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A conceptual framework to promote wetlands ecosystems management in strategic environmental assessment

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ABSTRACT

Despite numerous efforts across the years, the wetlands are still among the most threatened ecosystems around the world, since 1700 CE, 87% of global wetland area might have been lost. The Convention on Biological Diversity and Ramsar Convention established agreements to deal with this issue. In this context, policies can assist the decision making to meet those international agreements during the development process. In this sense, Strategic Environmental Assessment (SEA) of plans, programs, and policies contribute to verify actions implications and possible alternatives for promoting environmentally sustainable development. Here we developed a conceptual and general framework to insert the wetlands ecosystems effectively in the SEA developing process. The designed framework has five steps: (i) wetlands and developing process, (ii) priority wetlands and their assessment, (iii) evaluating impacts on wetlands and identifying sustainable alternatives, (iv) alternatives comparing and (v) strategic action monitoring and follow up. The conceptual structure has a great potential for wetlands protection and safeguards their ecosystem services, contributing in this way for the attendance of Conservation on Biological Diversity and the Ramsar Convention strategic goals at the local level. It is necessary that the administrative levels take as a premise the need for promoting wetlands conservation and provide resources for the application of proposed approaches related to SEA.

Keywords: Aquatic Ecosystem; Environmental Policy Instrument; Planning; Sustainable Development.

Uma estrutura conceitual para promover o manejo dos ecossistemas de áreas úmidas na avaliação ambiental estratégica

RESUMO

Apesar de numerosos esforços ao longo dos anos, as áreas úmidas ainda estão entre os ecossistemas mais ameaçados do mundo, desde 1700 A.C., 87% das áreas úmidas globais podem ter sido perdidas. A Convenção sobre Diversidade Biológica e a Convenção de Ramsar estabeleceram acordos para lidar com esta questão. Nesse contexto, as políticas podem auxiliar a tomada de decisões a cumprir esses acordos internacionais durante o processo de desenvolvimento. Nesse sentido, a Avaliação Ambiental Estratégica (AAE) de planos, programas e políticas contribui para verificar as implicações das ações e possíveis alternativas para promover o desenvolvimento ambientalmente sustentável. Uma estrutura conceitual e geral foi desenvolvida para inserir efetivamente os ecossistemas das áreas úmidas no processo de desenvolvimento da AAE. A estrutura projetada possui cinco etapas: (i) áreas úmidas e processo de desenvolvimento; (ii) áreas úmidas prioritárias e sua avaliação; (iii) avaliação de impactos nas áreas úmidas e identificação de alternativas sustentáveis; (iv) alternativas de comparação e (v) monitoramento de ações estratégicas. A estrutura conceitual tem um grande potencial para a proteção de áreas úmidas e salvaguardar os seus serviços ecossistêmicos, contribuindo dessa maneira para o atendimento dos objetivos estratégicos de Conservação da Diversidade Biológica e da Convenção de Ramsar em nível local. É preciso que os níveis administrativos tomem como premissa a necessidade de promover a conservação de áreas úmidas e fornecer recursos para a aplicação das abordagens propostas relacionadas à AAE.

Palavras-chave: Ecossistemas Aquáticos; Instrumento de Política Ambiental; Planejamento; Desenvolvimento Sustentável.

Introduction

Wetlands ecosystems play a crucial role in the maintenance of biological diversity and ecological integrity; however, these systems have faced a growing process of environmental degradation in detriment of human activities, which is responsible for uncontrollable changes (e.g. eutrophication, pollution, contamination, structural changes, hydrological cycle changes) (Quintela et al., 2019) in its structure and metabolism. Recent estimates show that the remaining coastal and inland wetlands occupy a total area of approximately $12,1 \times 10^6$ km² (Davidson et al., 2018).

Despite providing a variety of benefits to humankind (i.e. ecosystem services), wetland ecosystems are classified as one of the most natural systems threatened by anthropic activities, either globally or regionally (Silva et al., 2019). Davidson (2014) points out that approximately 87% of global wetlands were lost, a situation that occurred most intensely during the 20th century. Agribusiness and the intense process of urbanization can be considered as the main direct drivers of conversion and environmental degradation of wetland ecosystems, given the changes that occur in landscape cover and the naturalness loss.

Given the importance of water quality maintenance for the functioning of ecosystems and the no consideration of the dynamics of the aquatic environment by public policies focused on water resources management, the recognition, and integration of wetlands in decision making is necessary for the maintenance of society and associated biodiversity (Xavier et al., 2019). Moreover, climate change can lead to the decline of wetlands, a situation that requires strategies that favor the management and conservation of these ecosystems over a long-term horizon (Sofaer et al., 2016). Due to the strong relationships between watershed integrity, anthropogenic interference and the provision of ecosystem services, the adoption of adaptive strategic management (Flotemersch et al., 2015) focused on wetlands is necessary.

Front of the observed scenario, it is notorious that States still fail to effectively protect wetlands and comply with the provisions of documents arising from international agreements, such as the Ramsar Convention (e.g. Strategic Plan 2016 - 2024) and the Convention on Diversity. Biological (e.g. Aichi Goals). Many factors can be listed regarding the ineffectiveness of the protection granted to wetlands, among them highlight the problems related to authority, institutional failures, low resources investments,

political willingness, corruption, conflicts of interest, and economic aspects (Velez et al., 2018).

When it comes to Brazil, formalized international agreements to protect wetland ecosystems appear to be disregarded by the government, given the adoption/implementation of measures that go against the policy content and favor the development of human activities (Lima Júnior et al., 2016). The country has two of the largest and most important pristine wetlands (Amazon Basin and the Mato Grosso Pantanal), nonetheless, 64% of these ecosystems have been lost and the degradation rates are alarming (PBM/ BPBES, 2019). This situation tends to worsen, since Native Vegetation Protection Law (Federal Law n° 12,651/12), a mechanism that deals with protectionist aspects related to terrestrial ecosystems and their interfaces, is marked by several critics (e.g. Brancalion et al., 2016; Grasel et al., 2018; Grasel et al., 2019) and favors the development of agribusiness activities, as the wording is less restrictive in some respects and more permissive in others (e.g. the flood pulse is not considered in the delimitation of permanent preservation areas), which may compromise the integrity of the wetland ecosystems.

Strategic Environmental Assessment (SEA) emerges as an alternative to assist and collaborate with the maintenance of these ecosystems, preserving the ecosystem services provision and promoting the landscape cover ordination to reduce adverse impacts. In the literature, several authors stand out how the SEA can assist the planning of the physical environment, promoting sustainable development, and enabling balanced ecosystem functioning through adequate management (e.g. Kumar et al., 2013; Xu et al., 2016; Noble and Nwanekezie, 2017; Rozaz-Vásquez et al., 2017). According to Velez et al. (2018), ecosystem-based management can be of great value for the maintenance of processes that occur in wetlands, as well as may favor the maintenance of their functionality through a scientific basis.

SEA can assist in the management of wetlands at different levels of governance, which protects their socio-cultural and ecological characteristics, as well as the integration of natural resource management and ecosystem services into decision making (Hettiarachchi et al., 2014; Geneletti, 2015; Lavoie et al. 2016).

The degradation scenario experienced by wetlands, the constant failures that occur at different administrative levels, and the need to integrate these environments into the decision-making process demand the formulation of alternatives. Given the above, a conceptual

framework was developed to effectively insert wetland ecosystems into the process of conducting the SEA, considering the different contexts and based on the process-related steps. The main purpose is to assist the decision-making process regarding the application of public policies, considering the ecological characteristics of wetlands throughout the process. The present paper addresses those needs and integrates relevant policies to reduce impacts from development and consider the socio-ecological-values of wetlands ecosystems, expanding the SEA to the wetlands integrity maintenance.

Importance of the Wetlands Ecosystems

Wetlands are ecosystems characterized by being periodically flooded by water or having permanently saturated soils, that count with specific edaphic properties and harbor vegetation with adaptations focused on the spatial and temporal influence of water (Beuel et al., 2016; Hesslerová et al. 2016). Those systems are transitional areas between aquatic and terrestrial ecosystems (WPEM, 2009) and are recognized for their rich biodiversity, for a complex hydrological regime and for being the 'Earth's natural filters' because of their ability to remove potentially harmful compounds from water (Brinson, 1998; Zedler, 2003; Chen and Wong, 2016).

Several ecosystem services are provided by wetlands, such as water flow regulation, erosion control, greenhouse gas regulation, contaminant retention, biodiversity habitat, raw material supply, and recreation opportunities. (Chaikumbung et al., 2016; Silva et al., 2019). Wetlands also contribute to the reduction of nitrate and nitrogen concentrations through denitrification and absorption processes carried out by organisms such as aquatic macrophytes or microorganisms (Mitsch et al., 2005). The wetlands systems may have distinct characteristics, their chemical properties and processes are periodically changed due to periodic flooding (WPEM, 2009). Such hydric bodies have great ecological value and are responsible for water supply and their primary productivity serves as the basis for many species (Schuyt and Brander, 2004).

Wetlands ecosystems are considered important sites for maintaining biodiversity as they provide shelter and resources for many organisms at various stages of their life cycles, especially for ichthyofauna, which uses these areas as nurseries or places of refuge at various stages of their life development (Claro-Jr et al., 2004; Cunico et al., 2008; Luz et al., 2012).

Regarding human uses, Rebelo et al. (2009) stand out that many wetlands have as the priority use food production (e.g. rice production, fish supply), but many other services provided by these ecosystems meet other needs. Estimates reveal that one billion families living in Asia, the Americas, and Africa depend on these areas for their livelihoods (Ramsar Convention Secretariat, 2015). Despite their great importance for the maintenance of human activities and mankind's survival, the wetlands are among the most endangered ecosystems on the planet, continue to be drained and degraded (Forman, 2008; Nabahunu and Visser, 2011).

The integrity of aquatic ecosystems when compromised implies the loss of services provided by these ecosystems, changes in fauna and flora (e.g. phenology, behavior, population dynamics, community structure), as well as changes in evolutionary adaptation (Gong et al., 2010; Gilvear et al., 2013; Perring et al., 2013).

In tropical and temperate regions, many wetlands are facing a process of disappearing and loss of their health due to anthropogenic and natural processes, which often do not receive the necessary attention (Paul and Meyer, 2001; Mitsch et al., 2008; Gong et al., 2010; Sims et al., 2013). The patterns of landscape cover cause changes in the metabolism and functioning of these ecosystems, especially the urbanization process and agribusiness, responsible for natural areas conversion and pollutant input (Bassi et al., 2014). Given the great importance of wetlands for ecological processes and environmental services (Gabrielsen et al., 2016), management strategies should be designed to maintain the ecological integrity of these systems (Junk et al., 2012).

Material e methods

We assumed that strategic action (e. g. policies, programs, projects, and plans formulations) is an adequate approach to promote wetlands protection to change the actual scenario of degradation, environmental quality loss, and reduction area, as well as foment the conservation of these ecosystems and their associated biodiversity, elements required for international agreements and national mechanisms (i.e. public policies, legislation). Also is important to emphasize that the SEA can be inserted in the decision making, adopting an integrated environmental emphasis, and considering the application context (Oliveira et al., 2009). In the present work, we considered the best practice principles from the International Association for Impact Assessment (IAIA) and the classical phases

of the SEA. The methodological procedures involved in an adaptation of the approach adopted by Geneletti (2015) and during the different stages of the SEA, were proposed elements that contribute to consider the wetlands ecosystem during the planning and development process. The conceptual framework was formulated using key steps to integrate the SEA in wetlands ecosystem management, our approach considered previous experiences involved a classic content of SEA, wetlands governance and environmental services protection (Therivel, 2004; Geneletti, 2015; Hettiarachchi et al. 2014).

Results e discussion

Looking at a general approach, we include elements that will contribute to insert both national international public policies in the development context. The application of this framework can be re-designed to attend peculiar characteristics of

governments, auxiliary in decision-making, and promote wetlands protection in the administrative levels, mainly at the municipality sphere, where policies and plans are mostly applied effectively.

We designed a five steps framework to integrate wetlands management in the SEA context (Fig. 1) and avoid negative impacts from development on those systems, the framework allows integrate destine elements of national, regional and local governance, as well as international factors. The result also can help to mainstream wetlands ecosystem services in the decision-making process (Geneletti, 2015). First, overall, it is necessary to identify the existent sources that can effectively influence on the developing process, in this step, the elements from strategic action (e.g. policy, plan, programs) and legislation related with wetlands should be analyzed. This diagnosis reveals the elements affected by regulatory mechanisms and actions implementation and these elements need to be

Figure 2. A conceptual framework to integrate wetlands management in SEA

listed in the scope. An analysis considering wetlands uses by humans (e.g. economic, educational, and cultural) can be an initial point to develop this step. Previously learned experiences

also can help in the process and might auxiliary in the design of new strategies. There are open windows to insert international policies and take the information of public authorities. Also is

important considering the SEA institutional basis in each context.

The next step allows establishing wetlands areas with high ecological importance and the main environmental services provided by these ecosystems. On the other hand, it also is vital to identify the most threatened wetlands to protect ends. Ecological analyses are required, in this context, a partnership with academia is an alternative to wetlands priority classification to define its environmental quality status. Multidisciplinary contributes to considerer vital data, mainly in the social sphere and the importance of the environmental characteristics (e.g. fragility, issues).

The baseline formulation will make enable the obtainment of a picture that represents actual wetlands ecosystems situation and after will give support for the development and actions of the next step measures formulation.

The third step requires an expertise consultation; every benefic and adverse effect derived from a development plan must be considered and listed. For each identified scenario, environmental non-invasive measures should be performed with a focus on people's needs, ecosystem function, natural systems maintenance, and development promotion. Indicators to monitoring are an important element in this step, it enables us to see the effectiveness of adopted measures, but every selected indicator should be appropriate to evaluate the strategic goals in each scale, considering the strategic action context.

Alternatives comparing must be made after all the impacts election; here exists a link with environmental impact assessment and the baseline data. We strongly recommend the selection of alternatives that effectively mitigate the negative impact without modifying significantly the strategic actions and its goals, as well as reduce the environmental negative impacts on wetlands systems and their associated biodiversity. Prediction plays an important role once it reduces uncertainty and maximizes dichotomy in the decision-making process.

SEA applied to wetlands ecosystems requires a good understanding of this tool, so document quality evaluation is primordial to connect all decision levels, this assists in expected objectives evaluation in environmental governance (Fischer, 2010; Bina et al. 2011). In the final step, it should evaluate if the wetland ecological integrity was protected, and if that occurs the sustainable development promotion during the action implementation with indicators (e.g. Fischer, 2010). Public participation is an important aspect that offers a possibility to include some

essential socioeconomic characteristics, the vital needs of the stakeholders, and possible issues that do not were verified by experts. Problems can be avoided or simplified, and the wellbeing of the population has more chances to be assured. Also is important to create opportunities to favor public participation and adopt strategies that contribute to breaking possible existent barriers.

The employment of indicators supports the implementation of the key steps, by giving their ability to summarize information and auxiliary in its diffusion for the interesting ones. In SEA, indicators are a tool that is useful technically and communicatively (Gao et al., 2017). Thinking about the key-steps and objective information obtainment for the process monitoring, some indicators are shown in Table 1. The intent was to bring elements that simplify the structure implementation and maximize efforts designated for wetlands management, with the employment of elements that can reflect the goals attendance during the strategic action implementation.

Considering the first topic present in Fig. 1, is clear that the Step 1 (Table 1) can assure a great performance of the influence sources identification and involved public, given the quality criteria establishment and the contribution to englobe all the necessary normative mechanisms. About the second topic (Fig. 1), the Functional Assessment Procedures favor the ecosystem functions and metabolism evaluation of the wetlands, providing a base for identifying priority areas that should be protected or restored. Also is important to remember that the guidelines and the MACBETH methods are components that indicate the ecological integrity of wetlands ecosystems and possible disturbances. According to the third topic from Fig. 1, the impacts must be evaluated, Step 3 allows verify the extension of the impact and alternatives to minimize adverse impacts that will be occasioned by human activities development, which optimize the directed efforts and risks reduction (Table 1). However, it is necessary to prioritize the alternatives (fourth stage from Fig. 1), Step 4 (Table 1) auxiliary in this sense and support the establishment of development strategies in the different administrative levels and promote the wetlands conservation, especially those ones that, contributing to reduce harmful impacts and the attendance of the needs from society and biodiversity. Finally, the fifth topic (Fig. 1), grant the quality of the process evaluation and indicate if the implementation of the strategic action is contributing to wetlands perturbances or altering their quality, a situation that is easy pointed by limnological indexes and biota answer (i.e. biomonitoring).

Table 1. Indicators to assist the conceptual structure implementation.

Step	Indicator	Description	Reference
1	Qualitative score	Grade system based on work performance, where is possible to apply grades from A to G, according to the attendance quality of step components identify in each case	Fischer (2010)
2	Functional Assessment Procedures (FAP)	Provide the possibility of the user to determine ecosystem functions and environmental conditions of wetlands, indicating priorities areas and environmental key-characteristics (e.g. hydrogeomorphic delineation, biogeochemical functions, hydrological functions, Ramsar sites) necessary to the baseline and ecosystem services analyses with scoring manual use and reference list for codes.	WPEM (2009)
	Ecological value (MACBETH)	This method allows a multicriteria analysis process and provides the ecological values of wetlands after some adjust, as well as wetlands connectivity and integrity. There is possible to identify priority areas to management or protection and establish parameters for the multicriteria analysis	Lavoie et al. (2016)
	Guidelines and background values	Let establish a comparison between areas and adopted quality values for the limnological variables (e.g. metals concentrations, dissolved oxygen, pH) in water and sediment	E.g. CCME (1995); CONAMA Resolution nº 355 (Brasil, 2005); environmental agency regulations
3	Descriptive, analytical and/or involvement methods and techniques	Here is possible to determinate all the extension of the impact, as well as significant impacts and ways to mitigate them	E.g. Indicators (Sanchez, 2013), Impact Matrices (Fisher, 2007), Impact trees (Fisher, 2009), Geoprocessing (e.g. Silva et al. 2017), Ecological Risk Assessment (ARE), Ad hoc consultation
4	Tiering approach, Hierarchy of alternatives	The user can identify appropriate alternatives between administrative levels and attend real needs	E.g. Therivel (2004)
5	Performance criteria	Provide essential elements to verify the effectiveness of the SEA process, according to international criteria	IAIA (2002)
	Limnological indexes, models and community structure	Give information about the current state of the aquatic bodies, make easier the data divulgation and synthesize limnological information	E.g. Index of geoaccumulation (Muller, 1969), Water Quality Index (Cvetkovic & Chow-Fraser, 2011), Macroinvertebrate community structure (Hepp et al. 2010, Allan et al. 2012)

The structural approach allows protecting wetlands areas and promoting their sustainable use, safeguarding ecosystems services provision, and favoring biological conservation. That is expected the consideration of all pertinent policies, plans, programs, and projects during the strategic decision formulation, combined with previous experiences and strategic actions will contribute to wetlands management (Fig. 2) and change the scenario of loss and degradation.

Considering the challenge to deal with the fact that the Aichi targets (5 and 14) are having insufficient efforts (natural resources use increase, the limited scale for planning) to be achieved and the human pressure on ecological systems (deforestation, wetlands fragmentation, and degradation, ecosystem services loss and degradation) still is a problem at the list until 2020 (Secretariat of the Convention on Biological Diversity, 2014), new structures is necessary.

Figure 2. Strategic action and wetlands management

The environmental impacts evaluation involves uncertainties and considers all dimension is a hard task (Goulder and Parry, 2008), so public policies applied for regional scales can suffer the influence of sustainable elements and reflect in the decision-making process (Gibbs and Lintz, 2016), a situation that can favor wetlands ecosystems. The SEA consists of an adequate approach to promote wetlands management and protection, contributing to changes in the degradation scenario and environmental quality loss. The adopted environmental instrument policy has the potential to verify development action implications and alternatives to prevent human interference on the ecosystem's health (Bina et al., 2011; Doren et al., 2012).

Approaches based on SEA to protect wetlands is available on literature. For example, Li et al. (2014) demonstrated an integrative approach to verify the urban expansion impact from Lianyyungan (Jiangsu, China) on wetlands, contributing to decision-making and ecosystem management. Tok et al. (2015) demonstrated through landscape assessment in Enez-Kesan (Turkey) the role that legal tools and plans for the conservation of priority areas, including wetlands. Genelleti (2015) highlights the SEA potential to permeate decision-making levels and ecosystem services consideration.

The ecosystem services incorporation into planning sphere potentially contributes to adverse impacts mitigation and provide chances to safeguard ecosystems, once that the ecosystem services loss is a no reversible process (Gren and Anderson, 2018, Xie et al., 2018). The decision window may become an effective way to integrate

environmental and decision-making (van Stigt, 2013), a factor that favors the adequate wetlands systems maintenance and metabolism, essential elements for the provision of the ecosystem services.

The conceptual structure implementation subsidizes the incorporation of environmental variables and ecological aspects during the planning process, reducing in this sense the degradation and grant the ecosystem maintenance front of adequate conduction of the development process (Zulma and Nascimento Neto, 2015). Also, worth to be mentioned that the structure can avoid that decision-makers promote an inadequate use of those systems. Planners and other professionals that participate of the development process, generally, use the wetlands as wastelands and concede its exploitation and conversion in other land uses (Junk et al., 2014), the proposed structure reduces human interferences (e.g. eutrophication, pollutants/contaminants inputs, soil sealing) and safeguard the ecosystem services to society. It is possible to infer that will occur the maintenance of biodiversity integrity and the benefits can be obtained to human health, given potential risks reduction of metals contamination and their magnification through the food chain (Quintela et al., 2019).

The no contemplation of the interdependence and connexons that involve water and ecosystems is a regular practice of the public policies and management measures, so those factors need to be integrated to the decision making to attend development and environmental needs (Xavier et al., 2019), a situation that the academia can contribute through the elaboration of strategies

directed to conservation, population conscientization, the provision of detailed knowledge about the ecosystems and the creation of alternatives to incorporate the scientific information into administrative levels; avoiding misinformation and synergetic negative impacts (Smith et al., 2019)

The impact mitigation of human activities implies the strengthening of the services provided for the natural ecosystems (Goulding et al., 2018). Considering the environmental protection and development policies, the researches can propose mechanisms that allow integration of those factors to adopt a sustainable system according to the scientific knowledge and provide to decision-makers a panorama about the changes and possible associate lacks (Vélez et al., 2018), elements that prepare the optimization of the institutional capabilities and contribute to the proposed framework implementation.

The academia also can contribute to dealing with 'market failures' through the assistance in the design of the policies, pointing the costs associated with the development and showing appropriate technologies (Stern et al., 2019). Stern et al. (2019) points that for the policy instruments implementation, the formulation of agreements and adequate coordination contribute to the management of shared resources and the incorporation of the socio-ecological systems, as well as the engagement of the involved public (e.g. politicians, planners, society) and the minimization of the lobbies interest in the process. Front of the systemic risks associated with the Anthropocene, the governance needs to adopt new approaches and tools during the decision process and promote a sustainable future (Keys et al., 2019). In this sense, the institutions and public organisms related to the development process and natural resources management can formalize solid arrangements (e.g. pacts, normative dispositive creation, public policies implementation) and establish responsibilities in the different administrative levels (from national to local) to contemplate the conceptual infrastructure, the researches can bring the necessary information to attend the application of the indicator and guarantee the monitoring of the process and the implementation of the proposed steps.

The SEA involves a dialogue based on a constructive and collaborative perspective and takes as a base the scientific knowledge, so it is necessary the democratic participation, which generates an effective discussion and demands the public participation, the affected communities engagement and consultation reduce conflicts and improve a transparent decision making the front of

the representativeness possibility and litigation reduction (Devlin and Yap, 2008, Lobos and Partidario, 2014, Rega and Baldizzone, 2015). According to Glucker et al. (2013), public consultation is key for an effective process of evaluation. The public participation during all the proposed steps generate benefits and contribute to avoiding hindrances, creating a favorable condition to the process conduction and implementation.

Conclusions

Here we have presented a structure for wetlands management in the strategic decision and development process, in attendance to The Conservation on Biological Diversity and Ramsar Convention goals, taking as base the environmental policy instrument SEA. This framework provided a conceptual structure for wetlands ecosystem management, considering the SEA as an opportunity to avoid the negatives impacts from the strategic decision and development process. All the five key steps introduced can be applied in many situations and modifications can occur to attend the specific demands. The conceptual structure has great potential regarding wetlands protection and safeguards their ecosystem services, contributing in this way for the attendance of Conservation on Biological Diversity and Ramsar Convention strategic goals at the local level. Furthermore, the conceptual structure can assist the decision-making process and contribute to the public policy application, according to the ecological characteristics of wetlands ecosystems. Although, the administrative levels must take as a premise the need to promote wetlands conservation and provide resources for the application of proposed approaches related to Strategic Environmental Assessment. The academic participation and formal agreements in the different administrative levels contribute to optimizing the success of the proposed structure implementation.

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