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A PSYCHOSOCIAL APPROACH APPLIED TO TERRITORIAL PLANNING AND DEVELOPMENT. THE CASE OF THE COAST OF CANTABRIA (SPAIN)

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Abstract. The current study describes an innovative methodology of territorial planning and development facing the ecological, cultural and economic challenges coming from urban, industrial and touristic pressure on the coastal lines. The main goal underlines the potential of a dynamic integration that coastal territories, river basins, and inshore seas to reach effective strategies of sustainable development. The methodology was build based on participatory studies for territorial development from psychosocial approaches, and the analysis of experts in 6 countries, with the main case centered on the coastal region of Cantabria (Spain). The methodology is focused on the ecocultural values and local knowledge as synergic vectors of cultural and social development, being projected as strategic corridors due to their diversity and natural capacity to shape territory and landscape. The territorial planning model here proposed is grounded on a participatory governance methodology. Local knowledge is transformed into a collective mapping of cultural, historic, social, economic and ecologic values of population and institutions. The final result is the definition of ecocultural coastal plans including territorial value chains and networks of socio-ecological integration. The dynamic nature of this methodology allows being used as a main base for territorial planning processes or as a complementary tool to enhance the classic methods of territorial planning.

Keywords: ecocultural values, territorial planning, coastal-planning, integrated sustainable urban development; psychosocial approach.

UN ENFOQUE PSICOSOCIAL APLICADO A LA PLANIFICACIÓN Y DESARROLLO TERRITORIAL. EL CASO DE LA COSTA DE CANTABRIA (ESPAÑA)

Resumen. El presente estudio describe una metodología innovadora de planificación y desarrollo territorial ante los desafíos ecológicos, culturales y económicos derivados de la presión urbana, industrial y turística en las franjas costeras. El objetivo principal subraya el potencial de integración dinámica que poseen los territorios costeros, cuencas fluviales y espacios litorales para el logro de estrategias efectivas de desarrollo sostenible. El diseño de investigación y desarrollo metodológico está basado en estudios participativos para el desarrollo territorial desde enfoques psicosociales, y en el análisis de expertos en 6 países, con el principal caso de estudio en el litoral de Cantabria (España). La metodología propuesta se centra en los valores ecoculturales y los conocimientos locales como vectores sinérgicos de desarrollo cultural y social, proyectándose como corredores estratégicos debido a su diversidad y capacidad natural para modelar paisaje y territorio. Se propone una ordenación territorial basada en una gobernanza participativa donde el conocimiento local es transformado en un mapeo participativo y colectivo de los valores culturales, históricos, sociales, económicos y ecológicos de la población y sus instituciones. El resultado final es la implementación de una cartografía ecocultural que incorpora cadenas de valor territoriales y redes de integración socio-ecológica. El carácter dinámico de esta metodología permite su aplicación como base principal de un proceso de ordenación territorial o, de forma complementaria, para enriquecer los métodos clásicos de planificación y ordenación territorial.

Palabras clave: Valores ecoculturales, ordenación-del territorio, planificación costera, desarrollo sostenible integrado, enfoque psicosocial

Introduction

Urban, industrial and tourist developments are increasingly impacting the coastlines in Europe and also in other regions on a global scale. In this way, urban expansion, transport infrastructures, coastal geoengineering and tourist developments have altered natural coastlines causing serious social, cultural and ecological fractures between land and sea, and in many cases have depleted traditional resources that have sustained local economies.

Trends in spatial planning in the coastal area from a psychosocial framework

Current approaches to spatial planning advance towards a better understanding of the link between society, culture and territory as forces that converge in a dynamic and mutually enriching relationship. In this sense, some territorial planning projects in the coastal area address the society-ecosystem interaction with a more holistic and global vision of the territory projected in the cultural landscape.

A more active role of ecological and cultural heritage is promoted, consolidating concepts such as value chains in the Blue Economy (eg., Pauli y Leal, 2011; Smith-Godfrey, 2016; Ivanova et al., 2017), those of ecocultural corridors and networks, local agroecosystems, participatory traceability, community landscape management, which can be promoted through a participatory governance strategy for spatial planning under sustainable development (eg., Boissevain y Selwyn 2004; Constanza et al., 2013; Duarte,

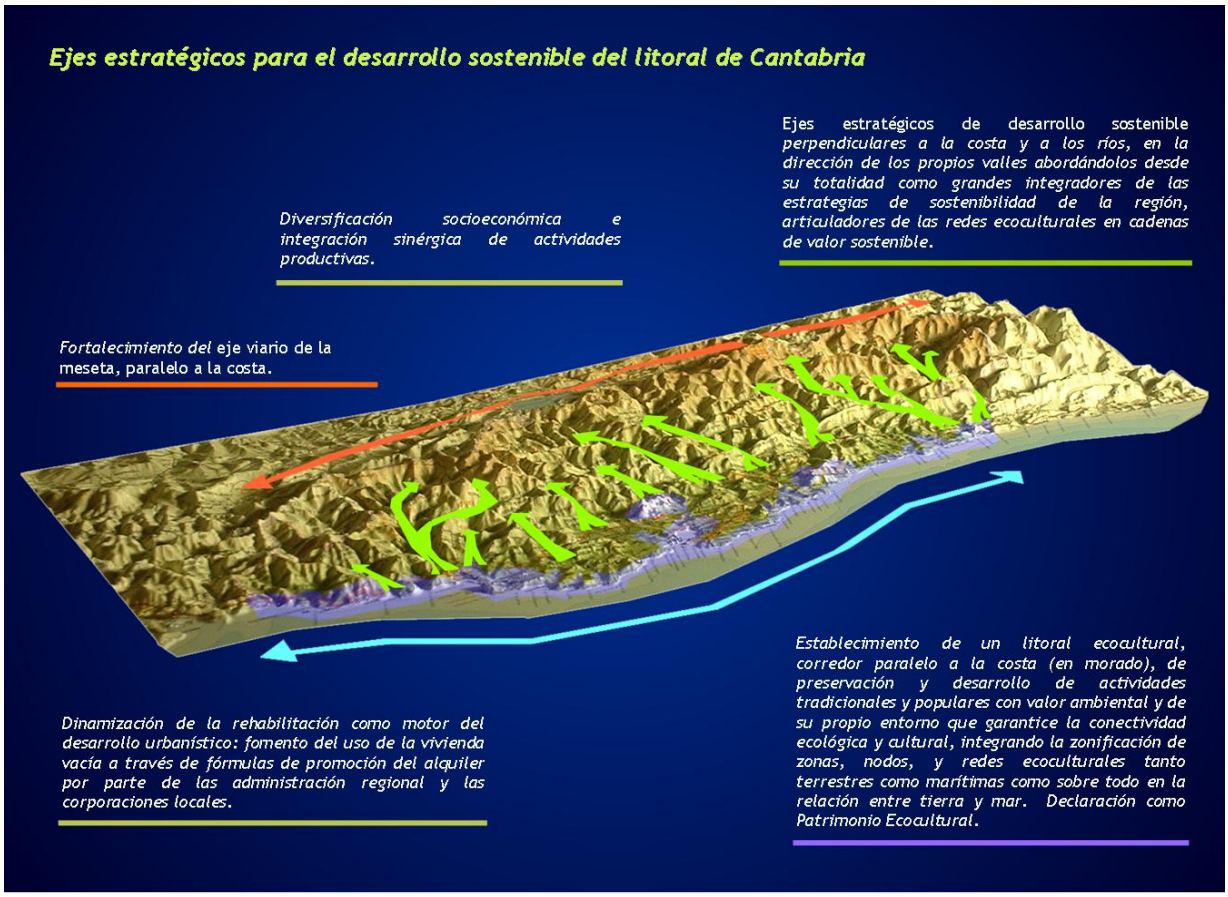
Doherty y Nakazawa, 2017; Gandarillas, 2009; Hall y Hesse, 2013; Harrison y Hoyler, 2015; Inwood, Wharton y Davies, 2015; Lewicka, 2011; Makhzoumi, Chmaitelly y Lteif, 2012; Ros-Tonen et al., 2018; Schilleci, 2012; Smith et al., 2011; Tengberg et al., 2012; Van der Knaap y Ivanov 2005). This sociocultural approach is not exclusively an academic vision, but is immersed in regional planning strategies and institutions on a European scale, particularly in the ELC (European Landscape Convention), which considers the landscape as a transversal, complete and holistic through the physical-cultural division and calls for the enhancement and strengthening of citizen participation in all European regional areas.

In recent years, these concepts have also been introduced in the territorial planning of the coastal and maritime sector, with a growing awareness and concern for the effective zoning of the different uses of the landscape and resources and their protection or levels of conservation (eg., Boissevain y Selwyn, 2004; Duarte, Doherty y Nakazawa, 2017; Kenchington y Day, 2011; Krost, Goerres y Sandow, 2018; Smith et al., 2011; Vallega 2003; Van der Knaap y Ivanov, 2005). This revolution in participatory spatial planning has been driven by new technologies, where there has been the rise of digital technologies focused on the contribution of geographic information (GI) by citizens. Participatory Geographic Information Systems (GIS) (PGIS) and Voluntary Geographic Information (VGI) approaches encompass platforms and tools such as participatory sensing and WebGIS (web maps, virtual globes, mash-ups, dynamic GIS, cyber-cartography, geo-tagging , human sensor networks, localization means), (see Corbett y Cochrane 2017; Dodge y Kitchin 2013; Graziano 2017; Haklay 2013; Levin et al., 2017; McCall et al., 2015; Rawat y Wie Yusuf, 2020; Verplanke et al., 2016).

These tools integrated into fixed and mobile devices (especially smartphones) offer enormous potential to collect information through citizen participation in an Open Government framework (Pastor Albaladejo, Sánchez Medero y Mairal, 2020), since they are increasingly ubiquitous, accessible and easy to use. These digital solutions are fused with knowledge frameworks that involve citizen science from an open innovation approach (including computing, voluntary thinking, and participatory detection), crowdsourcing (for example, OMS) and others. It consists of content generated by users and a great variety of approaches and techniques developed with the intention of involving citizens and stakeholders at the local level, in the processes of determining the scope of the problem, evaluation, prioritization, development of models, monitoring, etc. (Ros -Tonen et al., 2018; Voinov et al., 2016). In the coastal context, this includes visualization and goal setting (Hewitt et al., 2014), fuzzy cognitive mapping (Meliadou et al., 2012), mental modeling (Sano et al., 2014), and advancement in public innovation (Mairal, 2020).

Participatory land use planning is an opportunity to implement innovative models of sustainable development, promoting territorial "gestalts" of dynamic integration between society, territory, land and sea. Here we apply the ecocultural model of Berry (2020, 2017) who from a psychosocial perspective understands that individuals are shaped by their ecocultural niches. Their knowledge, feelings and habits are developed from an adaptation (more or less successful) with their ecocultural contexts. In light of the above, we apply this concept, understanding that the successful adaptation of local communities with their ecological contexts is achieved when a reciprocity is achieved between the identity and the limits of the uses of the territory. We emphasize contexts in the plural because local communities act as connectors of contexts and when inter-adaptation is optimal, it is understood that they are also integrators of ecological contexts.

All this brings together the possibility of drawing strategic and psychosocially dynamic territorial vectors. Figure 1 shows an example based on the coast of Cantabria, Spain (Gandarillas, 2009).



Local knowledge

Conceptually local knowledge (LK) has been addressed for decades (eg Geertz, 1983). Flavier et al. (1995) define LK as the information base of a society, which facilitates communication and decision-making. Other authors define it as that knowledge gathered by a direct experience about the places within a territory, their qualities and how to relate to them (Gandarillas y Yagüe, 2008; McCall 2003; McCall, Martinez y Verplanke, 2015).

In the coastal context, it refers to a wide diversity of fields: the conditions and limitations of the land and the sea for productive activities, the spatial logic of buildings and settlements, transport routes, food production, local social organization and shared uses of the territory, equipment and other cultural resources, cultural industries, places and landscapes, etc.; all related to the territory (physical and psychosocial). Most of local knowledge is developed through adaptive relationships with "places", building a "tradition of wisdom" (Gaudiani, 1999; Heckler 2009; Lewicka, 2011). Therefore, it represents psychosocial, cultural, political, historical, educational, economic and ecological values related to the territory.

Considering the above, it can be argued that the impoverishment of LK and local cultural practices generates problems of social, cultural, economic and ecological degradation (Gandarillas, 2009), such as:

- Reduction of collective capacities to adapt to the local habitat, guarantee its preservation and sustainable exploitation, thus widening the gap between society and the territory and making integration difficult;
- Demotivation before the participation of the community in the protection of cultural and natural values, causing a progressive deterioration of traditional constructions, materials, diversity of land uses and landscapes;
- Depreciation of the territorial values of the local community, which can reduce collective self-confidence, identity, cohesion and community competencies for resilience in economic crises;
- Psychosocial vulnerability to environmental degradation and climate change;
- Reduction of the potential of the added value of the territory in local products and in tourism (Boissevain y Selwyn, 2004; Riensche et al 2015).

Value chains based on local knowledge can function to connect different places and regions (Arenas, 2003) as spatial vectors of socio-economic and territorial development and intercultural integration. The LK houses different values:

- LK develops within the territory through intergenerational adaptation that draws vectors of social development through space and time (Gandarillas, 2009; Manzo, 2005).
- LK develops in the local community through activities, institutions and individual and collective companies in close and continuous relationship with specific places. It is an endogenous resource linked to local forms of social development and therefore often facilitates community participation in development initiatives (Recasens, 2000).
- LK is a "raw material" for social innovation and collective intelligence. Improving and developing “local knowledge” by sharing it and fusing it with formal, scientific or global knowledge, fosters collective creativity and innovation for socio-cultural and economic companies (Hess, 2006). All of this should strengthen mutual trust and support, social cohesion and inclusion, cooperation and social capital, self-esteem and collective empowerment (Mairal y Gandarillas, 2005).

The LK forms the basis of local practices that relate different spaces. It is an innate and sustained knowledge, identifies problems of immediate importance, and shares information in a language with which the inhabitants of a region are familiar (McCall, 2003). Local practices are part of the human ecosystem, contributing to "weave" the territory and articulate its resources. For this reason, it is a strategic resource to reintegrate fractured or abandoned spaces, for example, along the routes and traditional movements that usually run perpendicular to the coasts (Gandarillas, 2009).

LK is also a potentially significant economic resource. It reports on the practical knowledge of the local population to exploit natural and cultural resources in a more sustainable way, their visions of the territory and the opportunities that at the micro level, can generate synergies in a global scenario. It can be aligned with current business trends in the collective economy and inter-organization networks in value chains. It can support a diversified and decentralized economy, with a high potential for the development of projects between companies. Digital solutions that provide greater transparency and traceability in the production and distribution of the product can better adapt to its local qualities and connect with end customers, generating new information and knowledge frameworks based on big data, as well as other emerging technologies such as blockchain.

Short supply chains based on local knowledge better connect the specific qualities of the territorial origin of products and customer demands. In the case of the food sector, they facilitate the involvement of the client in the value chain (both adding value with their

participation and knowing the different values of the product and production process), in the evaluation of quality and traceability, and in the preservation and improvement of territorial (food) values. This adds value to the product and greater customer loyalty.

In light of the above, LK is the basis of a place-specific collective intelligence that fits well with the vision of a knowledge society to overcome social and economic crises (for example, Bombiella, 2016; Gómez-Pallete, 1997; Innerarity, 2013; Madanipour, 2013), providing knowledge maps for management and development.

Synergies between natural and human landscapes in integrated coastal systems

The geography of water in the form of rain, rivers, and seas shapes the coastal landscape in valleys, estuaries, and coasts with nested, adapted, and integrated ecosystems, human habitats, and human cultures. The objective of the integrated co-creation of space depends on the search for the participation of all agents with their different knowledge and experiences applied to territorial governance, to offer an integrated mapping of the territory and its dynamics. Reflecting the integrative power of water, participatory governance models can propel the natural dynamics of ecosystems as guidelines and drivers of sustainable development, in line with the approaches recommended by the UN (Coates et al., 2018; Ros-Tonen et al., 2018) and offering strategic alternatives aligned with the Blue Economy, in the case of coastal areas. Many coastal regions with a strong network of small and medium-sized businesses and local communities show a great capacity to develop their endogenous potential, enhancing capital social through the collective and interorganizational management of knowledge and promoting a symbiosis between economic groups and the territory (Duarte, Doherty y Nakazawa, 2017).

The high cultural and ecological diversity in many coastal regions is reflected in the wealth of local knowledge, which adds cultural, historical, natural, educational and tourist values to products and services (Đokić, Radivojević, y Roter -Blagojević, 2008; Meyer-Stamer, 2004; Holmén, 2017; Sijtsma, Mehnen y Rojas 2019). It is possible to exploit this wealth and diversity of knowledge underlining the differential value of your products in a quality international market. Integrated coastal spatial management strengthens the connection between stakeholders in land and maritime activities, based on mutual learning and co-production of integrative projects.

For all the above specified, the present study proposes a methodology for spatial development planning, for reconfiguration of maritime-terrestrial space of the coastlines, based on an ecocultural integration. It is based on integrated micro-scale cartographies that incorporate the natural and cultural values of land and sea. From the perspective of policy and program design, it also involves a territorially broader participatory governance methodology that involves all relevant actors in the fusion of local and scientific knowledge for the co-creation and co-production of initiatives and services.

The process will define ecocultural maps for integrated maritime-terrestrial coastal planning, including strategic drivers of sustainable development. In this sense, one of the main objectives will be the preservation and promotion of eco-cultural areas, lines and networks of connection and vectors, so that sustainable development extends to coastal regions following the land-water dynamic. This includes the promotion of the Blue Economy supported by projects within value chains and networks, in turn based on local knowledge as producers of knowledge, innovation and development.

Study methodology

The structure of the Ecocultural Land Management (ELM) model was initially developed using participatory tools with 650 experts, researchers, policy makers, workers and citizens, most of them belonging to the research project "Litoral Ecocultural" (defined in Gandarillas, 2009) in Cantabria, Spain. For the present study, experts and researchers from the Netherlands, the United Kingdom, Italy, Greece, Spain and Brazil participated in the development and evaluation of the methodology, which is based on the following steps:

- A participatory analysis of planning needs and problems on different coastlines;
- A participatory study of ecological, social and cultural resources that was used to meet planning needs and address challenges to be addressed.
- A study of good innovative practices in spatial planning. Topics included participatory planning using GIS technologies, mapping research related to tangible and non-tangible heritage, participatory knowledge management tools, "green" / "blue" economies, and "interpretive" value chains.
- A participatory analysis of how good planning practices can be used effectively to meet localized needs and address current challenges in coastal areas (sustainable urban development, deployment of services in rural settings, preservation of environmental resources, economic promotion, etc..). The analysis tried to include the best elements of these practices based on the evidence of their effectiveness.
- A final validation of the ELM methodology by planning experts, scientific researchers, policy makers, workers and citizens.

Results: A dynamic and integrating model of coastal spatial planning

Phases of the ecocultural territorial organization methodology

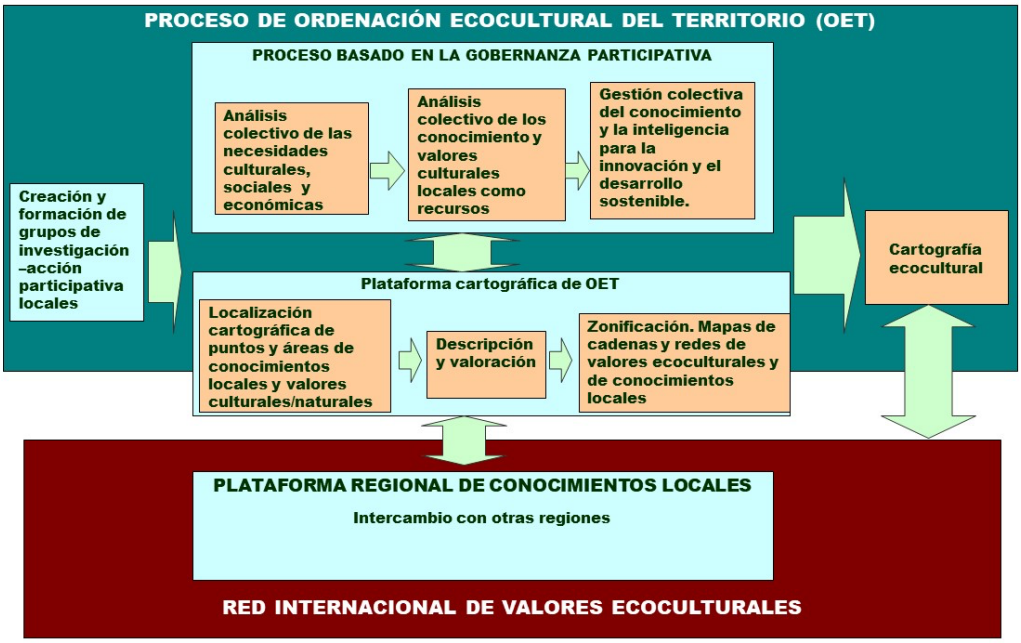


Figure 2. Schematic representation of the methodological process of ecocultural planning of the territory.

Figure 2 shows a representation of the ELM model development procedure, based on four stages::

1. Identification of indicators: establishment of a collaborative evaluation process. In addition to the usual coordination, management and planning teams, local steering groups (made up of stakeholders) and end-user groups are needed. The evaluation procedure uses a participatory and continuous co-design approach. Process, output and impact indicators should be defined with all project participants and stakeholders, including the knowledge of local people and external experts. Within this framework, a System of Ecocultural Indicators is generated to evaluate cultural and natural elements based on the criteria of significance, uniqueness, representativeness and level of preservation.

2. Identification of spatial units: use of participatory surveys and maps. A cartographic analysis is carried out in the selected coastal zone to identify all the spatial sectors in each territory. These sectors are established as the basic spatial units for mapping and planning, and will be defined by their differentiated uses and cultural and ecological characteristics. Also due to the institutional design associated with its management and the competency frameworks established by the multilevel government in each case. Units should be initially identified and described through bibliographic research on previous studies, official cadastres, field work and meetings with public and private actors, groups and local communities, collecting data on the Ecocultural Indicators System. Information on these spatial units can be continuously fed back through participatory research, expanding and improving the resource databases with new records.

3. Implementation of a digital platform for collaborative knowledge. The Platform is based on participatory WebGIS tools to map and systematically disseminate all the cultural and natural characteristics related to the units defined in the territory, using collective collaboration tools and VGI. The application can be freely downloaded from the project site to any electronic device. The application should include a set of questions about each unit: tangible and non-tangible cultural and natural characteristics, local knowledge of uses and practices, any known plans or projects, and elements of the Ecocultural Indicator System. Informants can complete the application and the information will be automatically recorded in local databases and processed in different geographic layers. The application can allow access to all local databases and maps using cloud computing tools. This digital solution must be continually updated with new information provided by stakeholders and citizens. It also includes tools for the exchange of information, experiences and evidence of good practices in the territories participating in the Regional Knowledge Management Platform. The Platform must be a dynamic open access tool that reflects interconnected territories and must pay special attention to the needs and opportunities to scale its structure and functionality with new solutions (interoperability, big data, etc.).

4. Spatial planning based on participatory governance. It is necessary to carry out a collective process in parallel to the implementation of the Platform, with continuous feedback (see Figure 2) and the participation of all the parties involved (local and regional institutions, community leaders, companies in the maritime and land fields, educators, researchers and planning experts). In addition, this strategy should include a program of methodological training to the local steering groups. On the other hand, participatory GIS techniques are used to map needs, problems and existing resources for the achievement of sustainable development. Group dynamics should be used to promote creativity and

innovation, since the exchange of this local and scientific knowledge should contribute new knowledge, ideas and collective projects for social, ecological and territorial development. Likewise, the strategies that allow continuity to the work spaces and tools must be taken into account, strengthening the strategic vision of these groups to guarantee a stable and balanced participation, incorporating new challenges associated with the redesign, monitoring and evaluation of the model. Based on this collective process, a cartographic zoning is constructed that shows the different levels of ecological and cultural protection, socioeconomic activities, and eco-cultural corridors.

These areas define territorial value chains and networks based on local knowledge, especially those that link marine and terrestrial spaces. The collective work is merged into *Ecocultural Plans* that are applied to each territory, including synergistic strategic vectors for spatial planning and development of the maritime-terrestrial sector. All the information in this process must be continuously fed back through the digital platform, consolidating a scalable repository of the work of all the groups involved. It is necessary that there be a continuous exchange of information and experiences between all the groups of the participating territories using the Regional Knowledge Management Platform, thus creating an ecocultural network. Ecocultural cartography allows merging the spatial construction of each territory as an integrated strategy that allows coordinating various planning actions, generating regional impacts and returns.

Examples of sustainable development cases based on ecocultural value chains and local knowledge

The following projects under construction are examples of cases in Cantabria and other European regions, as a result of the methodology presented here:

Remodeling of traditional mills of rivers and seas (Cantabria, Spain)

This example aims to recover traditional flour production and agricultural value chains in a region marked by estuaries, where the wheat farming system flourished but disappeared, transformed into a livestock mono-production that wiped out the richness of culture agricultural and affected the quality of the water of the rivers. Today, with new challenges for the livestock sector (increased demand for zero kilometer products, agro-tourism, etc.), the reactivation of new techniques can bring opportunities for local economies and job creation. These mills could be remodeled and reused to improve gastronomy and traditional local products and, potentially, the generation of energy from clean sources. Added to this, there are the EU's political priorities and the alignment of these resources with the key actions for the implementation of the 2030 Agenda and the achievement of the Sustainable Development Goals (SDGs).

Ecocultural Centers and Parks (Cantabria, Spain)

In many coastal regions there are traditional huts, fundamental elements of cultural landscapes, today they are threatened because their use has drastically decreased due to modern agriculture and rural depopulation. The remodeling of the cabins and fields in centers and parks for research and ecocultural conservation could be a partial solution to preserve this heritage. Ecocultural parks are managed to combine ecosystems with traditional subsistence and cultural uses. In addition, the food and artisan industries that are marketed to residents, agrotourists and final consumers, are examples of short food chains, providers of zero kilometer products, sustainable and socially responsible.

Coastal Ecocultural Wheels (Palermo, Italy)

These "wheels" propose (re) imagining and co-creating the ecological interior of coastal cities, connecting terrestrial and maritime territories where there are now visible and latent fractures, but fragmented, such as peri-urban areas, urban public green areas, parks, peri-urban orchards and coastal spaces with traditional activities. Local value chains for land and sea activities synergistically integrate local markets at the center of the wheel, driving green and blue jobs, as well as awareness among the population.

Local Wisdom MaPP (Northumberland Coast, England)

With this approach, a free access application is being designed and distributed with an interactive map of local knowledge and traditional practices in tourist centers, through websites aimed at tourists visiting coastal areas that disseminate the natural and cultural heritage. The application can enable "local wisdom routes", connecting application users with local producers and establishments and promoting active participation in agricultural and coastal value chains in line with cultural and nature conservation

Restoration of the mounds (Meuse river, Rhine delta, Netherlands)

In the river delta of the Netherlands, denatured by human development with mounds of houses, dikes, locks and windmills, which function as buffers for the sea, the "Room for the River" program restores an ancient eco-cultural tradition based on elevated dwellings. These are mounds for farms and agricultural buildings that allow the promotion of a new agro-industrial model aligned with the ecological management of climate change and its mitigation (Warner et al. 2012). The new raised mounds are like traditional terrains, while the field areas can be safely flooded due to flooding from the river. In addition, the model allows the incorporation of technological innovations that will allow the control of resources and the monitoring of production, promoting agriculture 4.0.

Coastal salt flats, (Spain)

The protection and management of the cultural and natural values of the maritime salt flats, such as those of the Ebro and Guadalquivir deltas, can reactivate old value chains and enhance these areas within their territorial framework. The Guadalquivir delta and the river up to its section in Seville show exceptional history, culture and ecology, but today the salt flats are extremely fragmented and many are ecologically and economically degraded. Restoring historical and cultural value chains selected to promote the trade of products and tourism along the river can act as a motor, linking the territory with economies of scale from an integrated perspective of the territory.

Local knowledge of archaeological sites such as cultural landscapes (Cerdeña)

An example of the use of participatory knowledge management with the support of ICT is the Geoportal Nurnet, a web platform to share local knowledge about the Nuraghe culture on the island of Sardinia (Spanu et al., 2017). This platform is presented as a tool to share, validate and take advantage of local knowledge and is a guide to megalithic structures, nuraghe towers, dolmens, domus and wells. It is a content generated by the user in the portal. The data is presented in an online model for three types of stakeholders: local communities and visitors who can insert and update data using Google and Open Street Map, experts who assess the quality of the data, and stakeholders who can consult this data. (tourists, neighbors, researchers, institutions, etc.).

Discussion and conclusions: Water as a teacher of sustainable spatial planning

The maritime-land planning approach presented here is based on a deep understanding of the factors (challenges, barriers and resources) that affect the territory. Sustainable development, supported by local and scientific knowledge, is based on the dynamic integration between ecosystems, society, between culture and territory. This integrated maritime-terrestrial ecocultural approach can counteract current trends in negative impacts derived from urban and industrial development on the coastlines. This methodology offers opportunities to bring together local knowledge and scientific knowledge through a governance and co-production approach that includes all stakeholders and, therefore, enables a wider range of joint actions, effective impacts and legitimacy. The opportunities of this model are also maximized with the integration of new digital solutions of different dimensions (big data and knowledge generation, integration of management tools in a multilevel government context through the interoperability of new solutions, blockchain, etc.). The model provides the tools and products, including participatory knowledge collection and sharing, participatory mapping, land-sea spatial plans, and integrated coastal management modalities.

Heterogeneity and synergy of water

There is the potential for transfer and expansion to coastal regions, based on the diversity of local cultures as a potential resource for sustainable development and adaptable to new contexts, and on the connection of communities and territories in a globalized context. The connectivity between eco-cultural landscapes facilitates this expansion and extension on the coastal coastline and along the rivers. The geography of water is understood here as the great teacher that shows us the vectors of ecocultural development. The diversity of elements, processes and spaces that make up a territory made up of water implies a strong ecological and cultural heterogeneity, a central characteristic of its multifunctional and integrating heritage of spaces.

The LK illustrates the potential of general interdisciplinary methodologies that describe and analyze the interactions between social, institutional, cultural, economic and ecological systems, for dynamic spatial planning and sustainable development based on endogenous resources, including the challenges of climate change. The integration of local and scientific knowledge, using interdisciplinary processes, brings with it powerful synergies that lead to strategies based on the territory (Yli-Pelkonen y Kohl, 2005).

For example, merging maritime and terrestrial value chains to counteract the negative externalities of urban development along the coast can create maritime-terrestrial eco-cultural corridors, by zoning areas of protection and cultural, natural and eco-cultural uses that link the sea and earth. Ecocultural corridors can function as cultural and ecological connectors and drivers for development, as projected vectors along the coasts at the national and continental level. Conventional political-administrative territorial segmentation damages the capacity for self-preservation of the cultural ecosystem, because it reduces its diversity and geographical extension. Connecting "ecocultural" spaces magnifies the power of cultural ecosystems. The ecocultural cartography, prepared for maritime and territorial planning, includes intersection strategies (mapped in territorial value chains) in blue-green territories, drawn on the plans of each territory. This offers a dynamic network of integration between society and territory as drivers of change and territorial development, providing territorial cohesion and facilitating coordination between governments and public administrations.

In summary, the approach presented in this study shows the viability and recommendation of dynamic territorial planning through an ecocultural mapping focused on the integration of society and the ecosystem, thus promoting sustainable development.

Finally, this approach also facilitates the adaptation and extension of eco-cultural plans along the coasts and back to the watersheds. This methodology can be used in itself as the main basis of work in spatial planning processes, but it can also be used as a basis for strategies that focus on sustainable and integrated development.

References

Berry, J. W. (2019). Ecocultural Psychology. *Cultural-Historical Psychology*, *15*(4), 4-16.

Berry, J. W. (2017). Theories and models of acculturation. *Oxford library of psychology. The Oxford handbook of acculturation and health*, 15-28.

Arenas, J.J. (2003). *Patrimonio y sociedad civil. En AM Romanillo (Ed.): Patrimonio Cultural y Patrimonio Natural. Una Reserva de Futuro*. Santander: Fundación Marcelino Botín.

Bombiella, H.A. (2016). Thinking small: The United States and the lure of community development. *Community Development, 47* (4), 574-575.

Coates, D., Connor, R., Cordeiro, A.R., Uhlenbrook, S. & Koncagül, E. (2018). Realizing the potential of NBS for water and sustainable development. In: *The United Nations World Water Development Report 2018: Nature-based solutions for water.*

Constanza, Cullen, Sandhu & Wratten (2013). *Ecosystem Services in Agricultural and Urban Landscapes.* Oxford: Wiley-Blackwell.

Duarte, F., Doherty, G., & Nakazawa, P. (2017). Redrawing the boundaries: planning and governance of a marine protected area—the case of the Exuma Cays Land and Sea Park. *Journal of Coastal Conservation*, *21*(2), 265-271.

Flavier, J.M. et al. (1995). The regional program for the promotion of indigenous knowledge in Asia. pp. 479-487 in: Warren, D.M., L.J. Slikkerveer and D. Brokensha (eds) *The Cultural Dimension of Development: Indigenous Knowledge Systems.* London: Intermediate Technology.

Gandarillas, M.A. (2009). *Ecocultural Litoral: The Cultural and Natural Heritage as Resource for a Sustainable Development of Cantabria Coast*. Santander (España): EcoCulturas.

Gandarillas, M.A., & Yagüe, R. (2008). The role of local knowledge networks in territorial development in the countryside of Segovia. *Investigaciones Geográficas*, *47*, 71.

Garcia-Martin. M., et al. (2017). Participatory mapping of landscape values in a Pan-European perspective. *Landscape Ecology*, 3-2(11), 2133-2150.

Gaudiani, C.L. (1999). La sabiduría como capital en comunidades prósperas. En F. Hesselbein, M. Goldsmith, R. Beckhard, y R.F. Schubert (Comp.): *La Comunidad del Futuro*, pp. 85-97. Barcelona: Granica.

Gómez-Pallete, F. (1997). *Cantabria, en el Umbral de un Nuevo Ciclo. 2025, Un marco competitivo para Cantabria, 14*, 35.

Graziano, T. (2017). Citizen e-participation in urban planning: Achievements and future challenges in a Mediterranean city. *International J. of E-Planning Research (IJEPR)* 6 (3).

Hess, C.G. (2006). Knowledge Management and Knowledge Systems for Rural Development. In: *Reader: GTZ Knowledge Management. GTZ Sector Project Knowledge Systems in Rural Development*. Retrieved from www.gtz.de/agriservice

Hall, P. & Hesse, M. (2013). *Cities, Regions and Flows*. London & New York: Routledge.

Harrison, J. & Hoyler, M. (Coord.) (2015). *Megaregions. Globalization´s New Urban Form?* Edward Elgar.

Holmén, J. (2017). Mapping historical consciousness: mental maps of time and space among secondary school students from ten locations around the Baltic and Mediterranean seas. *Autonomy and Security*, *1* (1), 46–74.

Innerarity, D. (2013). *The Democracy of Knowledge*. Bloomsbury.

Inwood, H., Wharton, A., & Davies, H. (2015). *Integrating Cultural Values and Services in Landscape and Ecological Planning.* Retrieved from http://www.researchbox.co.uk/documents/4_wild_thing_conference_paper_v11.pdf

Ivanova, A. et al. (2017). La economía azul como modelo de sustentabilidad para estados costeros: el caso de Baja California Sur. *Sociedad y ambiente*, (14), 75-98.

Kenchington, R.A., & Day, J. C. (2011). Zoning, a fundamental cornerstone of effective marine spatial planning: lessons learnt from the Great Barrier Reef, Australia. *Journal of Coastal Conservation*, *15*(2), 271-278.

Krost, P., Goerres, M., & Sandow, V. (2018). Wildlife corridors under water: an approach to preserve marine biodiversity in heavily modified water bodies. *Journal of Coastal Conservation*, *22*(1), 87-104.

Lewicka, M. (2011). Place attachment: How far have we come in the last 40 years? *Journal of Environmental Psychology*, *31*(3), 207-230.

Madanipour, A. (ed.) (2013). *Whose Public Space? International Case Studies in Urban Design and Development*. New York: Routledge.

Mairal, P., & Gandarillas, M. (2005). Más allá de la sustentabilidad. Una propuesta ecocultural. In: F.J. Garrido (Coord.): *Desarrollo Sostenible y Agenda 21 Local. Prácticas, Metodología, y Teoría*, pp. 79-86. Madrid: IEPALA Editorial –Cimas

Mairal, P., Pastor, G., y García, M.J. (2015). Gobernanza local: retos y oportunidades, en Gandarillas, M.A. y Cueva, A. (Coord.): *La Gobernanza de la Seguridad y Justicia en la Sociedad Diversa*. Arganda del Rey: Ayuntamiento de Arganda del Rey, 25-40.

Mairal, P. (2020). Innovación pública: factores clave en los procesos de innovación en el sector público local. *Cuadernos de Gobierno y Administración Pública*, *7*(1), 53-61.

Manzo, L.C. (2005). For better or worse: Exploring multiple dimensions of place meaning. *Journal of Environmental Psychology*, *25*(1), 67-86.

Makhzoumi, J., Chmaitelly, H., & Lteif, C. (2012). Holistic conservation of bio-cultural diversity in coastal Lebanon: a landscape approach. *Journal of Marine and Island Cultures*, *1* (1), 27-37.

McCall, M.K. (2003). Seeking good governance in participatory-GIS: a review of processes and governance dimensions in applying GIS to participatory spatial planning. *Habitat International, 27*, 549-573.

McCall, M.K., Martinez, J., & Verplanke, J. (2015). Shifting boundaries of volunteered geographic information systems and modalities: Learning from PGIS. *ACME*, *14*(3), 791–826.

Meyer-Stamer, J. (2004). *Governance and Territorial Development: Policy, Politics and Polity in Local Economic Development*. Meyer-Stamer.

Olwig, R. (2017). Landscape: the thing about Landscape´s Nature: Is it a creature/monster of the map?, en Brunn, S.D. y Dodge, M. *Mapping Across Academia, Springer,* 209-222.

Pastor Albaladejo, G., Sánchez Medero, G. y Mairal, P. (2020). Nuevo servicio público y gobierno abierto: enfoques para democratizar la gestión pública, en Aldeguer, B. y Pastor Albaladejo (Dir.) *Democracia, Gobierno Abierto y Administración pública contemporánea*. Madrid: Tecnos, 144-150

Pauli, G., y Leal, A.G. (2011). *La economía azul: 10 años, 100 innovaciones, 100 millones de empleos: Un informe para el Club de Roma*. Tusquets: Barcelona.

Petri, R., (ed.) Maritime areas: spaces of changing expectations. *Comparativ*, 26 (5) 7–75.

Plieninger, T. et.al. (2018). Identifying and assessing the potential for conflict between landscape values and development preferences on the Faroe Islands. *Global Environmental Change, 52*, 162-180.

Rawat, P., & Yusuf, J. E. W. (2020). Participatory Mapping, E-Participation, and E-Governance: Applications in Environmental Policy. In *Leveraging Digital Innovation for Governance, Public Administration, and Citizen Services: Emerging Research and Opportunities* (pp. 147-175). IGI Global.

Recasens, A. V. (2000). La crisis del desarrollismo y el surgimiento de la antropología del desarrollo. In Viola (coor.), *Antropología del Desarrollo. Teorías y Estudios Etnográficos en América Latina,* (pp. 9-64). Barcelona: Paidos.

Riensche, M, et. al. (2015). Tourism at Costalegre, Mexico: an ecosystem services-based exploration of current challenges and alternative futures. *Futures.*

Ros-Tonen, M. A., Reed, J., & Sunderland, T. (2018). From synergy to complexity: the trend toward integrated value chain and landscape governance. *Environmental Management, 62* (1), 1-14.

Schilleci, F. (Coord.) (2012). *Ambiente e Ecologia. Per una Nuova Visione de Progetto Territoriale*. Milano: Franco Angeli.

Sijtsma, F.J., Mehnen, N., Angelstam, P. & Muñoz-Rojas, J. (2019). Multi-scale mapping of cultural ecosystem services in a socio-ecological landscape: A case study of the international Wadden Sea Region. *Landscape Ecology,* 1-18.

Smith-Godfrey, S. (2016). Defining the blue economy. *Maritime affairs: Journal of the national maritime foundation of India*, *12*(1), 58-64.

Smith, H.D., Maes, F., Stojanovic, T.A., & Ballinger, R.C. (2011). The integration of land and marine spatial planning. *Journal of Coastal Conservation*, *15*(2), 291-303.

Spanu, V., Lorrai, E., Muscas, L., & Demontis, R. (2017). Nurnet-geoportal. *Archeomatica International, 8*(3), 26–29.

Tengberg, A., Fredholm, S., Eliasson, I., Knez, I., Saltzman, K., & Wetterberg, O. (2012). Cultural ecosystem services provided by landscapes: assessment of heritage values and identity. *Ecosystem Services*, *2*, 14-26.

Verplanke, J., McCall, M. K., Uberhuaga, C., Rambaldi, G., & Haklay, M. (2016). A Shared Perspective for PGIS and VGI. *The Cartographic Journal*, *53*(4), 308–317. doi: 10.1080/00087041.2016.1227552

Voinov, A. et al. (2016). Modelling with stakeholders - next generation. *Environmental Modelling and Software, 77,* 196-220.

Warner, J.F. et. al. (2012). *Making Space for the River*. IWA publishing.

Yli-Pelkonen, V. & Kohl, J. (2005). The role of local ecological knowledge in sustainable urban planning: perspectives from Finland. *Sustainability: Science, Practice & Policy*, *1*(1), 3-14.

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