

An evaluation of environmental plans quality: addressing the rational and communicative perspectives

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Abstract

Environmental action plans are important instruments intended to provide sustainable solutions for the most pressing environmental issues. As they should be updated regularly, efforts to evaluate their quality are essential for enabling incremental improvements in upcoming versions. The aim of our study was to systematically evaluate the quality of Romania's Local Environmental Action Plans (LEAPs) by following a theoretical framework that includes principles from both rational and communicative approaches to assessing plan quality. We selected 32 LEAPs and applied an evaluation protocol that enabled a comprehensive assessment of the plans. Our results showed an overall moderate quality of the LEAPs. Although most plans identify many environmental problems in need of solutions, in reality additional urgent environmental problems often exist. Furthermore, LEAPs perform only moderately in identifying

tools for implementation provisions and ensuring the participation of the public in the planning process, and they are even weaker in establishing goals and achieving coordination across different governmental levels. Overall the assessment reveals that plans are rarely able to craft an appealing policy message. Our findings could be used as guidance for LEAP coordinating agencies to improve the plans in the upcoming updating processes, as they identify plan weaknesses and suggest ways to achieve high quality environmental plans. Furthermore, our novel plan assessment method based on rational comprehensive and communicative approaches to plan quality evaluation can be adapted easily to other studies.

1. Introduction

The aim of environmental planning is to achieve sustainability goals by initiating ecological activities to solve critical environmental issues in a way that supports economic development and encourages social empowerment (Davoudi et al., 2019; Zeiger et al., 2019). It has been supported by the international agenda, such as the United Nations conferences on human environment in Stockholm in 1972, on sustainable development in Rio de Janeiro in 2012 or climate change in Paris in 2015 (Bäckstrand and Lövbrand, 2019; Danilov-Danil'yan and Reyf, 2018). Furthermore, dealing with the global challenges brought on by the degradation of the environment through human impacts (i.e., climate change, biodiversity loss) has made many governments worldwide to set commitments to address such challenges. Although improvements have been done (IPPC, 2018), the overall progress is slow due to economic, social, ecological and political factors (Victor et al., 2017). Over the past 46 years, a series of Environmental Action Plans has been supported by the European Environmental Action Programmes (Bourguignon, 2018). Such plans have become important instruments to protect and improve environmental quality by setting environmental priorities while including public participation as an essential part of the process. Furthermore, these plans aim to outline efficient and cost-effective solutions to deal with environmental degradation. However, evaluating the quality and implementation of such plans has been difficult due to their comprehensiveness and the amount of time between their making and outcomes occurrence (Ericksen et al., 2017).

Despite the increasing attention to environmental planning in recent years, little is known about the quality of plans dealing with environmental issues overall (Berke and Godschalk, 2009). Recent studies have focused on the evaluation of planning documents from specific policy domains such as: climate change (Woodruff and Regan, 2019), natural hazards (Horney et al.,

2017), housing (Ramsey-Musolf, 2018), ecosystem services (Cortinovis and Geneletti, 2018), green infrastructure (Kim et al., 2018), natural resource management (Potts, 2017), sustainable development (Conroy and Jun, 2016) and forest resources (Fostera et al., 2019).

Evaluation has become an important stage in any planning process, as it provides decision makers with information on whether a plan (i) is achieving its stated goals and policies, (ii) is offering appropriate guidance for its successful implementation and (iii) effectively communicates its intentions (Lyles and Stevens, 2014). Indeed, plan quality evaluation is valuable because it is a “learning process” (Berke and Godschalk, 2009) that aims to bring incremental improvements for upcoming plans. It is difficult to define a “good” plan because plan quality evaluation is subjective, and definitions of success and failure are relative based on the criteria the plans are judged upon. However, some authors suggest that a high quality plan provides “a clear and convincing picture of the future” (Berke and Godschalk, 2009, p. 229), and is persuasive, inspirational, and presents an attractive format easy to read and use (Bunnell and Jepson, 2011). On the other hand, a low quality plan follows a rigid and predetermined structure, is less creative and fails to deliver its promises (Bunnell and Jepson, 2011). The aim of our study was to develop and apply a method to systematically test the quality of Romania’s Local Environmental Action Plans (LEAPs). Many plan evaluation studies have been conducted in the U.S. (i.e. Berke et al., 2019; Kim et al., 2018; Spurlock, 2018) and Europe (i.e., Grădinaru and Hersperger, 2018; Mueller and Hersperger, 2015), i.e., in established democracies. Given Romania’s nascent democracy and environmental policy shaped by European Union (EU) organizations and conventions, it is a promising study case that can contribute to the international literature.

In line with discussions in planning theory on the purpose and workings of planning, we can distinguish between different approaches to plan evaluation. In their plan evaluation some authors focus on a rational approach, where plans are seen as blueprints and a logical sequence of principles defining plan quality is assumed. Thus, plans are assessed in terms of the goals they imply and how these are translated into policies whose implementation and monitoring are described to ensure that the problems are addressed (Guyadeen, 2017; Laurian et al., 2010). The rational approach has many flaws, and therefore many studies underlined the importance of assessing the communicative and persuasive power of the plans to supplement the rational model (Bunnell and Jepson, 2011). With this communicative approach, plans are seen as a guide for effective decision making and consensus building and are evaluated in terms of their usefulness (Laurian et al., 2010) and strength (Connell and Daoust-Filiatrault, 2017).

Most existing studies have focused largely on the rational comprehensive dimension and less on the communicative characteristics of the plans (Lyles and Stevens, 2014). A combination of both approaches in plan evaluation would result in a greater understanding of plans' strengths and weaknesses, which may further lead to better and more credible plans (Bunnell and Jepson, 2011; Norton, 2008). Some authors have suggested that the type of evaluation should depend on the purpose of the plan under evaluation and have referred to plans as, for example: visions, blueprints or responses to state planning mandates (Baer, 1997; Hopkins, 2001). However, to date, studies dealing with principles from both rational and communicative approaches in assessing the quality of comprehensive environmental plans are missing. The main goal of our evaluation is to close this gap. We use a framework recently proposed by Connell and Daoust-Filiatrault, 2017 but so far, to our knowledge, not operationalized and tested. The novel aspect of our research is thus to operationalize the framework by including in our evaluation core planning

principles (i.e., goals, fact bases, policies), but also additional principles contributing to plan quality (i.e., public participation, implementation, monitoring, policy focus, organization and presentation) which are under-represented in plan quality research (Guyadeen, 2019) and by testing it with Romanian Environmental Action Plans. Furthermore, our study contributes to planning literature by developing a protocol that can be applied not only to evaluate environmental action plans whose quality has not been examined in other studies but also other plans in different policy domains due to the reliability procedures we employed.

Research protocols and content analysis are the preferred methods to evaluate plan quality. We derived a protocol from the emerging plan quality literature to systematically evaluate the quality of Local Environmental Action plans (LEAPs) in Romania. We hypothesized that the quality of LEAPs is rather similar because they were adopted mostly in the same period and follow the guidance of a handbook for developing LEAPs (Ministry of Environment, 2004).

1.1. Framework for evaluation

The framework of Connell and Daoust-Filiatrault (2017) (Figure 1) represents the theoretical basis for our protocol. It is appropriate for our study because it reflects both the rational and communicative approaches to plan quality evaluation.

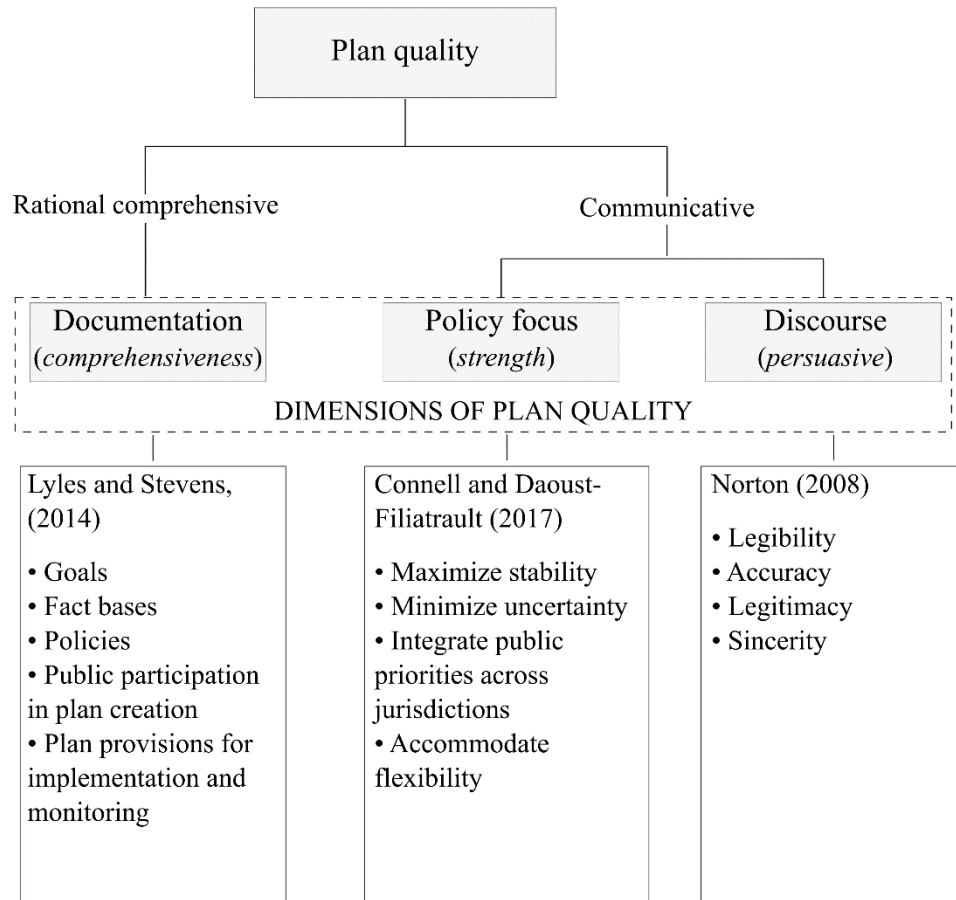


Figure 1: The framework for plan quality evaluation. *Source:* Connell and Daoust-Filiatrault (2017)

The *documentation* dimension relates to the plan format and incorporates the core principles according to key studies on plan quality (Table 1). Furthermore, it is important to assess this dimension because research is needed on the range of “goals, policies, types of ecological science-based information and implementation and monitoring actions incorporated into plans” (Berke et al., 2013). The *policy focus* dimension is important in order to assess a plan’s effectiveness as a communicative tool (Norton et al., 2018). It emphasizes the strength of the actions proposed to manage the environmental problems the core focus of the LEAPs. It is more subjective because it relies on researchers’ personal judgements when scoring the

corresponding items. Furthermore, it provides useful information on the consistency between the plan and other policies of hierarchical parties (Table 1). The *discourse* dimension evaluates a plan's persuasive impact. A high value in the *documentation* dimension is necessary for a high value in the *discourse* dimension because most of the items in the *discourse* dimension relate back to the items in the *documentation* dimension and even the *policy focus* dimension (Table 1). The aim of the discourse dimension is to reveal the quality of the plan as a communicative tool overall. Combining these dimensions facilitates a complete assessment of the quality of LEAPs.

Table 1: Dimensions and principles used to assess the LEAPs

Dimension/Principle	Definition of the principle	Source of the items
<i>Documentation</i>		
Goals (direction-setting principle)	Goals are statements of future desired aspirations and needs, as well as problem alleviations that reflect shared public concerns.	(Lyles et al., 2014a; Rudolf and Grădinaru, 2017)
Fact Bases (direction-setting principle)	Fact bases provide descriptive and empirical analyses of the actual and future local environmental conditions and impacts (in the absence of planning), which are further important for the prioritization of policies.	(Berke and Godschalk, 2009; Berke et al., 1999; Rudolf and Grădinaru, 2017; Stevens, 2013)
Policies (direction-setting principle)	Policies are actions aimed at ensuring that each goal is achieved and each environmental problem is alleviated.	(Ministry of Environment, 2004; Stevens, 2013)
Public participation in plan creation (action-oriented principle)	A description of the public participation process in the plan-making process, including identification of the stakeholders involved, the impact of their input in the plan's evolution, and the engagement techniques that were used.	(Rudolf and Grădinaru, 2017; Steelman and Hess, 2009; Stevens, 2013)
Plan provisions for implementation and monitoring (action-oriented principle)	The extent to which organization responsibilities, timeframes, funds and indicators are assigned for the policies implementation and monitoring to ensure the achievement of the stated goals.	(Berke et al., 1999; Rudolf and Grădinaru, 2017; Steelman and Hess, 2009; Stevens, 2013)
<i>Policy focus</i>		
Maximize stability	A stable LEAP in terms of policy focus is one that is based on clear and concise language (including clear rules and regulations) in the formulation of actions that can hold up to various challenges and leave little room for misinterpretation and ambiguity.	(Berke and Godschalk, 2009; Bunnell and Jepson, 2011; Connell and Daoust-Filiatrault, 2017; Norton, 2008; Rudolf and Grădinaru, 2017)
Minimize uncertainty	A minimally uncertain LEAP in terms of policy focus has a good internal coherence (where goals, policies and implementation are mutually reinforcing), clearly	

	defining responsibilities for action implementation and monitoring.	
Integrate public priorities across jurisdictions	This principle aims to ensure consistency of the LEAP with other plans and policies at different governmental levels.	
Accommodate flexibility	A flexible LEAP avoids presenting a highly rigid framework by including possible exceptions to general rules in the formulation of actions and governance mechanisms.	
<i>Discourse</i>		
Legibility	A legible LEAP includes clear and complete information on the plan's internal (specifically regarding goals, policies and associated implementation responsibilities) and external quality (specifically regarding the way it is organized).	
Accuracy	An accurate LEAP is solid in terms of the fact bases analyses.	(Norton, 2008)
Legitimacy	The legitimacy of a LEAP is enhanced when the plan is legible and public participation is used.	
Sincerity	A sincere LEAP minimizes uncertainty, builds cohesion across jurisdictions and communicates the implementation plan and outcomes.	

1.2. Environmental policy in Romania

Romanian environmental policy development has been intertwined with the process of Romania's integration into the European Union (EU) in 2007. Environmental protection began in 1973 with the first Law on Environmental Protection, whereas today the environmental protection legislation is strongly determined by the EU legislation (Petrescu-Mag, 2008). In Romania, the foremost governmental institutions on environmental matters are the Ministry of the Environment, which coordinates the National Environmental Protection Agency (NEPA), and Romania's National Environmental Guard. All of Romania's 42 counties have an Environmental Protection Agency (EPA) to whom the NEPA delegates the responsibility of implementing environmental policies. The principal instruments for environmental policy are Environmental Action Plans (EAPs). Such plans identify the most pressing environmental problems, establish objectives, targets, timetables, and actions required to achieve the

management of the environmental problems, and describe tools for their implementation and monitoring. During the pre-accession to the EU, Romanian governmental bodies began to draft EAPs on the national, regional and local (county) levels. Today, there is one national EAP and 42 local EAPs (LEAPs).

Our study focuses on the evaluation of the Romanian LEAPs. The guidance material for developing the plans is provided in a handbook (Ministry of Environment, 2004) that is based on a guide prepared by Markowitz (2002) and the methodology established within a project (PHARE Project RO 9804.04.01.001, 2001). LEAPs are not binding but are intended to provide guidance to help mitigate the most urgent environmental problems. They are required to include participatory approaches to ensure the effective implementation of the environmental protection actions. Their drafting involves a range of experts, from public agencies to private companies and NGOs, and their approval, implementation and monitoring are the responsibility of different institutions (Figure 2). Regular updating (every three or five years) and monitoring are required for the LEAPs (Ministry of Environment, 2004). LEAP monitoring is a voluntary and non-binding process that aims to provide information about the implementation status of the actions based on the reports of the institutions that took responsibility for action implementation. Often, a wide range of actions are not implemented in a timely and effective manner (Vasile and Holt, 2014).

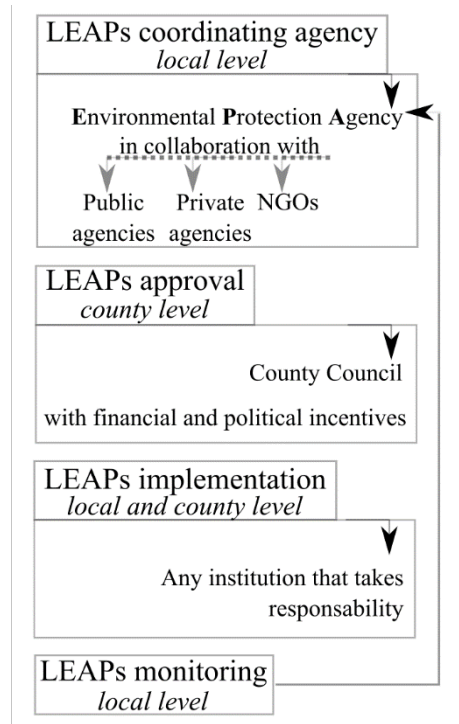


Figure 2: Local Environmental Action Plans (LEAPs) cycle and responsible institutions
(authors' own compilation)

2. Material and Methods

2.1. Study area

The target sample consists of Romanian counties that have a LEAP (Figure 3). Bucharest (Romania's capital city) was excluded from the potential sample of 42 because it is a city state and differs from the other counties in several dimensions such as population size, urbanization and environmental conditions. In order to ensure that all the items of the protocol could be assessed, the sample was further limited to those counties with a complete LEAP containing all the main sections: (i) initiation, organization and institutionalization of the planning process; (ii) county's current and projected environmental quality; (iii) identification and prioritization of county's environmental problems; (iv) local action plan to deal with the identified environmental

problems; (v) implementation of the action plan; (vi) monitoring of the action plan; and (vii) evaluation of the outcomes and plan update (Ministry of Environment, 2004). Furthermore, we could not obtain the LEAPs from two counties, owing to administrative burdens.

The protocol was pretested on four LEAPs that were not included in the final sample. Thus, out of 42 counties total, the final sample included 32 counties along with their LEAPs, covering 193,758 km² (81.28% of Romania's total area), with 13,682,092 inhabitants (61.52% of Romania's total population) (NIS, 2017). The sample thus included counties from all eight of Romania's development regions, from sparsely to densely populated counties (range = 29.2 – 150.8 inhabitants/km²), as previous studies have shown that population size has a positive influence on plan quality (Berke et al., 1999; Stevens, 2013; Tang and Brody, 2009) and counties with a large population may produce higher quality plans.

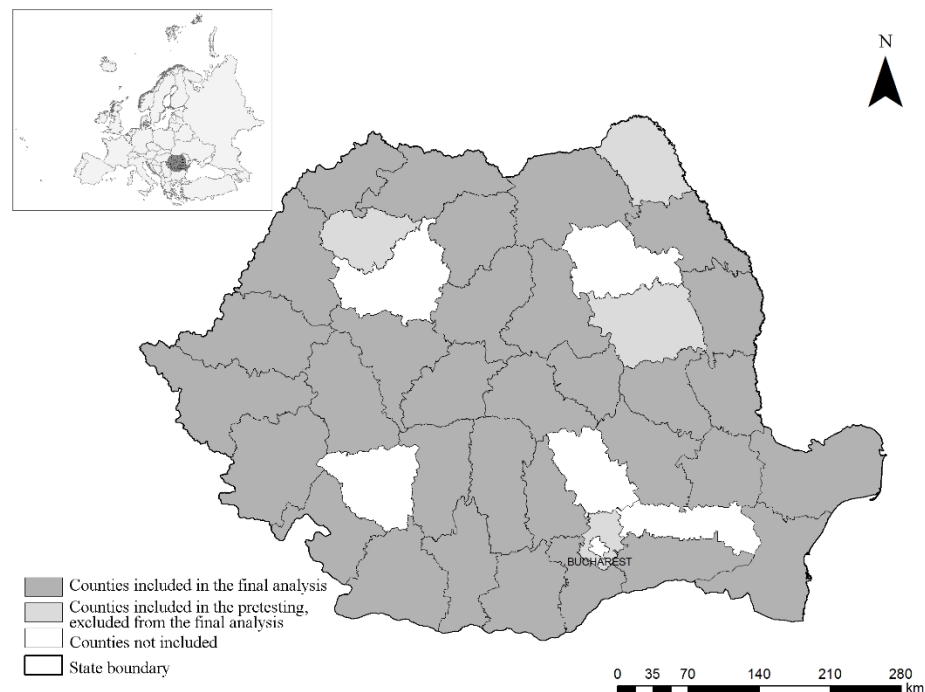


Figure 3: Distribution of the sampled counties. The location of Romania within Europe is given in the inset. *Source:* geo-spatial.org; *Map:* Mitincu, (2019)

2.2. Data collection

The LEAPs were collected (i) from the websites of each county's EPA and (ii) if necessary, by e-mail request. All plans are the current approved versions, with the most recent changes implemented (Table 2).

Table 2: Counties and LEAP characteristics

County (final analysis) <i>County</i> (pretesting)	Population (NIS, 2017)	Year of plan's initial adoption	Analyzed version	Current status at the time of analysis
Alba	330973	2004	2006 (first revision)	second revision initiated in 2013, not finished
Arad	422029	2005	2009 (first revision)	second revision scheduled for 2013
Argeș	590561	2004	2009 (second revision)	third revision scheduled for 2013
Bacău	595654	2005	2014 (first revision)	no other initiated
Bihor	566435	2004	2016 (second revision)	no other initiated
Bistrița-Năsăud	281432	2004	2015 (second revision)	no other initiated
Botoșani	390404	2006	2013 (second revision)	third revision scheduled for 2017
Brașov	550747	2005	2011 (second revision)	third revision initiated in 2015, not finished
Brăila	299125	2006	2010 (first revision)	second revision initiated in 2013, not finished
Buzău	425856	2005	2013 (first revision)	no other initiated
Caraș-Severin	279119	2004	2007 (first revision)	second revision initiated in 2014, not finished
Călărași	292843	2004	2006 (first revision)	no other initiated
Constanța	678406	2005	2005 (first revision)	last revision initiated in 2012, not finished
Covasna	204958	2004	2011 (second revision)	no other initiated
Dâmbovița	501302	2004	2013 (second revision)	third revision scheduled for 2017
Dolj	635589	2004	2016 (third revision)	no other initiated
Galați	514429	2006	2010 (second revision)	third revision initiated in 2016, not finished
Giurgiu	274050	2003	2016 (fourth revision)	no other initiated
Harghita	305709	2003	2013 (second revision)	no other initiated
Hunedoara	393154	2002	2012 (second revision)	no other initiated
Iași	789977	2004	2014 (second revision)	no other initiated
Iłfov	460517	2005	2012 (second revision)	no other initiated
Maramureș	465487	2001	2013 (third revision)	no other initiated
Mehedinți	249459	2011	2015 (third revision)	no other initiated
Mureș	540790	2004	2007 (first revision)	second revision finished in 2017
Olt	407741	2004	2016 (second revision)	no other initiated
Satu-Mare	336562	2004	2014 (second revision)	no other initiated

Sălaj	215910	2004	2007 (first revision)	no other initiated
Sibiu	399758	2004	2014 (second revision)	no other initiated
Suceava	627934	2005	2014 (second revision)	no other initiated
Teleorman	349688	2004	2014 (second revision)	no other initiated
Timiș	698201	2008	2008 (first revision)	second revision initiated in 2011, not finished
Tulcea	200716	2005	2011 (second revision)	no other initiated
Vaslui	384144	2005	2012 (second revision)	no other initiated
Vâlcea	356716	2016	2016 (third revision)	no other initiated
Vrancea	328202	2006	2012 (second revision)	no other initiated

2.3. Coding protocol and content analysis of Local Environmental Action Plans (LEAPs)

An evaluation protocol consisting of 89 items, grouped into 13 categories and 3 dimensions, was used to systematically evaluate the quality of LEAPs (Appendix 1). The protocol covers the entire plan content. Most items are used to assess the first dimension, *documentation*, because of the many environmental fields and many provisions for implementation and monitoring. Fewer items are used when assessing the *policy focus* and *discourse* characteristics because they represent a summary evaluation of the LEAPs or of the items from the *documentation* dimension.

Most available research protocols include core principles of plan quality that can be applied to plans from a wide range of domains and scales (Berke and Godschalk, 2009). It is important that a protocol builds upon the existing ones in order to contribute to the body of knowledge on plan quality (Stevens et al., 2014). Therefore, the items of the protocol were developed on the basis of previous studies in the literature of plan quality (Table 1) and a handbook for developing LEAPs (Ministry of Environment, 2004) when dividing the *policies* principle into four representative categories: (i) management of natural resources; (ii)

environmental nuisances; (iii) institutional and administrative capacity; and (iv) environmental education awareness, public health and recreation.

The scoring method that we applied to evaluate the LEAPs followed a binary and three-level ordinal scale (Berke and Godschalk, 2009). For the binary scale, 0 means the item in question is *not included*, while 1 means the item is *included* in the LEAP. For the ordinal scale, 0 means the item in question is *not present*; 1 means there is a *general description* of the item in question or a partial illustration of the item; and 2 means that there is a *detailed description* of the item in question or a more complete illustration of the item, measured as: (i) “none”, “some” and “most”; (ii) “never”, “seldom” and “often”; and (iii) “poor”, “middle” and “high”.

The protocol was imported into a content analysis software program (*MAXQDA 18.1.0*, VERBI Software GmbH, Berlin, Germany) to improve efficiency and reliability in coding procedures. To produce reliable and replicable data, specific conditions have to be met and standard content analysis procedures have to be employed (i.e., use multiple coders who work independently; employ an adequate intercoder reliability measure; report reliability scores for each quality item of the plan) (Berke and Godschalk, 2009; Krippendorff, 2013; Lyles et al., 2014b; Lyles and Stevens, 2014).

The content analysis of the LEAPs followed standard coding procedures (Krippendorff, 2013). A training process was carried out where instructions on the protocol items were presented to the two coders so that the items could be consistently evaluated. Two coders applied the protocol in a pretesting process on four LEAPs. After the pretesting process and the subsequent analysis of the four plans, the protocol was refined. The two coders content analyzed all plans independently of each other. When disagreements in scores between the two coders were identified (see below), the coders reassessed the plan documents and engaged in discussion

to arrive at a consensus on which coder’s score should be assigned to each item for which there was disagreement.

A standardized index score was computed for each protocol category, in line with previous plan quality studies (Berke and Godschalk, 2009; Lyles et al., 2014a). First, the ordinal items were divided by 2.0 to place them on a 0.0–1.0 scale. According to Lyles et al., (2014), this procedure ensures equal weighting of binary and ordinal items. Second, the scores for all items within an individual category were summed. Third, the summed scores were divided by the total number of items per category. Last, the generated score was multiplied by 10 to place each category on a scale of 0.0 – 10.0. We considered plans/principles/dimensions with a score of 0.0 – 4.0 as having a low quality, 4.0 – 7.0 as having a moderate quality, 7.0 – 9.0 as having a high quality and 9.0 – 10.0 as having a very high quality.

Coding reliability was determined by calculating Krippendorff’s alpha (Krippendorff, 2013) for the results of both the pretesting process and the final analysis. Such a measure of agreement between the coders is neglected in many planning evaluation studies (Stevens et al., 2014), but it is important for producing reliable and transparent plan quality data. For each item in the protocol, the alpha value was calculated using the “kripp.alpha” function in the *irr* package in the statistical software R (R Core Team, 2017) (Appendix 1). We followed the standards recommended by Stevens et al. (2014) to decide which items were reliable and should thus be included in the final analysis. Therefore, the 13 categories were classified depending on (i) the number of items each category included and (ii) the degree to which the items were distributed throughout the plans. Four categories of items emerged (Table 3).

Table 3: Standards for the interpretation of Krippendorff’s alpha (adapted from Stevens et al., 2014)

Plan quality categories	Upper standard	Lower standard
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1. Few items, highly discrete (Goals; Maximize Stability, Minimize uncertainty, Accommodate Flexibility; Accuracy, Legitimacy, Sincerity)	0.80	0.67
2. Many items, highly discrete (Fact bases; Policies; Plan provisions for implementation and monitoring)	0.70	0.58
3. Few items, highly distributed (Public participation in plan creation; Integrate public priorities across jurisdictions)	0.50	0.42
4. Many items, highly distributed (Legibility)	0.40	0.33

Items with alpha scores between the upper and lower standards were reassessed and reconciled. Items above the upper standards were only reconciled (Appendix 1). In the pretesting process there were three items with alpha scores below the lower standards and five items between the upper and lower standards. As the items with scores below the lower standards were considered important for the study, the differences between the two coders were reconciled based on a reassessment of the protocol.

In the final analysis, robust results were achieved, as 97% of the protocol items had alpha scores above the upper standards and only three items had alpha scores between the upper and lower standards.

Furthermore, there were some items that lacked variability in the codes, and the values of Krippendorff's alpha that emerged were misleadingly low. For such items, we calculated the percent agreement, as recommended by Stevens et al. (2014). In the final analysis the percent-agreement scores for these items ranged from 94% to 97%. Other authors suggest that a percent-agreement score of at least 80% is considered acceptable (Berke and Godschalk, 2009).

Mean plan quality scores and their standard deviations were calculated for all 13 categories of plan quality. There were cases where most of the plans had the same high score (i.e., 10) for a given category while a few had the same low score (i.e., 0). In such cases, the standard deviation was quite high (i.e., *Goals, Accuracy*) despite the low variation. We thus also

calculated the mode for each item and displayed the value with the highest frequency (Appendix 1).

3. Results

The overall mean score of all three dimensions was 6.53 (6.54 for *documentation*, 6.31 for *policy focus* and 6.73 for *discourse*), which indicates a moderate score out of a possible score of 10. The mean scores and standard deviations are presented in Figure 4 for the 13 categories of plan quality for the overall sample of 32 counties (for detailed values see Appendix 2). In the following sections we describe (i) the main plan quality findings for the dimensions and principles and (ii) a comparison of the scores for the individual plans.

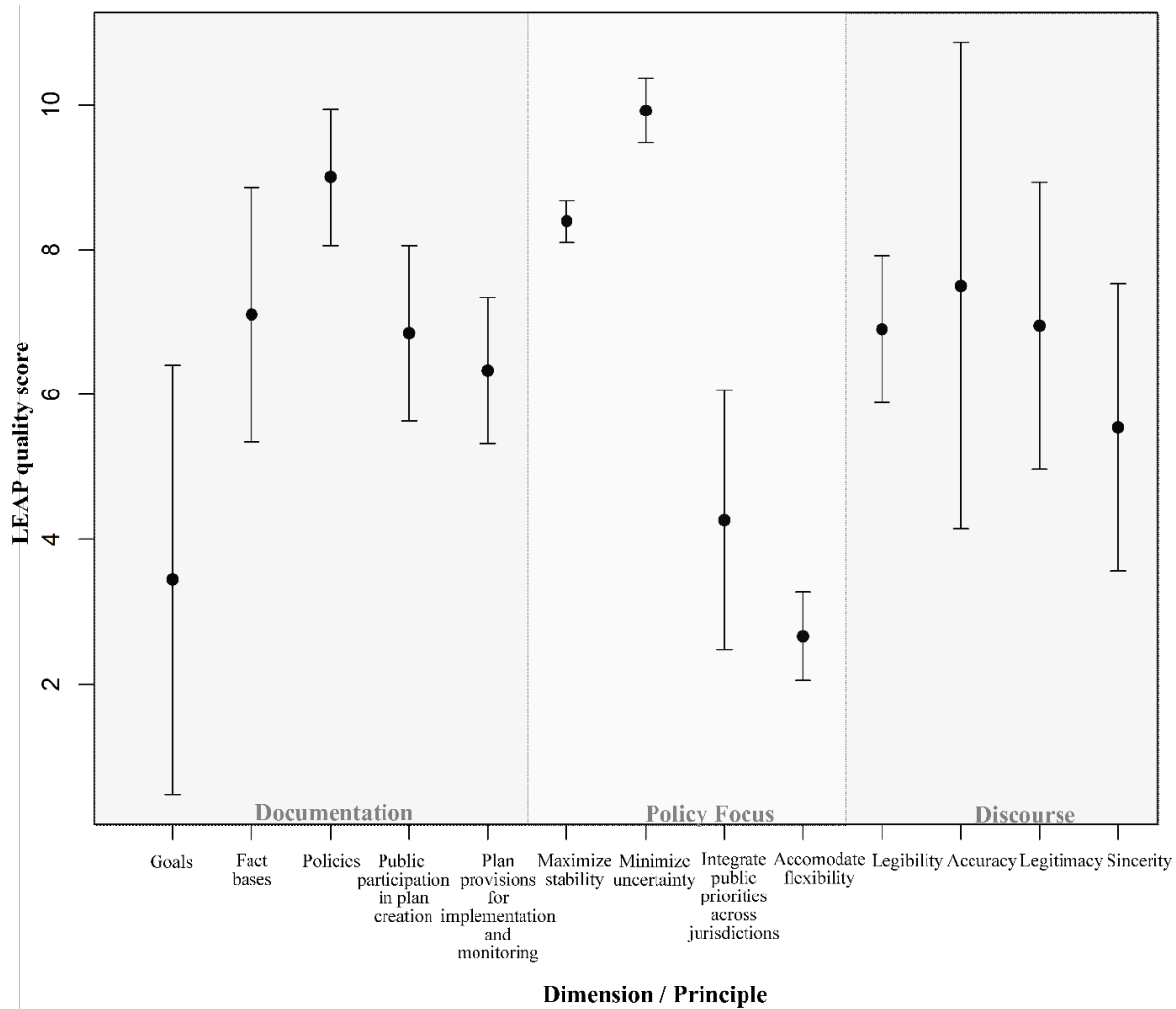


Figure 4: Mean and standard deviation of Local Environmental Action Plan quality scores

3.1. Quality of dimensions and principles

The analysis of the principles from the *documentation* dimension indicates high variability in the scores for the three direction-setting principles, ranging from 3.44 for *goals* to 7.10 for *fact bases* and 9.00 for *policies*, while the scores for the two action-oriented principles are quite similar, ranging from 6.33 for *implementation and monitoring provisions* to 6.85 for *public participation in plan creation*. Slightly over half of the plans (56%) include all principles defining plan quality.

Low scores for *goals* result from broadly formulated goals at the beginning of the plan document. Furthermore, the plans often only present goals that are required by the regulations. All plans have a rather strong fact base, resulting from (i) the quality of the illustrations used to depict the environmental quality indicators and (ii) the reliance on multiple data sources. Indeed, all LEAPs have tables (100%), 91% had diagrams, 69% had maps and 53% had other illustrations (i.e., pictures). The most common data sources were official statistics, specifically the Counties' Annual Environmental State Reports (in 94% of the plans) These reports contain detailed and locally specific analyses of environmental quality based on long-term monitoring.

The relatively strong *fact bases* is most likely the result of the plan-format requirements issued by the national government, which indicate that a section discussing the current local environmental conditions and pressures must be included. The high values for *policies* indicate that the LEAPs demonstrate a proactive stance in the mitigation of a wide range of environmental problems. The most prevalent policies are those related to the management and protection of air, water, soil and wildlife, while policies related to the management of consumptive activities (i.e., hunting, fishing and timber harvesting) and to the improvement of public health are least common.

The scores for both action-oriented principles are moderate. Most of the plans were written with the involvement of public officials, private companies and NGOs (in 78% of the LEAPs), while a solid engagement of citizens and mass-media was rare. The most common participation techniques used were stakeholders' meetings (in 50% of the LEAPs), surveys (44%), and expert opinion and participation incentives, i.e., posting information related to the LEAP on the Internet (each in 34% of the LEAPs), while public debates (9%) and consensus negotiations (16%) were least common.

Almost all the analyzed LEAPs include detailed provisions regarding assigning responsibilities to specific actors for implementing actions, establishing timelines and targets for actions, and finding funding sources for the implementation of actions (88% of LEAPs have scores higher than 7.5 for implementation provisions). However, some of them lack a detailed section on monitoring, i.e., the identification of responsible actors, timelines or methods for updating the plans. Indeed, only 9% of the LEAPs score higher than 7.5 for monitoring provisions.

Within the *policy focus* dimension, the principles' mean scores vary widely: 8.39 for maximize stability, 9.92 for minimize uncertainty, 4.27 for integrate public priorities across jurisdictions, and 2.66 for accommodate flexibility. LEAPs are highly stable and minimize uncertainty by using clear language in the formulation of actions, establishing enforceable mechanisms, and showing good consistency between actions. On the other hand, the plans are quite rigid and lack flexibility regarding overriding governance mechanisms such as citizen participation, working groups or possible exceptions to the general regulations in the formulation of actions.

The principles from the *discourse* dimension reveal moderate and high scores: 6.90 for legibility, 7.50 for accuracy, 6.95 for legitimacy and 5.55 for sincerity.

The almost high score for legibility can be attributed to the fact that LEAPs follow a predetermined structure, as outlined in the handbook for developing LEAPs (Ministry of Environment, 2004), and therefore are highly standardized, and also to the high scores for policies and moderate scores for implementation and monitoring provisions. The high score for accuracy is rooted in the plans' strong descriptive and analytical fact bases. Regarding legitimacy, the LEAPs score relatively high for legibility but lower in public participation. The

moderate score for sincerity is due to the moderate scores in implementation and monitoring provisions, the high scores in minimizing uncertainty, and the low scores in integrating public priorities across jurisdictions and in providing a section that communicates how many actions have been implemented.

3.2. Comparison of individual plans

Overall, the LEAP of the County of Giurgiu has the highest score (7.68), whereas the County of Mureş has the lowest score (5.15). Less than half of the counties (31%) have scores over 7.0, indicating a high quality of their LEAPs, while the remaining counties (69%) have scores between 5.0 and 7.0, indicating moderate quality of their plans.

In terms of the *documentation* dimension, Satu Mare's LEAP has the highest score (7.97, indicating high quality of the plan), while Hunedoara's LEAP has the lowest score (4.94, indicating moderate quality of the plan) (Appendix 2). The difference between these two counties is caused by differences in the quality of goals, fact bases and policies. For example, Satu Mare's LEAP offers clear *goals* in the beginning of the document, supporting the definition of problems, needs and aspirations in terms of environmental quality that have to be alleviated or understood, and strong *fact bases*, providing clear visual information and data sources that enhance the selection of priority environmental problems. In contrast, Hunedoara's LEAP fails to identify any clear goals and provides limited fact bases in terms of visual information and data sources.

Regarding the *policy focus* dimension, Giurgiu's LEAP has the highest score (7.29, indicating high quality of the plan), while Mureş's LEAP has the lowest score (5.21, indicating moderate quality of the plan). The difference between them is the result of a discrepancy in the degree of coordination between the plans and other planning documents of hierarchical parties.

For example, Giurgiu's LEAP entails vertical, horizontal and intercommunal coordination with other planning documents of federal, regional and local parties, such as coordination with the policies and strategies of the Ministry of the Environment, the Agency for Regional Development and local EPAs, to successfully implement the proposed environmental actions. In contrast, Mureş's LEAP does not specify how the plan coordinates with hierarchical parties. Giurgiu's LEAP represents the fourth revision of the plan, while Mureş's LEAP is the first revision.

In terms of the *discourse* dimension, Sibiu's LEAP has the highest score (8.61, indicating high quality of the plan) while Buzau's LEAP has the lowest score (3.55, indicating low quality of the plan). For example, Sibiu's LEAP is well organized in terms of content and structure, it addresses coordination with other plans and policies at different levels, and it communicates the results of the monitoring activities. In contrast, Buzau's LEAP fails to achieve in all these aspects and provides a very low quality section on fact bases, with poorly written text and no visual information regarding the environmental problems characterizing the county.

4. Discussion

The overall mean scores indicate a moderate quality of the LEAPs and stresses the need for plan improvement. However, previous research has also found a moderate quality of local hazard mitigation plans (Berke et al., 2012; Lyles et al., 2014b), local comprehensive plans (Kim et al., 2018), environmental impact reports (Tang et al., 2008) and national adaptation plans (Woodruff and Regan, 2019). The systematic evaluation of the 32 LEAPs with the detailed protocol revealed the plans' specific strengths and weaknesses and can serve as a starting point for discussing necessary improvements.

One might assume that plan quality is higher in plans that have undergone several updates, as they are more likely to include incremental improvements. Although some studies have demonstrated that outdated plans can have low plan quality scores (Kim et al., 2018; Tang and Brody, 2009), we did not find a relationship between the plan quality overall and reviews (comparing first edition plans and plans that had been revised ($t\text{-test} = 1.959, p > 0.05$). Our results correspond to those reported by Potts (2017) regarding natural resource management plans in two states in Australia.

4.1. Quality of documentation

Since the *documentation* of policies principle has the highest middle score out of all principles, we can expect that LEAPs bring into focus the most pressing environmental problems. Indeed, clear *goals* are important for the effective formulation and implementation of actions and policies (Tang, 2008), while accurate *fact bases* offer a basis for strong *policies* (Berke et al., 2013). However, urgent problems, such as those related to climate change and deforestation, are not among the prominent ones even though significant related events have affected many counties across the country (Petrișor, 2015; Purica, 2015). This suggests a poor representation of the real problems by the LEAPs, possibly because the plans mostly rely on official statistics when they establish the environmental problems that require attention. However, it has been shown that the data sources used for producing statistics regarding green spaces in Romania do not produce correct and reliable results (Badiu et al., 2016). Furthermore, LEAPs are developed through collaborative efforts without any financial aid from the government, which could explain why the plans rely on the existing official statistics and miss the real environmental problems. High-quality plans must be well grounded in local

environmental problems because an environmental problem that is not described in a LEAP will not be politically acceptable and economically feasible to address.

The moderate scores for *public participation* and *implementation and monitoring* raise concerns about the potential for successful implementation of LEAPs. LEAPs are written based on the input of multi-agency committees. Although other studies have found a higher participation value when such multi-agency committees are involved (i.e., Woodruff and Regan, 2019), our study shows the opposite pattern. This might be because the young democracy in Romania means that its national planning system suffers from limited experience with participatory processes (Puscasu, 2009). Even though procedural pathways are presented to citizens, their engagement in the LEAP-making process is very low. People have low trust in institutions and public authorities because they perceive that they have no power to influence the decision-making process (Baba et al., 2009). Furthermore, consensus is very rarely mentioned as a participation technique used in the LEAPs, even though it is considered among the best methods available for public participation (Susskind and Cruikshank, 2006). This is because collaborative processes are poorly run in Romania and usually fail to produce longer-term outcomes (Hossu et al., 2018, 2017). Other studies have likewise found a moderate quality of participation processes when evaluating the quality of local mitigation plans (Lyles et al., 2012). Moderate *implementation and monitoring* scores indicate a modest ability of plans to effectively deal with the environmental problems through the proposed actions, and they suggest poor efforts in checking whether the process is meeting the predetermined benchmarks. This can result from sharing responsibility for LEAP implementation and monitoring across too many parties (Figure 1), which may delay the implementation and monitoring of proposed actions. Furthermore, LEAPs usually lack information about the costs of implementation. Most LEAPs

specify that such costs are difficult to estimate. However, these details are important for subsequent steps (Hossu et al., 2018).

4.2. Policy strength

The poor coordination of the LEAPs with other planning documents of hierarchical parties (for the moderate quality plans) can be explained by the fact that numerous aspects of environmental policy are also coordinated by other ministries, and in Romania the level of coordination between institutions on environmental matters is low (Hossu et al., 2018; Nita et al., 2016). Furthermore, Horney et al. (2017, 2012) explained that coordination across different levels may be hampered when plans refer to urban areas where several actors should work in coordination and a history of collaboration barely exists.

The high scores for stability and minimizing uncertainty characterize the proposed LEAP actions as highly knowledgeable of the environmental problems they intend to address. Stable and certain actions represent a strong base that can be used to achieve effective environmental protection, as they leave little room for misinterpretation. However, being too stable or too strict may bring failure regarding effectiveness in certain circumstances. For instance, flexible responses for sustainable land use planning are crucial to adapt to local circumstances and temporal dynamics (Artmann, 2014; Oskam and Feng, 2008). Furthermore, in the LEAPs each action is accompanied by a definition of the problem that requires action, general and specific goals, indicators and targets, thereby reducing possible misinterpretation or confusion regarding the actions.

The low scores for the flexibility principle indicate the difficulty of the actions in being adaptable to special circumstances. Governance mechanisms and possible exceptions to the environmental and planning regulations, as measures of flexibility (Connell and Daoust-

Filiatrault, 2017), are poorly addressed in the formulation of LEAP actions. This can make the implementation of actions harder, as confirmed by reports from the environmental protection agencies on the status of LEAP action implementation (NEPA, 2016). Furthermore, in Romania local participatory governance in environmental matters rarely takes place, in order to ensure efficient conservation activities (Manolache et al., 2018). As any plan is bound to be imperfect, it is important to recognize the future value of engaging stakeholders. This will make future planning more likely to succeed as stakeholders learn how to perfect the process.

4.3. Discursive potential and recommendations to improve the quality of Romanian LEAPs

The evaluation of the LEAPs as a communicative tool using the principles from the *discourse* dimension reveals specific aspects that need to be improved to enhance LEAP quality. Specifically, there is a need to improve: (i) LEAP *legitimacy* by improving public involvement in the planning process, creating opportunities for feedback and integrating the feedback back into the plans. Furthermore, LEAP coordinating agencies should involve research experts in LEAP development in order to benefit from their expertise and identify the most relevant and urgent environmental issues to be solved; (ii) LEAP *legibility* by defining clear goals in the beginning of the document to serve as solid benchmarks for action formulation, and by providing clear implementation and monitoring guidance to ensure that the proposed actions have the desired effects (Tang, 2008); and (iii) LEAP *sincerity* by improving inter-level consistency and communication of action progress to advance toward a successful implementation of plans (Stevens, 2013).

LEAP coordinating agencies may take advantage of the protocol and results described in this study. Doing so will help them understand the main weaknesses of the plans and react accordingly by developing high quality LEAPs in the next updated versions.

4.4. Conclusions

The aim of our study was to systematically evaluate the quality of Romania's Local Environmental Action Plans (LEAPs) by operationalizing and testing a theoretical framework (i.e., Connell and Daoust-Filiatrault 2017). We properly achieved this aim by developing a comprehensive evaluation protocol consisting of 89 items that include principles from both rational and communicative approaches to assessing plan quality. By employing standard content analysis procedures, we produced reliable data (as indicated by the high reliability scores for most of the protocol items, Appendix 1) about the quality of local environmental action plans in Romania. Furthermore, the combination of the rational and communicative approaches proved to be helpful. Our evaluation and the associated protocol thus focused on how well the plans conform to specific characteristics (the rational approach), coordination and governance issues, as well as the strength of the plans in improving public and private decision making regarding environmental quality.

In many counties, the handbook for developing LEAPs (Ministry of Environment, 2004) played an important role during the writing up of the LEAP. The handbook provides, for example, lists of environmental problems the plans should/could address and actions that could be taken. In the protocol, the *policy focus* dimension can be directly linked to the handbook because the four categories and their associated items were selected based on the handbook. However, during plan assessment we encountered other relevant environmental issues, such as restoration of artistic works, preservation of historical and archaeological sites and improvement

of knowledge regarding environmental legislation, and the list had to be amended accordingly. Such issues are of particular importance, for example heritage and culture resources are in urgent need to be wisely and collaboratively managed and protected for the benefit of cities dwellers and future generations (Verdini et al., 2016).

Our protocol included many items, and it might be difficult for other researchers to address all of them when there are not enough resources or when the purpose of evaluation differs. Further research should address plan conformance, i.e., the implementation of policies as stated in the LEAPs (as a reflection of the rational approach), and plan performance, i.e., the use of the plan in decision making (as a reflection of the communicative approach). This could be done, for example, with personal interviews and case-study analysis. Such an analysis could also be used to reveal the factors that support and impede high plan quality. Future research on the consistency of LEAP policies with recent concepts, such as nature-based solutions or ecosystem services, could be helpful to develop effective environmental policies. In fact, concepts such as ecosystem services can support comprehensive environmental planning approaches in systematically developing goals, analyzing its status and assessing planning impacts on environmental qualities (Artmann et al., 2017).

The evaluation of LEAP quality in our study revealed the strengths and weaknesses that require careful consideration to ensure high quality plans. This provides an opportunity for environmental protection agencies (EPAs) to improve the LEAPs in the upcoming updating processes. We expect that the protocol developed in this study can be used by LEAP coordinating agencies worldwide so that future plans will reach the “desirable standard based on accepted plan quality standards”, as requested by Berke and Godschalk (2009). The findings of our study could be directly useful for other countries experiencing the Europeanization of

environmental planning as they have to meet similar requirements for environmental action plans. Other developing countries sharing similar environmental issues might benefit from the findings since the identified weaknesses can guide planners in other areas to issues that require special attention. Despite political, economic, social and cultural differences between Romania and other countries, the findings of this research may motivate planners to improve public participation in plan-making which has been a prominent issue in many developing countries worldwide (Fonseca et al., 2017; Khosravi et al., 2019; Lovrić et al., 2018), as well as coordination across different hierarchical and horizontal levels, a common flaw for both developing (Yoseph-Paulus and Hindmarsh, 2018) and developed countries (Huh et al., 2017). Such multi-lateral collaborations are in particular needed in the face of pressing societal challenges such as climate change (Bäckstrand and Lövbrand, 2019).

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Appendix 1

Table A1: Protocol to assess the Local Environmental Action Plans. Results of the final analysis

<i>Documentation</i>	Coding	Mode	Alpha ¹	Decision ²
1. Goals				
1.1. Does the plan include a clearly defined goal for improving the overall environmental quality of the county?	binary	10 (63%)	1	
1.2. Are the overall environmental goals clearly identified?	binary	10 (63%)	1	
1.3. Are the specific environmental goals clearly identified?	binary	0 (94%)	0.786	reassessed and reconciled
1.4. Are the specific environmental goals clearly linked to the county's specific environmental problems?	binary	0 (94%)	0.786	reassessed and reconciled
2. Fact bases				
2.1. Does the plan include a separate section that precisely describes the county's general environmental conditions (i.e., topography, climate, landscapes, natural resources)?	three-level ordinal	10 (69%)	0.848	reconciled
2.2. Does the plan include a description of the present state of the county's main environmental issues?	three-level ordinal	10 (100%)	1	
2.3. Does the plan include a description of the future state of the county's main environmental issues?	three-level ordinal	0 (50%)	0.85	reconciled
2.4. <i>Tables</i>				
2.4.1. Are facts presented in tables?	binary	10 (100%)	1	
2.4.2. Do the tables display information that is relevant and comprehensible?	three-level ordinal	10 (100%)	1	
2.4.3. Do the tables have a title listed?	three-level ordinal	10 (78%)	1	
2.4.4. Do the tables have a data source listed?	three-level ordinal	5 (69%)	0.932	reconciled
2.5. <i>Diagrams/Graphs</i>				
2.5.1. Are facts presented in diagrams/graphs?	binary	10 (91%)	1	
2.5.2. Do the diagrams/graphs display information that is relevant and comprehensible?	three-level ordinal	10 (91%)	0.844	reconciled
2.5.3. Do the diagrams/graphs have a title and a legend listed?	three-level ordinal	10 (91%)	1	
2.5.4. Do the diagrams/graphs have a data source listed?	three-level ordinal	5 (44%)	0.905	reconciled
2.6. <i>Maps</i>				
2.6.1. Are facts presented in maps?	binary	10 (66%)	1	
2.6.2. Do the maps display information that is relevant and comprehensible?	three-level ordinal	10 (59%)	0.941	reconciled

2.6.3. Do the maps have a title and a legend listed?	three-level ordinal	10 (53%)	1	
2.6.4. Do the maps have a data source listed?	three-level ordinal	0 (84%)	1	
2.7. Are fact presented in <i>other graphical formats</i> ?	binary	10 (53%)	1	
3. Policies				
3.1. <i>Management of natural resources</i>				
3.1.1. Does the plan include at least one action related to air quality management?	binary	10 (100%)	1	
3.1.2. Does the plan include at least one action related to water quality management?	binary	10 (100%)	1	
3.1.3. Does the plan include at least one action related to soil quality management?	binary	10 (100%)	1	
3.1.4. Does the plan include at least one action related to agricultural land management?	binary	10 (91%)	0.842	reconciled
3.1.5. Does the plan include at least one action related to wildlife management?	binary	10 (100%)	1	
3.1.6. Does the plan include at least one action related to forestry management?	binary	10 (84%)	0.873	reconciled
3.2. <i>Environmental nuisances</i>				
3.2.1. Does the plan include at least one action to mitigate the hazards' impacts?	binary	10 (97%)	0.97 ³	reconciled
3.2.2. Does the plan include at least one action to mitigate waste induced problems?	binary	10 (100%)	1	
3.2.3. Does the plan include at least one action to mitigate the negative impacts of transportation?	binary	10 (97%)	1	
3.2.4. Does the plan include at least one action related to mitigating urbanization problems?	binary	10 (94%)	0.94 ³	reconciled
3.2.5. Does the plan include at least one action to limit consumptive activities such as hunting, fishing and timber harvesting?	binary	0 (53%)	1	
3.3. <i>Institutional and administrative capacity</i>				
3.3.1. Does the plan include at least one action related to the efficiency of the environmental institutions?	binary	10 (78%)	1	
3.3.2. Does the plan include at least one action related to increasing coordination?	binary	10 (81%)	0.82	reconciled
3.4. <i>Environmental education awareness, public health and recreation</i>				
3.4.1. Does the plan include at least one action related to environmental education awareness?	binary	10 (100%)	1	
3.4.2. Does the plan include at least one action related to improving public health in relation to environmental pollution?	binary	10 (75%)	0.836	reconciled

3.4.3. Does the plan include at least one action to improve recreational opportunities?	binary	10 (97%)	0.97 ³	reconciled
4. Public participation in plan creation				
4.1. Does the plan include a separate section that describes the public participation process during the preparation of the plan?	three-level ordinal	5 (91%)	1	
4.2. Does the plan identify relevant stakeholders (i.e., public officials, private companies, NGOs, etc.)?	three-level ordinal	10 (91%)	1	
4.3. Does the plan include a section that explains why the stakeholders identified in the plan were involved?	three-level ordinal	5 (81%)	0.689	reconciled
4.4. Does the plan include any information about when the stakeholders were invited to participate?	three-level ordinal	10 (75%)	0.921	reconciled
4.5. Does the plan specify which participation techniques were used (i.e., workshops, surveys, preliminary drafts circulated for public comment, etc.)?	three-level ordinal	10 (72%)	0.853	reconciled
4.6. Does the plan include a section that explains whether the input obtained from the stakeholders during the participation process was included in plan?	three-level ordinal	5 (63%)	0.739	reconciled
5. Plan provisions for implementation and monitoring				
<i>5.1. Implementation</i>				
5.1.1. Does the plan include a separate section/subsection that addresses what needs to be done (any recommendations) to implement the plan?	three-level ordinal	10 (94%)	0.94 ³	reconciled
5.1.2. Are timelines for implementation generally specified?	three-level ordinal	10 (100%)	1	
5.1.3. Does the plan generally identify specific organizations with responsibility for implementation?	three-level ordinal	10 (100%)	1	
5.1.4. Are specific sources of funding identified to implement the plan?	three-level ordinal	10 (75%)	1	
5.1.5. Are specify targets for implementation identified?	three-level ordinal	10 (100%)	1	
5.1.6. Are concrete policies/actions generally presented along with cost estimations for their implementation?	three-level ordinal	0 (63%)	1	
<i>5.2. Monitoring</i>				
5.2.1. Does the plan contain a section/subsection that addresses monitoring the performance in terms of goal achievement and implementation of policies/actions?	three-level ordinal	5 (66%)	0.869	reconciled
5.2.2. Does the plan contain a section that addresses how monitoring data was collected?	three-level ordinal	5 (78%)	0.809	reconciled
5.2.3. Are timelines for monitoring generally specified?	three-level ordinal	0 (69%)	0.932	reconciled
5.2.4. Does the plan generally identify organizations with responsibility for monitoring progress?	three-level ordinal	10 (59%)	0.886	reconciled

5.2.5. Is there a plan for evaluating progress of the policies being implemented?	three-level ordinal	5 (69%)	0.813	reconciled
5.2.6. Is a method for updating the plan indicated?	three-level ordinal	5 (59%)	0.891	reconciled
5.2.7. Is there a timetable for updating the plan?	three-level ordinal	5 (78%)	0.914	reconciled
5.2.8. Does the plan contain a section that addresses public involvement in updates/monitoring?	three-level ordinal	5 (69%)	0.93	reconciled
<i>Policy Focus</i>	Coding	Mode	Alpha ¹	Decision ²
6. Maximize stability				
6.1. Does the plan use strong statements in the formulation of policies/actions that are generally mandatory?	three-level ordinal	10 (100%)	1	
6.2. Does the plan use clear language in the formulation of policies/actions?	three-level ordinal	10 (100%)	1	
6.3. Are any enforceable mechanisms (such as emissions limitations and standards, zoning ordinances and plans, regulations, etc.) specified in the formulation of policies/actions?	three-level ordinal	5 (97%)	0.94 ³	reconciled
7. Minimize uncertainty				
7.1. Are policies/actions clearly linked to specific goals?	three-level ordinal	10 (100%)	1	
7.2. Are the policies/actions clearly linked to an implementation plan?	three-level ordinal	10 (100%)	1	
7.3. Are the policies/actions consistent and mutually supportive?	three-level ordinal	10 (100%)	1	
7.4. Does monitoring include indicators to gauge goal achievement and effectiveness of policies/actions?	three-level ordinal	10 (97%)	1	
8. Integrate public priorities across jurisdictions				
8.1. Does the plan discuss intergovernmental coordination (i.e., coordination with the state/regional agencies or the state planning initiatives – vertical coordination)?	three-level ordinal	5 (69%)	0.86	reconciled
8.2. Does the plan include the main planning documents/concepts of higher institutional levels (i.e., national strategies National Strategy for Sustainable Development , national plans National Environmental Action Plan, regional plans – Regional Development Plan)?	three-level ordinal	5 (69%)	0.937	reconciled
8.3. Does the plan discuss coordination with a neighboring county (i.e., coordination with the planning initiatives of a neighboring county horizontal coordination)?	three-level ordinal	0 (75%)	0.82	reconciled
8.4. Does the plan discuss coordination with other local (from the same county) plans and programs intercommunal coordination)?	three-level ordinal	5 (88%)	0.726	reconciled

8.5. Does the plan include the main planning documents/concepts at the county level (i.e., county plans, PATJ, building ordinances)?	three-level ordinal	5 (72%)	0.924	reconciled
8.6. Are the main planning documents and concepts the local plan builds on described in detail, or is it precisely explained how the local plan conforms to these documents (independently of whether these documents come from higher institutional levels or from the municipality)?	three-level ordinal	5 (41%)	0.906	reconciled
9. Accommodate flexibility				
9.1. Are any exceptions to the general rules/regulations/recommendations addressed in the formulation of policies/actions?	three-level ordinal	0 (94%)	0.97 ³	reconciled
9.2. Are any governance mechanisms addressed in the formulation of policies/actions?	three-level ordinal	5 (100%)	1	
<i>Discourse</i>	Coding	Mode	Alpha ¹	Decision ²
10. Legibility				
10.1. Does the plan include an executive summary?	binary	10 (50%)	1	
10.2. Does the plan include a table of contents?	binary	10 (78%)	1	
10.3. Does the plan include a reference list at the end?	binary	0 (88%)	1	
10.4. Does the plan use illustrations (pictures, diagrams, maps, tables, etc.?) outside the fact base section?	binary	10 (100%)	1	
10.5. Is the plan well written, clear and concise?	binary	10 (100%)	1	
10.6. Does the plan have a visually attractive format (columns not too wide, adequate line spacing, etc.)?	binary	10 (94%)	0.786	reconciled
10.7. Does the plan discuss its purpose?	binary	0 (53%)	1	
10.8. Does the plan provide an explanation of the planning process?	binary	10 (84%)	0.892	reconciled
10.9. How did the plan score in goals articulation?	three-level ordinal	5 (56%)	0.944	reconciled
10.10. How did the plan score in policies/actions articulation?	three-level ordinal	10 (97%)	1	
10.11. How did the plan score in the implementation and monitoring provisions?	three-level ordinal	5 (66%)	0.935	reconciled
11. Accuracy				
11.1. How did the plan score in descriptive and analytical fact base?	three-level ordinal	10 (59%)	1	
12. Legitimacy				
12.1. How did the plan score regarding legibility?	three-level ordinal	5 (50%)	0.942	reconciled
12.2. How did the plan score in public participation?	three-level ordinal	5 (53%)	0.773	reassessed and reconciled
13. Sincerity				

13.1. How did the plan score in implementation and monitoring?	three-level ordinal	5 (66%)	0.935	reconciled
12.2. How did the plan score in minimizing uncertainty?	three-level ordinal	10 (100%)	1	
13.3. How did the plan score in integrating public priorities across jurisdictions	three-level ordinal	0 (66%)	0.815	reconciled
13.4. Does the plan contain a section with a discussion of how many actions were implemented?	binary	0 (59%)	1	

¹ Value of Krippendorff's alpha

² The scores from both coders were either (i) reassessed and reconciled or (ii) only reconciled and included in the analysis

³ There is a lack of variability in codes and the value of Krippendorff's alpha is misleadingly low. In such cases, authors recommend reporting percent agreement (Stevens et al., 2014)

Appendix 2

Table A2: Results of the content analysis for individual LEAPs

County	Documentation					Mean	Policy focus				Mean	Discourse				Mean
	Goals	Fact bases	Policies	Public participation in plan creation	Plan provisions for implementation and monitoring		Maximizing stability	Minimizing uncertainty	Integrating public priorities across jurisdictions	Accommodating flexibility		Legibility	Accuracy	Legitimacy	Sincerity	
Alba	0.00	5.63	8.13	6.67	7.86	5.65	8.33	10.00	2.50	2.50	5.83	7.27	5.00	7.50	7.50	6.82
Arad	5.00	3.44	10.00	6.67	6.43	6.31	8.33	10.00	3.33	2.50	6.04	7.27	0.00	7.50	6.25	5.26
Argeş	5.00	6.25	9.38	8.33	7.14	7.22	8.33	10.00	4.17	2.50	6.25	7.73	5.00	10.00	5.00	6.93
Bihor	10.00	8.44	9.38	5.83	5.36	7.80	8.33	10.00	3.33	5.00	6.67	6.82	10.00	5.00	3.75	6.39
Bistriţa Năsăud	0.00	7.50	9.38	7.50	6.07	6.09	8.33	10.00	3.33	2.50	6.04	6.82	10.00	7.50	3.75	7.02
Brăila	5.00	5.94	8.75	7.50	5.71	6.58	8.33	10.00	4.17	2.50	6.25	7.27	5.00	10.00	3.75	6.51
Braşov	0.00	8.75	10.00	5.83	8.21	6.56	8.33	10.00	5.00	2.50	6.46	7.27	10.00	7.50	8.75	8.38
Buzău	5.00	2.81	9.38	6.67	6.43	6.06	8.33	10.00	4.17	2.50	6.25	5.45	0.00	5.00	3.75	3.55
Călăraşi	5.00	7.81	9.38	8.33	3.93	6.89	8.33	10.00	5.83	2.50	6.67	7.73	10.00	10.00	3.75	7.87
Caraş Severin	0.00	8.44	9.38	7.50	6.43	6.35	10.00	10.00	2.50	2.50	6.25	6.82	10.00	7.50	6.25	7.64
Constanţa	0.00	5.63	8.13	5.83	5.36	4.99	8.33	10.00	5.83	2.50	6.67	5.91	5.00	5.00	5.00	5.23
Covasna	0.00	8.44	9.38	6.67	7.50	6.40	8.33	10.00	5.83	2.50	6.67	6.36	10.00	5.00	8.75	7.53
Dâmboviţa	5.00	8.13	8.13	5.83	6.43	6.70	8.33	10.00	3.33	2.50	6.04	6.36	10.00	5.00	6.25	6.90
Dolj	5.00	8.75	8.13	4.17	6.07	6.42	8.33	10.00	2.50	2.50	5.83	7.27	10.00	5.00	3.75	6.51
Galaţi	0.00	3.44	10.00	6.67	6.79	5.38	8.33	10.00	5.83	2.50	6.67	6.82	0.00	5.00	5.00	4.20
Giurgiu	5.00	6.88	8.13	9.17	7.86	7.41	8.33	10.00	8.33	2.50	7.29	8.64	5.00	10.00	10.00	8.41
Harghita	0.00	5.63	10.00	6.67	7.14	5.89	8.33	10.00	5.83	2.50	6.67	6.36	5.00	5.00	8.75	6.28
Hunedoara	0.00	5.00	5.63	8.33	5.71	4.94	8.33	10.00	4.17	2.50	6.25	3.64	5.00	5.00	3.75	4.35
Iaşi	0.00	9.06	10.00	8.33	6.43	6.76	8.33	10.00	5.00	2.50	6.46	6.82	10.00	7.50	7.50	7.95
Maramureş	5.00	8.13	9.38	6.67	7.86	7.41	8.33	10.00	4.17	5.00	6.88	8.64	10.00	7.50	7.50	8.41
Mehedinţi	5.00	7.50	9.38	3.33	6.07	6.26	8.33	10.00	4.17	2.50	6.25	6.36	10.00	2.50	3.75	5.65
Mureş	0.00	6.56	8.75	5.83	5.36	5.30	8.33	10.00	0.00	2.50	5.21	5.91	5.00	5.00	3.75	4.91
Olt	5.00	9.06	8.75	7.50	6.43	7.35	8.33	7.50	3.33	2.50	5.42	6.36	10.00	7.50	3.75	6.90

Satu Mare	10.00	9.06	8.75	6.67	5.36	7.97	8.33	10.00	4.17	2.50	6.25	6.82	10.00	5.00	3.75	6.39
Sibiu	5.00	8.13	10.00	6.67	5.36	7.03	8.33	10.00	7.50	2.50	7.08	8.18	10.00	7.50	8.75	8.61
Suceava	5.00	9.38	8.13	6.67	6.43	7.12	8.33	10.00	6.67	2.50	6.88	7.27	10.00	7.50	7.50	8.07
Teleorman	5.00	8.75	8.13	8.33	7.14	7.47	8.33	10.00	4.17	2.50	6.25	7.73	10.00	10.00	5.00	8.18
Timiș	5.00	7.81	10.00	6.67	6.07	7.11	8.33	10.00	5.83	2.50	6.67	7.27	10.00	7.50	5.00	7.44
Tulcea	0.00	7.50	10.00	7.50	4.29	5.86	8.33	10.00	4.17	2.50	6.25	5.45	10.00	7.50	5.00	6.99
Vâlcea	5.00	7.50	8.13	5.83	5.71	6.43	8.33	10.00	0.00	2.50	5.21	8.18	10.00	7.50	3.75	7.36
Vaslui	5.00	5.94	8.75	7.50	6.07	6.65	8.33	10.00	3.33	2.50	6.04	6.36	5.00	7.50	3.75	5.65
Vrancea	5.00	5.94	9.38	7.50	7.50	7.06	8.33	10.00	4.17	2.50	6.25	7.73	5.00	10.00	5.00	6.93
Mean	3.44	7.10	9.00	6.85	6.33		8.39	9.92	4.27	2.66		6.90	7.50	6.95	5.55	
Standard deviation	2.96	1.76	0.94	1.21	1.01		0.29	0.44	1.79	0.61		1.01	3.36	1.98	1.98	

