so that the ecosystem's regenerative capacity is not exceeded. We also commit to promote sustainable land use, combining urban extensions with

adequate densities and compactness preventing and containing urban sprawl, as well as preventing unnecessary land use change and the loss of productive land and fragile and important ecosystems.

- **To launch sustainable management of resources** — including land, water (oceans, seas, and freshwater), energy, materials, forests, and food, with particular attention to the environmentally sound management and minimization of all waste, hazardous chemicals, including air and short-lived climate pollutants, greenhouse gases, and noise — in a way that considers urban-rural linkages and functional supply and value chains vis-à-vis environmental impact and sustainability, and strives to transition to a circular economy, while facilitating ecosystem conservation, regeneration, restoration and resilience in the face of new and emerging challenges.
- **To implement long-term urban and territorial planning processes and spatial development practices** that incorporate integrated water resources planning and management, considering the urban-rural continuum at the local and territorial scales, and including the participation of relevant stakeholders and communities.
- **To implement environmentally sound waste management and to substantially reduce waste generation** by reducing, re-using, and recycling (3Rs) of waste, minimizing landfills, and converting waste to energy when waste cannot be recycled or when it delivers the best environmental outcome. We further commit to reduce marine pollution through improved waste and waste water management in coastal areas.
- To develop **sustainable, renewable, and affordable energy**, energy-efficient buildings and construction modes, and to promote energy conservation and efficiency, which are essential to enable the reduction of greenhouse gas and black carbon emissions, ensure sustainable consumption and production patterns, and help to create new decent jobs, improve public health, and reduce the costs of energy supply.
- To **strengthen the resilience of cities and human settlements, including through the development of quality infrastructure and spatial planning by adopting and implementing integrated, age- and gender-responsive policies and plans and ecosystem-based approaches**
- To **develop the infrastructure** that is resilient, resource- efficient, and which will reduce the risks and the impact of disasters, including the rehabilitation and upgrading of slums and informal settlements.
- To **shift from reactive to more proactive risk-based, all-hazards and all-of-society approaches**, such as raising public awareness of the risk and promoting ex-ante investments to prevent risks and build resilience, while also ensuring timely and effective local responses, to address the immediate needs of inhabitants affected by natural and man-made disasters, and conflicts. This should include the integration of the ‘’Build Back Better’’ principles in the post-disaster recovery

process to integrate resilience- building, environmental and spatial measures, and the lessons from past disasters and new risks into future planning.

- To **promote climate action**, including climate change adaptation and mitigation, and to support cities and human settlements, their inhabitants and all local stakeholders to be important implementers.
- To support **the medium- to long-term adaptation planning process**, as well as city-level climate vulnerability and impact assessments to inform adaptation plans, policies, programmes, and actions that build resilience of urban inhabitants, including through the use of ecosystem-based adaptation.
- To implement **sustainable urban and territorial planning, including city-region and metropolitan plans, to encourage synergies and interactions among urban areas of all sizes, and their peri- urban, and rural surroundings**, including those that are cross-border, and support the development of sustainable regional infrastructure projects that stimulate sustainable economic productivity, promoting equitable growth of regions across the urban-rural continuum. In this regard we will promote urban-rural partnerships and inter-municipal cooperation mechanisms based on functional territories and urban areas as effective instruments to perform municipal and metropolitan administrative tasks, deliver public services, and promote both local and regional development.
- To **prioritize renewal, regeneration, and retrofitting of urban areas,** as appropriate, including upgrading of slums and informal settlements, providing high-quality buildings and public spaces, promoting integrated and participatory approaches involving all relevant stakeholders and inhabitants, avoiding spatial and socio-economic segregation and gentrification, while preserving cultural heritage and preventing and containing urban sprawl.
- To **integrate urban and territorial planning** based on the principles of **equitable, efficient, and sustainable use of land and natural resources, compactness, polycentrism, appropriate density and connectivity, multiple use of space**, as well as mixed social and economic uses in the built-up areas, to prevent urban sprawl, to reduce mobility challenges and needs and service delivery costs per capita, and to harness density and economies of scale and agglomeration, as appropriate.

D. The outline of the concept for common integrated functional urban areas` environment management

D.1. The FUAs as the natural functional spatial units and objects of integrated environment management

Necessary **reflection of the complexity of urban/peri-urban interrelations and need to address real problems of environmental management** including the land and soil management and **the treats between different demands on use of resources** (the land incl.) **overstepping the borders of the cities in their administrative borders** creates the background for the development of the **concepts of common management of spatial development. This concept addresses the space of the core cities and their peri-urban areas to which the complex activities of the city life radiates creating intensive functional ties.**

The LUMAT Project focuses on the development of **the concept for the management of sustainable environment management with the stress on cohesion of environmental, social and economic aspects as integrative comprehensive model of multilevel governance for the core cities and their peri-urban spaces creating functional urban areas**. The basic theoretical concept of functional areas is defined on the principles of real functional ties between urban core area and its gravitation area represents the model of peri-urban interface. This mirrors the fact that there is growing recognition among professionals and institutions that rural and urban features tend increasingly to co-exist within cities and beyond their formal administrative boarders.

Using already **broadly known terminology the LUMAT project reflects the concept of FUAs as defined jointly by the OECD and European Commission** (The methodology for the identification of the FUAs based on this definition was approved by the OECD Working Party on Territorial Indicators in 2011 and consequently applied to 29 OECD countries). The FUAs in accordance with this definition represent "functional economic units" choosing as building blocks for the functional urban areas smallest administrative units for which national commuting data are available (LAU2 in Eurostat terminology). Each functional urban area in the definition of the OECD and EC is understood as an economic unit characterised by densely inhabited "city core" and "commuting zone" whose labour market is highly integrated with the cores.

The geographic building blocks to define urban areas are the municipalities (e.g. LAU2 in European countries). The city cores are defined using the population grid from the global dataset Landscan, referred to circa year 2000. Polycentric cores and the hinterlands of the functional areas are identified on the basis of commuting data (travel from home-to-work) referred to circa year 2000 (Census year). The definition of functional urban areas made by OECD and EC uses population density to identify urban cores and travel-to-work flows to identify the hinterlands whose labour market is highly integrated with the cores. The methodology consists of three main steps: identification of core municipalities through gridded population data, connecting non-contiguous cores belonging to the same functional urban area and identification of the urban hinterlands. The methodology makes it possible to compare functional urban areas of similar size across countries.

As the analyses under the previous activities have shown (see the deliverable A.T1.1), the definition by the OECD and EC and identification based on this definition in many countries does not reflect reality of the organisation of polycentric settlement structure as they are based only on limited criteria not mirroring real centrifugal interrelationships between core city and its functional area. This shows in addition to other facts the list of functional

urban areas taking into account the results of the consultation with the European National Statistical Institutes launched by Eurostat in June 2011 on the definition of cities.

Although this list of functional urban areas should be reviewed on the basis of additional comments provided by countries, the difference between real urban functional areas and areas defined by the OECD and EC shows too big gaps, which cannot be covered by simple corrections, especially if the Functional Urban Areas, as labour market basins, are perceived as the key drivers of European, national, regional and local economic performance and important territorial structures in delivering on the Europe 2020 targets.

The concept for common functional urban areas management in the project LUMAT is based on **innovative approaches in the planning systems** including multilevel polycentric governance reflecting the fact, that **the urban-rural dichotomy deeply ingrained in current planning systems is inadequate for dealing with processes of environmental and developmental change in the peri-urban context and the fact that there are already proper models in Europe offering suitable institutional environment for introduction and optimisation of integrated environment management in urban-peri-urban areas.**

Europe is characterised by a polycentric network in which the FUAs as defined by the OECD and EC are only part of its structure. Reflecting the diversity and density of the European urban system, different size of the core cities and urban areas and broader scale of functions the FUAs in majority of the EU member states have not became the real instrument of the national spatial development strategies, although often used as the framework for the definition of the target areas for the investments form the European Structural and Investment Funds in the programming period 2014/2020. Functional urban areas defined based on proper definition and used as the instrument for spatial development management can be important territorial assets for Europe because they can frame for integrated approaches in the cities and their suburbs representing critical mass for development, strengthening urban-rural linkages and encouraging cooperation between cities belonging to a cross-border area, macro-region or even a global integration zone.

Inherent part of the development of the common integrated environment management model and strategy is to look for the roots of spatial integration. These roots are represented by FUA identity. That because one of important tasks of the LUMAT project was mapping different approaches and development of an integrative approach to the identification of FUA identity with the goal to frame the development and implementation of joint integrated FUA environment management including the strategy.

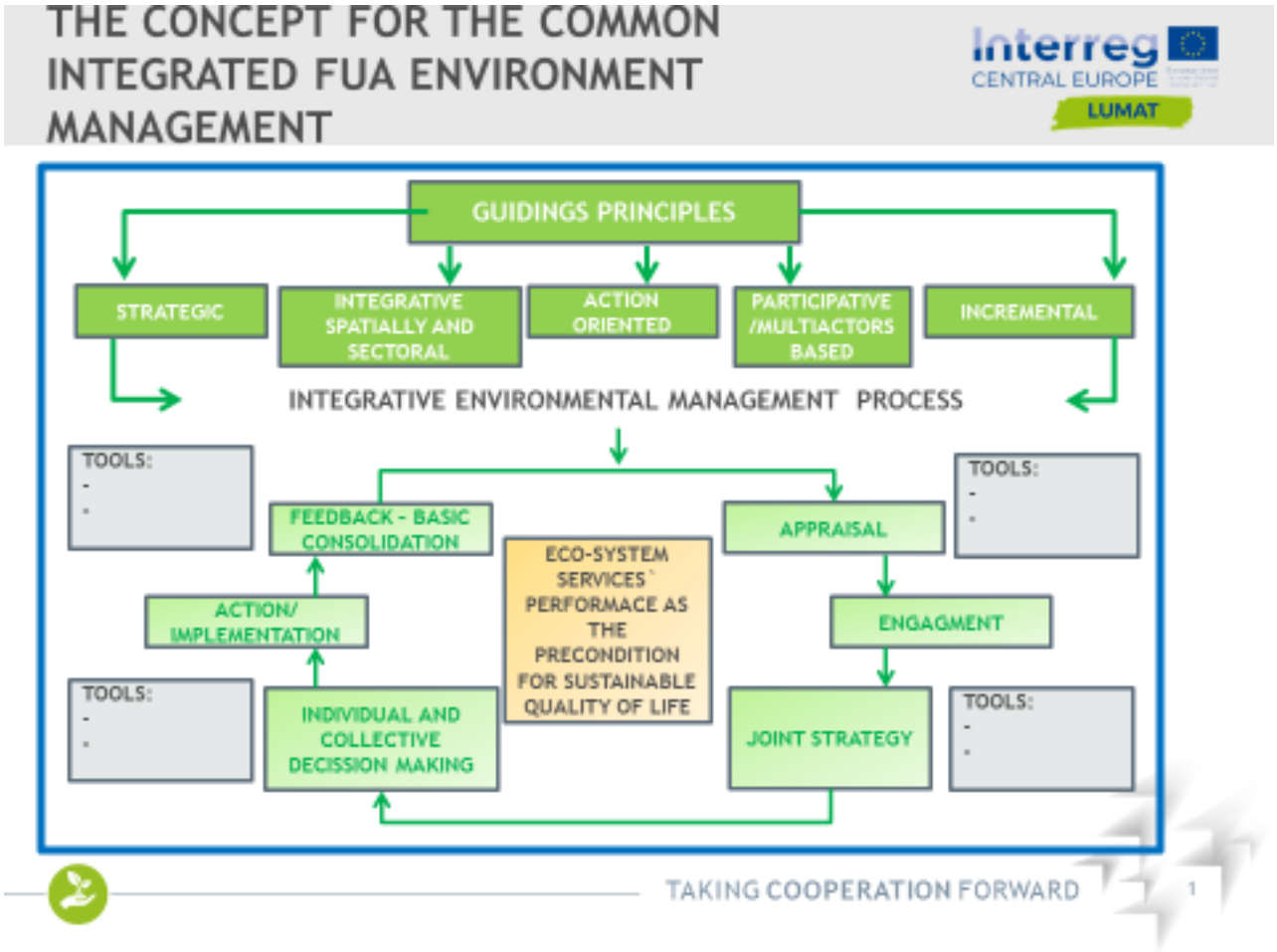
The LUMAT concept of integrated FUAs environment management is based on the concept of functional urban areas as the functional territorial units defined based on analyses of natural ties of interdependences and collaboration between core city and municipalities in the peri-urban areas institutionalised or based on national policies implementation (including adopting the OECD methodology) (top-down approach) or based on collaboration agreements framing, in addition to horizontal cooperation between core city (core cities) and municipalities in the peri-urban area, practical implementation of multilevel governance principle in the decision making (e.g. re-

division of responsibilities based on efficiency and optimisation of problem solving level).

D.2. The processual building blocks of the common integrative functional urban areas` development management with integrated environmental management process

The joint concept of integrated functional urban areas` environment management builds on project cycle creating the core of integrated environmental management process framed by 5 guiding principles:

1. The main feature of integrated FUAs` environment management is its strategic character. It means the complexity of the process starting with diagnosis, via visioning, prospecting – planning and programming and ending with implementing and monitoring.
2. Integrated FUAs` environment management is the platform for integration of different interests, aspects, potentials, limits in the space/territory of the FUAs across different hierarchical territorial levels, sectors of policies, stakeholders.
3. Integrated FUAs` environment management is action oriented, it means the outputs from the planning, decision making and executing processes are the real improvements in the FUAs as the effects from managerial interventions across different levels of decision making, different target systems (ecosystems, infrastructural systems, social and economic systems) and different subjects involved.
4. The basic principle of integrated FUAs` environment management is the broad involvement of all stakeholders in FUAs into the decision making and implementation activities reflecting their different capacities for this involvement and collaboration.
5. Integrated FUAs` environment management follows the logic of gradual development with synergy effects between different interventions coordinated in the time and space. In the same time its architecture creates preconditions for flexible use and reacting to internal and external shocks understood as disturbances as well as the potentials for revolutionary improvements.



Scheme: The concept for integrative FUA environment management

The core quality followed by the project cycle which creates the backbone of integrated FUAs` environment management is the quality of life in the FUAs with the special focus on eco-system services as the precondition for sustainability of the quality of life. The project cycle includes the appraisal phase with the identification of the problems, their system ties, causalities and synergies, the hierarchy, spatial extent and affecting the different stakeholders.

This phase is followed by the phase of engagement focused on identification and addressing the stakeholders relevant for respective issue being it a problem or a challenge. Important is to analyse natural and institutional responsibilities, capacities (decision making, implementation) as well as capacities for collaboration and based on this to identify the most proper hierarchical level for the development of the strategy, decision making, strategy implementation, actions in the harmony with the concept of polycentric multilevel governance.

The development of strategy is understood as the participatory process involving the stakeholder following their individual engagement and capacity. The strategy development follows the logic of Goal Oriented Strategic Collaborative Planning (GOSCOP) starting with the diagnosis, continuing with the visioning, planning, programming and continuing into the implementation. The GOSCOP is the concept framing common

methodology of specific integrated FUA environmental management plans as reported in the Deliverable D.T1.2.1. The process of strategy development is closely interconnected with the individual and collective decision making. The required quality of the decision making independently from the character of it depends on availability/accessibility of proper information, involvement of relevant stakeholders and their capacities. In this context the inherent part of the common integrated FUAs management is the process of building up the capacities of stakeholders for active e participation in its execution.

The involvement of different stakeholders into the decision making is the precondition for their active participation in the implementation phase. The model of integrated FUAs` environment management is based on sharing the responsibilities not only in the phase of decision making but, first of all, in the phase of implementation activating individual financial, human, organisational and institutional capacities of respective stakeholders.

The project cycle is an iterative process in which the important role plays permanent monitoring and feedback allowing in the combination with flexibility of strategies reflecting directly the success assessment in which perceived quality by the public plays important role in addition to objective indicators of the progress. The basic consolidation phase can be understood as the process of permanent adjustment of the strategy to changing external preconditions as well as reflecting the feedback from the monitoring of the progress of the implementation of the strategy.

D.3. Topical/substantial architecture of the common integrated environment management of functional urban area

The object (target for the managerial interventions) of integrated FUAs` environment management are the development processes in the FUAs referring to the **actions that seek to improve human well-being**. Development is not identic with the quantitative growth, but mainly connected with the improvement of the quality of life in the FUAs. Development goals are relevant to all parties. Development encompasses social, economic, and environmental changes (innovations, degradation, growth, decline…) in intensive mutual interdependences.

That because the core principle of the LUMAT concept for integrated FUAs` environment management is the integration. The quality of life in the FUAs and quality of urban environment as the precondition for the quality of life of FUAs` citizens are synergic qualities to huge extend perceived subjectively. The integration in integrated FUAs` environment management includes different levels and different dimension. The levels are, first of all, represented by the hierarchy of territorial subjects from local/municipal via supra local, micro-regional (sub-regional), regional up to national and **European.**

There are substantial and processual dimensions of the integration in integrated FUAs` environment management.

The substantial integration is based on contextual understanding of particular problems and challenges for the strategy development, decision making and implementation as well as the integration of different aspects, factors, views, policies (sectoral approaches). This integration has got different levels of integration as well understood as levels of abstraction or level of aggregation.

The processual dimension of integration is based on integration of different particular processes in order to achieve complexity and in the same time efficiency of them (e.g. multi-actors decision making and participatory process of strategic environmental assessment) measures based on the comparison of the outputs/effects/improvements and inputs/used resources. Integrated FUAs` environment management includes the parallel and serial processual integration.

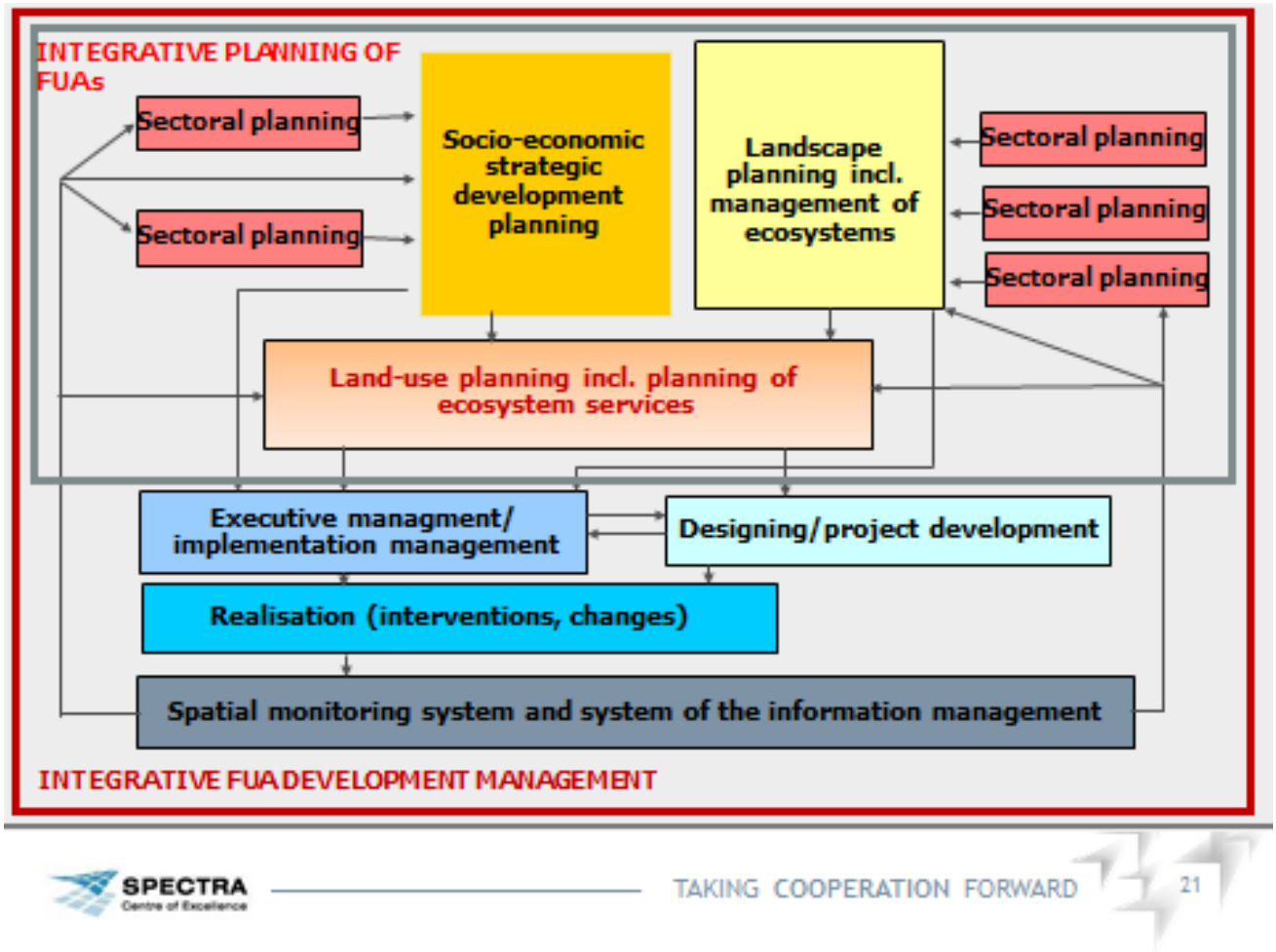
Parallel processual integration is focused on coordination and harmonisation of the parallel processes in the FUAs looking for their independences, contradictions, synergies etc. (e.g. the changes of the quality of public spaces in the core areas, the development of transport infrastructure and the processes of urban sprawl).

The sense of **serial processual integration** is the optimisation of interlinks between the actions in their logic time sequence. The main time axis is determined by the flow of activities starting with the diagnosis with identification of potentials, problems and challenges via visioning, planning, programming up to the implementation. Serial processual integration safeguards the coherence among the prospective activities represented by the complex of **FUA integrative planning** and executive activities represented by own development activities (among them implementation activities of plans and programs) and their management - **executive management.**

Planning is understood as basic management function involving formulation of plans to achieve **optimum balance of needs or demands with the available resources**. The planning process identifies the goals or objectives to be achieved, formulates strategies to achieve them, arranges or creates the means required, and implements, directs, and monitors all steps in their proper sequence.

The executive management focuses on efficient implementation of planned interventions (e.g. investments, regulations, subsidies…) and harmonisation of various activities driven by different stakeholders of FUA development. The main reference quality for executive management are the goals defined by the strategy of FUA development aimed at achieving improvement of the quality of life and its sustainability.

The topical/substantial architecture of integrated FUAs` environment management can be visualised as follows:



Scheme: Integrative FUA development management Source: Finka, M.(Ed.) Spatial Planning, Road Bratislava 2011 ISBN 978-80-88999-31-7.

Integrated FUAs` environment management integrating the planning for core urban area and peri-urban areas cannot simply be based on the extrapolation of planning approaches and tools applied parallel in rural and urban areas. In this concept it is based on the **construction of an approach that responds to the specific environment, social, economic and institutional aspects of the peri-urban interface** (Allen, A., Environmental planning and management of the peri-urban interface: perspectives on an emerging field in Environment & Urbanization, Vol 15 No 1 April 2003) (e.g. on processes of private appropriation of land, real-estate speculation, unequal conditions of environmental quality, areas subjected to environmental hazards often becoming the habitat of lower-income groups, whilst those areas of high environmental quality constitute the epicentre of speculative mechanisms, subtracting or "freezing" access for productive activities by previous dwellers or cancelling valuable ecological functions performed by natural systems).

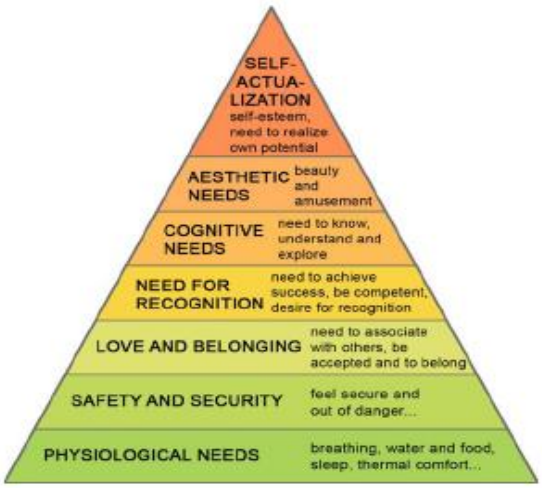
In the core of the concept for integrated FUAs` environment management creates optimized integrative land-use management and management of cooperation (including proper institutional framework) of the city core and its suburban areas seems to be the core instrument to face the threats in current urban/peri-urban development.

D.3.1. Ecosystem services as the conceptual basis of sustainable FUAs` integrated environment management process

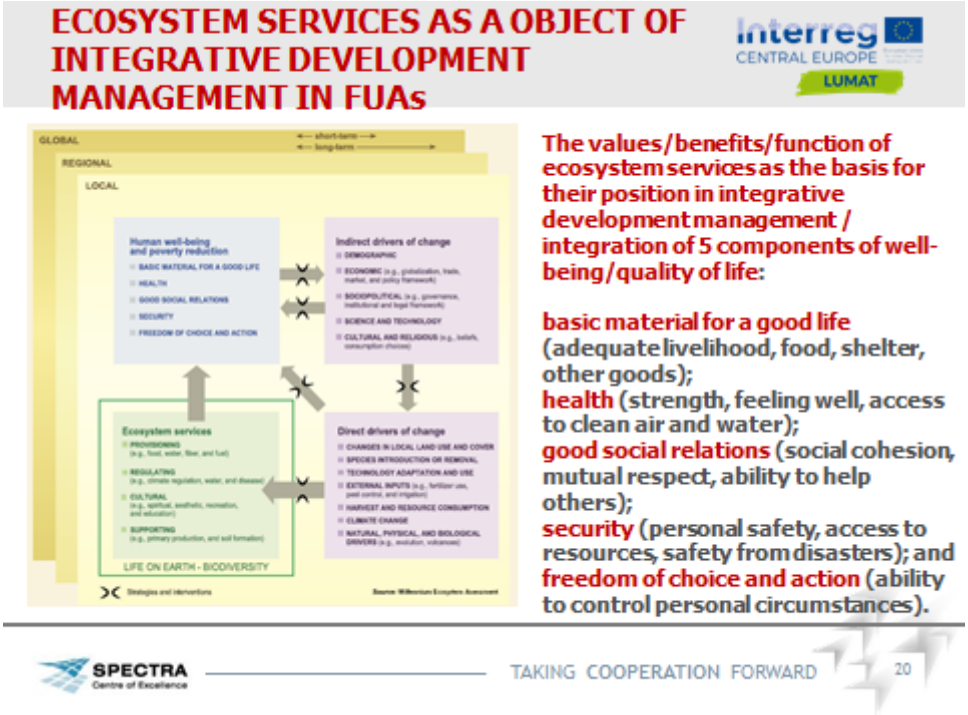
The concept of ecosystem services is seen by the LUMAT project as the conceptual basis for integrated environmental management including the land and soil management. As an attempt to express the benefits form eco-systems for human wellbeing by economic means it offers a common denominator for **the harmonization of different interests in the urban/peri-urban areas and threats based on the dichotomy** between core and periphery as well as seeming dichotomy between economic and social on one hand and environmental development on the other hand. In the past, environmental dimension in the decision making in spatial development management was represented by issues as mitigating the impact of development activities or establishing areas to protect wildlife and cultural landscape.

Ecosystems are rather complex dynamic functional units consisting of all plants and animals (biodiversity) in an area, together with the non-living, physical components of the environment (water, soil and air) with which they interact. The cities and FUAs represent the socio-ecosystems as they include ecosystem and man as a social being.

ECOSYSTEM SERVICES are the services provided by the natural environment which benefit people addressing their well-being, satisfying their needs **existential security, social and economic prosperity.**



Scheme: Satisfaction of human needs Source: Maslow, A. H. (1943). A Theory of Human Motivation. Psychological Review, 50(4), 370-96.



Scheme: Ecosystem services as an object of integrative FUA environment management Based on: Millennium Ecosystem Assessment (2005). Ecosystems and human well-being: synthesis (PDF). Washington, DC: Island Press. *ISBN 1-59726-040-1. Retrieved 7 August 2014*.

The confrontation of the demand represented by the needs and the offer represented by the availability of services and their ability to satisfy the needs represents the value of services.

We need to consider not only mitigation and protection within a broader approach, but the fact that the people in their daily lives depend on a range of services that ecosystems provide and our role is not only to protect but to develop them in parallel. These services are fundamental to attaining quality of life of the citizens as main integrative development goal. There is no single way to implement an Ecosystem Services Approach.

FUAs represent very complex, dynamic socio-ecological systems of biophysical and social factors defined at several spatial, temporal and organizational hierarchically linked scales. The biophysical factors are represented by **ecosystems** as rather complex dynamic functional units consisting of all plants and animals (biodiversity) in an area, together with the non-living, physical components of the environment (water, soil and air) with which they interact. The ecosystems are significant with different levels of self-organisational and adaptive abilities. The social factors are represented first of all by social units consisting of citizens, visitors, local economy players, and other subjects of social life in the FUA, their mutual interactions as well as interactions with the subjects of society they are imbedded in.

The main task of integrated FUA environment management is to safeguard that they regularly interact in a resilient, sustainable manner, especially in the context of the presence of critical resources whose flow and use is regulated in the interaction between natural and societal processes.

This concept of the cities and their peri-urban areas as socio-ecological systems is crucial in integrated concept of FUAs sustainable development management as it stress the fact that the delineation between social systems and ecological systems is artificial and arbitrary (Berkes, F., Colding, J., and Folke, C. (2001) Linking Social-Ecological Systems. Cambridge: Cambridge University Press), as they are linked through multi feedback mechanisms and that both display resilience and complexity. The most comprehensive theoretical background is created by Elinor Ostrom`s Social-Ecological Systems framework, within which much of the still-evolving theory of common-pool resources and collective self-governance is located (see as well Cumming, G.S. (2011), Spatial Resilience in Social-Ecological Systems, Springer, London). It also draws heavily on systems ecology and complexity theory incorporating ideas from theories relating to the study of sustainability, vulnerability, resilience and robustness, which makes this theoretical framework much more relevant for the common FUAs integrated environment management in the context of challenges resulting from climate change and growing uncertainties in the development of FUAs among other reasons resulting from the growing role of multi-actors of FUAs development and their individual decisions.

For the LUMAT concept of the common FUAs integrated environment management is important the conceptualized knowledge resulting from the research of the teams around Elinor Ostrom that the management processes in such complex systems as cities and FUAs can be improved only by making them adaptive and flexible, able to deal with uncertainty and surprise, and by building capacity to adapt to change.

The object of the FUA integrated environment management are the processes in both - social systems and eco-systems and especially their mutual interaction where the biggest challenge represents the question of harmonisation of different demands of different elements of social systems as well as eco-systems in the confrontation with the limitation of the available resources and preferences in the access to them and function of sustainability.

There is a whole scale of different conceptual frameworks for addressing these tasks of harmonisation of social systems and eco-systems development (e.g. circular economy), but the complexity of the tasks of FUA integrated environment management is not every time properly covered by them, as they mostly use to focus on particular human activities and are not fitting to the complexity of FUA functioning and development processes.

As proper interface between social aspects and ecological aspects of this harmonisation can be understood the concept of **the ecosystem services** - services provided by the natural environment which benefit people. Understanding of the ecosystem services is ‘challenging the misconception that we must choose between the natural environment and economic growth’ (Natural Environment White Paper Consultation, Sept. 2010).

The ecosystem services reach from providing the products satisfying the basic needs of humans as biological elements - food, clean air, fuel, timber (provisioning ecosystem services) via creating a proper framework for their existence by influencing climate, floods etc. (regulating ecosystem services), safeguarding sustainability of the processes framing the existence of humans - water cycling, soil formation (supporting ecosystem services) up to human needs at the top of Masslow's pyramid - aesthetic and cognitive inputs, health, recreation and tourism (cultural ecosystem services).

The confrontation of the demands represented by the needs and the offer represented by the availability of services and their ability to satisfy the needs define the value of services. In regard to the common FUA integrated environment management the most important questions using the concept of ecosystem services are as follows:

- how much an ecosystem contributes to the society and its economy?
- what are the benefits and costs of an intervention that alters the ecosystem (conservation, restoration, development project, regulation or incentive)
- how are costs and benefits of a change in ecosystem distributed and how to secure justice in this distribution?
- how to compare ecosystem goods and services with other inputs into the economy and other societal processes (e.g. investments)
- how to internalise the ecosystem externalities of economic and non-economic activities
- how to balance the short and long term effects in economy and environment

One of the crucial connected questions for FUAs` integrated environment management is the problem of multi-dimensional impacts of landscape fragmentation on ecosystem services which is one of main features especially in urban and peri-urban areas. At this scale one of the main challenges is how to optimise the allocation and management of different land uses and their sprawl and how to minimise the implications for ecosystem services (see Rodriguez, J. P., Beard, T. D., Bennet, E. M., Cumming, G. S., Cork, S. J., Agard, J., et al. (2006). Trade-offs across space, time and ecosystem services. Ecology and Society, 11).

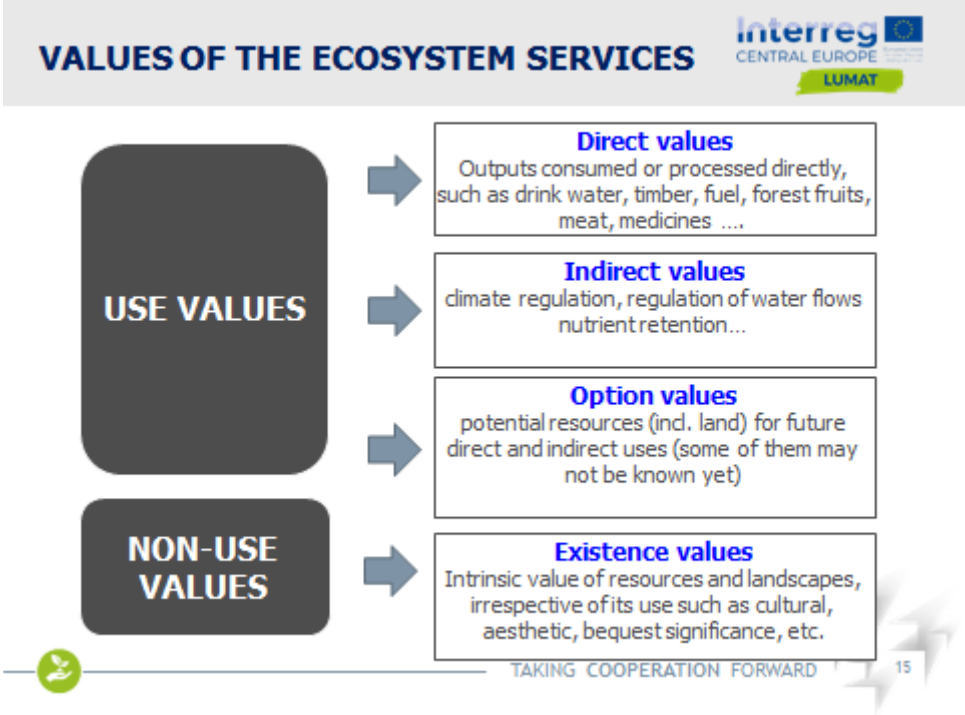
In answering the questions above we have to be aware about the limits of the concepts of ecosystem services as it is not easy to put a cash value on nature. On the other hand the use of this concept can support wider understanding and rising awareness about the services provided by nature, their values and with this introduction of innovations in economic valuation addressing the value of ecosystem services.

The incorporation of the ecosystem services in the concept of FUA integrated environment management allows to take the value of the natural environment into account in cost-benefit analysis and to solve the problem of the imbalance among beneficiaries and losers.

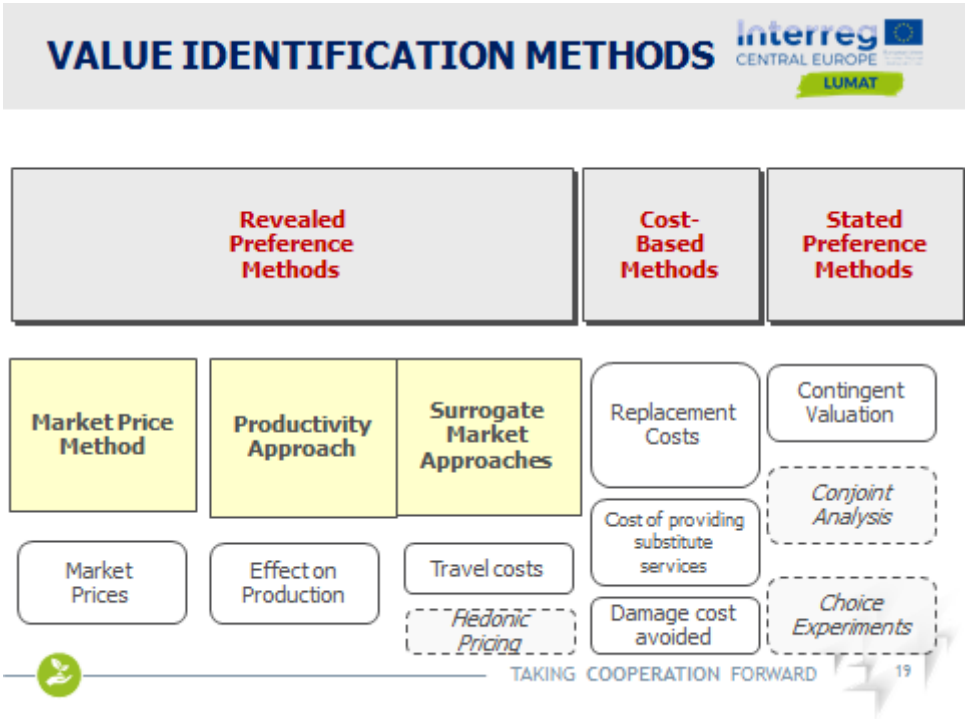
Understanding the value of the natural environment enables:

- ✓ decisions on the land use that do not compromise benefits to society, business and the economy
- ✓ decisions on the land use able to balance real costs and benefits and secure the justness of their distribution

- ✓ improved delivery of services through better use of the land and linked natural environment
- ✓ reduced business risk and increased business opportunity



Scheme: The values of ecosystem services and their identification. Source: Perrot-Maître, D. (2005) Valuing ecosystem services-advantages and disadvantages of existing methodologies and application to PES. Seminar on environmental services and financing for the protection and sustainable use of ecosystems, Geneva, 10-11 October 2005



Scheme: Value identificatin methods usable for integrated FUA environment management. Source: Perrot-Maître, D. (2005) Valuing ecosystem services-advantages and disadvantages of existing methodologies and application to PES. Seminar on environmental services and financing for the protection and sustainable use of ecosystems, Geneva, 10-11 October 2005

D.3.2. Multilevel polycentric governance as the core concept of integrated environment management of the FUA development

Integrated environment management of the FUA development has to be understood as a task of the system of territorial governance. Territorial governance is mainly understood as "the manner in which territories of a national state are administered and policies implemented with particular reference to the distribution of roles and responsibilities among the different levels of government (supranational, national and sub-national) and the underlying processes of negotiation and consensus building" (COM 2007).

The practice of European spatial development management is experiencing the movement from traditional model of hierarchical territorial government, connected closely to the very sensitive issue of territorial sovereignty across different levels of territorial units (local, regional), to the system of governance where the power is shared and split among a variety of stakeholders creating overlapping vertical and horizontal co-operation patterns between governmental and non-governmental public and private structures across various levels of decision making. This natural process is driven by the development of new types of spatial structures not only overstepping the borders of administrative units like national states, counties or municipalities, but representing new qualities – increased permeability of territorial borders and openness for new spatial organization of human activities and the self-organizational mechanisms. The FUAs belong to such spatial structures including the territory of several municipalities but only seldom creating institutionalised territorial unit with adequate governmental or self-governmental bodies.

Such open systems allow high level of individual freedom (e.g. decision-making freedom, individual mobility), allowing and initiating not only changes in individual and collective behaviour and attitudes (e.g. new definition of belonging, territorial responsibility, shift from local to regional and global thinking, social control), but even the changes of territorial systems themselves.

The definition of "hard" borders and institutionalisation of the FUA as governmental or self-governmental territorial units would be even in the contrast with the nature of FUAs and processes there, as they are related to different, only partially overlapping spaces and it is no more possible to define exactly the borders of functional space of a city or of a region. The administrative borders lose its importance for spatial organization of citizens' activities. Many people do not spend dominant part of their daily life in their home city; they use to commute for work, for leisure time activities, for services from municipality to municipality, from core city to peri-urban area and in opposite. The question of their legitimacy to take part at the decision making in one, or in another municipality, or region and of appropriate modes of governance in such opened multi centric territorial systems appears. We can speak about soft spaces and their fuzzy borders, about poly-centric governance, fuzzy and soft governance modes.

Efficient use of territorial capital including the potential of ecosystems to provide eco-system services is closely connected with the cooperation of the territorial subjects and labour division in the FUA. For such cooperation the geographic proximity can play important role, but it is less and less dominant factor. As the spatial development practice shows, providing spatial linkages inside of a group of neighbouring cities is not necessarily leading to functional interdependencies. Fuzziness and softness as the significant features of FUA are very close but not identical qualities. Fuzziness of the space relates to the definition of belonging and un/certainty in it, can be defined as the feature of physical as well as social spaces. Softness of the spaces is the feature of social spaces, relates to the perceived quality of spatial framework for human activities and processes, to the development flexibility and openness for self- definition and self-organization processes (Finka, M. 2001).

Reflection of this new reality in spatial organisation of human activities, including and determining economic processes, is one of the preconditions for strengthening the sustainability of spatial development in the FUAs facing increasing level of uncertainty, unexpected internal disturbances and external shocks the cities and their peri-urban areas have to face.

The dominant approaches in current spatial development practice based on the development of the 'hard' infrastructure, such as efficient communication networks, protective dams, renewable energy production technologies etc. are not complementarily completed by adequate 'soft' infrastructure, including in particular an effective institutional framework allowing efficient realisation of governance processes, as an important prerequisite for developing and sustaining economically, socially and environmentally balanced settlements structures.

Morphologic and functional structures of FUAs in the combination with already traditionally implemented hierarchic multilevel governance seem to create optimal spatial framework for polycentric governance systems consisting of democratic units at different hierarchical levels that each exercise considerable independence to make and enforce rules within a circumscribed scope of authority for a specified territorial unit. In

this system traditional territorial governance units – municipalities and self-governmental regions or state administrative regional units play the role of the general-purpose governments with clear territorial belonging, whereas the second layer may be represented by specialized decision making centres with much softer territorial ties but directly linked to the self-organisational management of specific resources (e.g. of ecosystems providing eco-system services), among them at the first place territory itself with its specific potentials. (e.g. soil, water, renewable energy resources…). They may be organized in special softly defined territorial unit of FUA, as non-governmental organisations, networks or clusters with fuzzy character of their spatial/territorial definition. They may create parallel adaptive systems that are nested within ever-larger units at the regional and national level that are themselves parallel adaptive systems.

Such polycentric governance systems in the FUA as the combinations of external rules imposed by territorial authorities as well as self-governed informal rules in use open the space for considerable autonomy of particular decision making centres to experiment with diverse rules for using a particular type of resource system and with different response capabilities to external shocks. Higher resistance of the system as a whole is based on flexibly acting smaller-scale soft governance units in polycentric system where the decision maker has got better access to local knowledge, rapid feedback from the implementation process of their decisions allowing them to learn from own experience and experience of parallel units.

The actors of FUA development participate on hierarchical territorial government system collaborating on strategic planning, participating in decision making and implementation of the policies. This means the shift from traditional, in many cases inflexible and not problem oriented schemes, to efficient framework of rules empowering relevant territorial governance actors to participate and to overtake responsibility for the decision making and at the same time to protect territorial souverenity and subsidiarity as the guiding principles of decision making legitimacy but overstepping the limits of territorial belonging reflecting the reality of everyday living processes in the society and economy typical for knowledge based society. The model for this shift seems to be the synergy of multilevel governance principles as declared in the Charter for Multilevel Governance in Europe (CEC 2014) and polycentricity concept in the form of the multilevel polycentric governance.

The multilevel polycentric governance model creates the basis for

- inclusion and participation, broad participation of public and private actors (self-governmental bodies, NGO, firms, individuals, association) directly or through legitimate intermediate institutions, strengthening of collaborative decision-making;
- subsidiary by decentralising most of the decisions concerning the particular issues to the decision-making level consistent with efficient and cost-effective delivery of outputs;
- non-hierarchical modes of guidance, such as persuasion and negotiation;
- acknowledgement of diversity, as crucial mean to improve well-being of FUA citizens;

- Accessibility and equity (equal access to the participation on decision making, to the services, work…);
- accountability/transparency of decision makers across different levels of territorial government involved, in the private sector and in the civil society organisations should be accountable to the public as well as to institutional stakeholders (publicizing planning and programmes, performances), etc.;
- sustainability in all dimensions of FUA development;
- efficiency and effectiveness, (in the delivery of public services, promoting FUA economic development, production that meet needs, while making the best use of resources);
- security and safety of individuals and their living environment (crime and conflict prevention and disaster preparedness);diffusion of information and learning, self-learning, knowledge affordability (iterative process of monitoring and target readjustment, networks, etc.);
- diffusion of understanding of complexity of FUA development among decision makers;
- rising awareness about necessity of strategic thinking and long term perspective thinking;
- comprehensive and innovative management;
- flexibility of strategies and tools and capacity of adjustment using soft tools.

Multi-level polycentric governance in the FUAs emphasizes the dispersion of decision making from the local to the global level incl. "vertical" dimension referring to the linkages between higher and lower levels of governance and "horizontal" dimension referring to the arrangements of co-operation a participation at the decision making among different actors at the level of regions or municipalities. These agreements are increasingly common as a means by which to improve the effectiveness of local public service delivery and implementation of development strategies

Integrated environment management for urban/peri-urban areas – FUAs seems to be **realistic only using the potential of the concept of multilevel polycentric governance as a core concept for efficient and effective institutional framework** in the field of environmental and especially of land use management. The multilevel polycentric governance concept provides, by proper arrangement of the interrelations among different types government and governance, the frame for integrating conceptually the set of **informal management instruments** (planning, decision making, implementation - executive instruments - creation of land agencies, revolving financing modes, impact compensation modes) **with formal institutionalized** (obligatory used e.g. land-use plans, regulatory decisions…) and other instruments like European Standard for Land Information and Balances in regional plans (CEN-Agreement), evaluation tools for land portfolios, calculating follow-up cost in strategic development plans etc.

The joint model for integrated environmental management for urban/peri-urban areas – FUAs reflects the **lack of institutions with a clear and specific remit on urban/peri-urban areas**, it has to **allow to integrate the policies and strategies** that affect the urban/peri-urban areas from the broader perspective, considering the policies with more

immediate impacts as well as those which affect a variety of flows between rural and urban areas.

Integrated environmental management for urban/peri-urban areas aims at delivering positive changes in rural-urban linkages that both enhance the use and state of natural resources and improve the livelihoods of citizens and subject of the local and regional economy.

The concept includes a focus on **localized and discrete actions**, **reflection of the pressures and flows at the regional level as well as urban perspective of seeking the comprehensiveness of the development mirrored in the planning system and allied institutions.** Integrated environment management for the urban/peri-urban interface requires a combination of methods that strike a balance between local planning (paying particular attention to the heterogeneity of and power relations within peri-urban communities) and the broader dimension of regional planning.

The **key features of the urban/peri-urban areas** which are reflected in the content, approaches, tools as well as institutional arrangements of integrated environmental management are as follows:

- the specific ecological nature of peri-urban systems;
- the heterogeneity and threats of diverse qualities (potentials and limits) and demands;
- the vulnerability of the peri-urban socio-ecosystem;
- fuzzy character (the difficulty to identify the boundaries) of the area versus territorial governance systems;
- Multifunctional use of the area and variety of land use in rather fragmented urban and peri-urban landscape.

Integrated environmental management for urban/peri-urban areas has **a strategic and at the same time executive nature** creating a balance between the formulation of long-term, cross-sectoral and dynamic strategies and the development of short-term interventions.

The **joint model of integrated environment management** for urban/peri-urban areas developed in the frame of LUMAT is able to embed diversity of local, regional and national practice and legal environment understanding current integrative and sectoral policies that affect directly and indirectly the development of urban/peri-urban areas.
The object of integrated environmental management for urban/peri-urban areas are rural-urban linkages or flows (of goods, people, commodities, capital, information) which can be mutually reinforcing or truncated, leading to different trajectories and reciprocal or opposing relationships between urban and rural development.

Integrated environment management for urban/peri-urban areas requires the **engagement of a broad variety of actors,** ranging from the local communities living and working in these areas to institutions operating at the sub-national and national levels. Treating urban, rural and natural ecosystems together increases the complexity of participatory strategies but builds new forms of collaborative arrangements that transcend the boundaries of urban and rural action. A strategic approach consists of

identifying the specific institutions and actors affecting and being affected by different processes of change. This type of **"issue-specific institutional arrangement"** has been successfully adopted in the definition and implementation of urban environmental planning and management within the framework of Local Agenda 21. Typically, this process starts with a broad consultation in which different actors and institutions are brought together to participate in a comprehensive environmental forum. This forum is the basis for setting broad-based consensus on issue-specific objectives and strategies. The different issues that are prioritized become the basis for establishing **more specific institutional arrangements, usually in the form of a series of thematic working groups and a steering committee.** Specific partnerships are established for the practical implementation of concrete actions (Allen, A., Environmental planning and management of the peri-urban interface: perspectives on an emerging field in Environment & Urbanization, Vol 15 No 1 April 2003).

Integrated environment management for urban/peri-urban areas gradually tends to cover more issues and to involve more stakeholders. To be able to handle the growing complexity it is necessary to develop the **model addressing an incremental process, which highlights the importance of working gradually at several levels** (from the regional to local level and vice-versa), seeking their **articulation at different stages** of the process.

The common model for integrated environment management for FUA does not mean unified strategies for FUA development. It is understood as a framing concept supporting the development of specific strategies reflecting specifics of respective FUA. That because important part of the model create criteria for selecting alternative strategies mirroring on one side the FUA specifics on the other side the joint values and goals resulting from the common understanding of priorities of the spatial development in the FUA as defined in the LUMAT project.

The dominant criteria are:

1. Political viability
    a. How high is the political potential to undertake a major activities?
    b. Does the public understand the problem, the goals and supporting actions to address it?
    c. What is the range of interests that would be affected?
2. Legal authority and institutional capacity
    a. Does the legal environment offer proper framework for adopting and carrying out the strategy in FUAs?
    b. Is there institutional capacity for adopting and carrying out the strategy
    c. If not a) and/or b) is there real potential to develop proper institutional capacities in time?
    d. Does the decision maker have an adequate authority to carry out the strategy?
    e. Is there the potential or necessity to build a partnership with another government body that has authority?
    f. Does the strategy require coordinated or joint actions across scales and/or sectors, is there a mechanism to do so, or can one be created?
3. Economic viability
    a. Is the strategy cost-effective for society as a whole?
    b. Is the strategy efficient? Are there more efficient alternatives?

   c. How is the balance between different resources (with special focus on natural resources incl. land and soil) activated in the strategy, is their use sustainable?
   d. What are and how is the proportion between economic and non-economic benefits?
4. Effectiveness
   a. Is the development strategy based on actions that are capable of modifying the direct and indirect drivers of the FUA development and especially of the ecosystem change? If yes, what is the balance between positive and negative changes?
   b. Is it possible to set an incentive such as a tax credit at the appropriate level to change behaviour?
   c. Can the results of the implementation of the strategy be measured and used for accountability and to change course as appropriate?
5. Equity
   a. How is the arrangement of the division of cost and benefits (not only financial, but environmental and social as well) – is there an equal balance?
   b. Is the outcome fair to all stakeholders? Is the strategy based on fair processes of public participation incl. the decision making processes?
   c. If there are "losers" under the strategy implementation, how and where they will be compensated (with special attention to the ecosystem services)?

As the analyses, reported under the Deliverable T1.1., have shown, current challenges for the management for the FUA lack a well-institutionalized policy domain and the situation is mainly characterized by only weakly defined responsibilities, procedures and routines. Therefore comprehensive, coordinated strategic approaches integrating different areas of expertise, developing a comprehensive approach across different levels and promoting bottom-up approaches are needed.

In addition there is the need to develop further innovative approaches and solutions able to address different aspects of the wicked problems of sustainable development of FUAs and especially in the field of ecosystem services management reflecting the problem perception and interests of the different actors involved in and necessary for problem solution (Fröhlich and Knieling, 2013: 11f).

Public participation

Important part of the multilevel polycentric governance concept is the process of public participation involving all stakeholders into the processes of visioning, preparation of the plans and programs as well as their implementation. Stakeholder participation is a tool which enables local and regional stakeholders to get involved in the planning and delivery of innovative local solutions of FUA problems. Stakeholder engagement process provides stakeholders with an opportunity to state their opinions; it creates an opportunity for debate, empowers stakeholders in decision-making, and ensures that stakeholders have a sense of ownership in the decisions taken. To be engaged means an opportunity to get informed, to learn and to deliberate. In this

approach, stakeholders communicate not only with decision-makers but also among each other.

According to Eurosite Management Planning Toolkit, the consensual/participative management planning approach can be achieved in different ways:

- consultation before drafting of the plan begins;
- cooperative working during the whole drafting process;
- consultation following various stages of plan production;
- consultation on completed draft plans.

The integrative character of the FUAs` integrated environment planning considers continuous consultation in various stages of management plan production to be the most appropriate since this approach also respects to the highest degree the requirements of the Aarhus Convention on Access to Information, Public Participation and Access to Justice, and the Convention on Biodiversity where the management of land and water and living resources is seen as being a matter of societal choice.

Crucial aspect for the success of the engagement process is to inform and involve stakeholders in the early stage in order to build the commitment and trust for future actions. Stakeholders should be involved when all options are still open and engagement should continue throughout the planning process. If stakeholders are involved at a late stage of the process, or at the stage when the decisions have already been made, this can create a feeling of manipulation and increase distrust. In these cases it is better not to open the participation at all.

Benefits and barriers of stakeholder engagement

The overall benefit of stakeholder participation in integrated environment management planning is a better quality of a management plan. As stated in IUCN Guidelines for Management Planning in Protected Areas, the list of benefits includes the following:

- increased sense of ownership
- greater support for the protective measures
- links planning for conservation with planning for development
- provision of communication mechanism

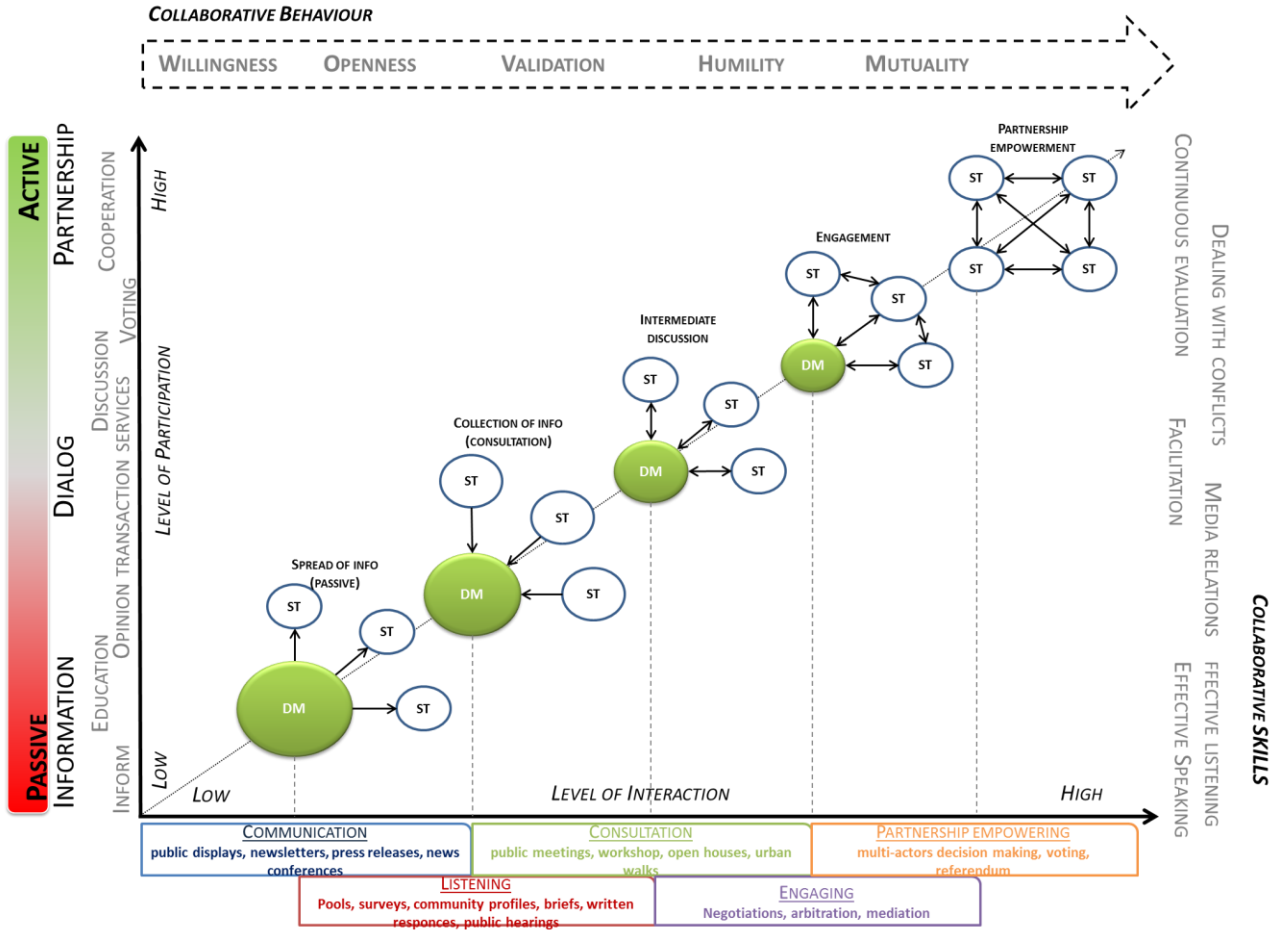
Engagement of stakeholders brings knowledge about problems and needs into the planning process, it solicits the views of citizens on proposed options, allows the development of alternative solutions, and provides an opportunity for the public to discuss and understand complex issues. It enables better quality of decisions, and creates common basis for harmonised actions. It raises awareness about behavioural

modes, helps to overcome conflicts and increases public support and social empowerment. Stakeholder engagement also increases the legitimacy of the planning and decision-making process as it enables a dialogue and deliberation about the issues. It also enables stakeholder's feedback on the acceptability and usefulness of management actions. Engagement of stakeholders is a demanding process, often accompanied by barriers which are mainly related to weak capacities and skills for participation, difficulties in reaching consensus, prolongation of the planning process due to the engagement, and increased costs.

The following main principles are crucial for successful stakeholder engagement in accordance with the above mentioned guidelines:

- **Efficiency:** The efficiency principle requires clear and well-designed procedures as well as a stakeholder engagement plan for informing, consultation, and active participation of stakeholders in decision-making process.
- **Inclusiveness and transparency:** This principle requires an open and transparent engagement process and inclusion of a wide range of participants from the community with special focus on the proper selection of key stakeholders and tailored consultation processes.
- **Effectiveness:** The effectiveness principle requires that stakeholders' views are taken into account and have a real impact on plan or policy development and implementation. In cases when there is no clear genuine role for stakeholders to play or when it is not sure that they can influence decisions, the involvement is not reasonable and could bring negative effects.

The involvement of the stakeholders (public participation) has 5 main levels which can be interpreted as the steps in which the decision makers are engaging different stakeholders with different intensity and in different positions. The initial phase of stakeholder involvement is mapping which provides the essential early information about the stakeholder of the FUA development. Each phase has its specifics which need to be taken into account by choosing approaches and tools of the stakeholders` involvement. The figure below shows the development of respective phases of the procedure and its internal logic and features of main 5 phases including the changing position (dominance) of decision makers (DM green) and other stakeholders from phase to phase.



Scheme: Phases/levels of the stakeholders participation Source: Finka, M., Ondrejicka, V. (2017) The Scheme of Stakeholder Participation, Transgreen project, Bratislava STU.

E. Conclusion

The LUMAT concept of a common strategy for integrated FUA environment management including the urban/peri-urban relationship in FUAs with the focus on integrated environmental management related to the component of land and soil creates a framework for the development of locally based strategies in the respective FUAs in the project LUMAT partners' countries.

The conceptual approach is based on integrated urban environment management in the functional urban areas (FUAs) as a tool for optimization of land-use and soil management and its synergy with the concept of ecosystem services as well as management of cooperation of the city core and its suburban areas including institutional framework. As a leading managerial concept the concept of multilevel polycentric governance was chosen as a core concept for efficient institutional framework in the field of sustainable land use and soil management.

The LUMAT concept of a common strategy for integrated FUA environment management works with functional urban areas as the functional territorial units defined based on analyses of natural ties of interdependences and collaboration between core city and municipalities in the peri-urban areas institutionalised or based on national policies implementation (including adopting the OECD methodology) (top-down approach) or based on collaboration agreements framing, in addition to horizontal cooperation between core city (core cities) and municipalities in the peri-urban area based on practical implementation of multilevel governance principle in the decision making (e.g. re-division of responsibilities based on efficiency and optimisation of problem solving level).