Lebanese Landscape Sustainability Assessment

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In the absence of a holistic view of landscape sustainability, credible data and consistent information are needed to help decision-making and support adaptive landscape management. This course of events highlights a strong need for a tool (system of standards and controls) that can be used by multiple stakeholders (such as NGOs, public authorities, cooperatives, associations, higher education institutes, etc.) to analyze the state and sustainability of landscapes, predict any impact of new projects on the landscape, and develop urban and peri-urban planning policies. However, while consolidated tools of assessment exist, they exhibit complexity in their references. Existing assessment tools also lack specificity and are primarily limited to qualitative approaches. Although large sets of indicators are available and can be adopted, it is crucial to select a new set of non-conventional indicators that provide a holistic view of the various dimensions of the landscape.

landscape indicators landscape sustainability landscape assessment weighting and aggregation

1. The Term Landscape

The term “Landscape” was considered in many disciplines like environmental sciences, agroecological sciences, socioeconomical sciences, and territorial policies. Landscape is multipurposed [1], thus many theories are applied. It is a geographically wide area that correlates with human perception [2] due to the aesthetic appearance and the many visible structures of a territory [3]. A given landscape is the result of how a population uses it and perceives it [4][5]. At the same time, it is impacted by natural processes and man [6], who has shaped it over millennia by his activities.

Hence, landscapes are dynamic and in continuous change [4][7][8], and develop interactively with the human societies occupying it [9]. So, it became a necessity to claim their right and responsibility toward landscape protection, management and planning [10]. And, “looking after landscape is no longer about preservation...change can be positive if planned and managed well“ [11]. But, to fulfil the landscape remit, we need to discuss all landscape facets, starting from landscape policies to landscape management planning, providing robust means of measuring the sustainability outcomes of landscapes, and landscape assessment systems.

Even though landscape is starting to be included in the policies themes and in the assessment framework, still there is a lack in tools adopting landscape indicators. Common tools are described in this article, with the emphasis

on (i) common tools for general sustainability (e.g., EIA Environmental Impact Assessment, FSA Farm Sustainability Assessment, and METT Management Effectiveness Tracking Tool) and (ii) known tools for landscape sustainability (e.g., LCA Landscape Character Assessment, LPS Landscape Character Assessment, LQ Landscape Quality, LVIA Landscape & Visual Impact Assessment).

2. Meaning of Sustainability

Two perspectives on the sustainability concept are commonly known in the field of sustainable development and environment literature [11]. The first considers sustainability as an aspiration rather than a state [11], in the sense that sustainability is the "direction towards the goal", and not measured in absolute terms [12][13], while the second considers sustainability as "an achievement". In this second case, sustainability is well-defined and can be measured with the use of particular criteria and defined indicators [14][15][16]. Remarkably, the two mentioned perspectives consider the definition of sustainability as a "three pillar concept" i.e., considered at a time the three dimensions of sustainability are as follows: social, economic, and environmental [17][18].

3. Sustainability Assessment Approaches and Tools

Sustainability assessment is a process [14][17] that helps decision makers and policy makers to reach sustainability and decide what should or should not be made to reach a more sustainable society [19][20]. In short, sustainability assessment provides decision makers with integrative environmental and social systems [20][21]. It considers micro- and macroscales to anticipate the short- and long-term implications of a proposed project, a suggested plan, or intended policy [22].

In other terms, it is a dynamic process that considers alternative trajectories to prioritize sustainable actions at a particular time and place [23]. To assess sustainability, there is a wide range of approaches and tools, depending on the context and scale of analysis [24], and these were discussed by Buytaert et al. [25].

4. Landscape Sustainability Assessment

To define landscape sustainability, we should firstly consider the landscape-specific ecosystem services in the long term. Secondly, the landscape must be able to constantly provide services that are essential to maintain and improve human wellbeing [26]. But regardless of the absence of common methods for (and indicators of) assessments, and despite the heterogeneity of the approaches, landscape sustainability assessment offers great opportunities [20] to be adopted in new policies or to renew political and planning culture.

The first sustainability assessment used in this regard was the Environmental Impact Assessment EIA for intervention projects, which was reinvented as Strategic Environmental Assessment SEA for territorial programs and landscape programs with an effect on the environment [27]. The latter showed importance in strategic decisions of plans, policies, and programs but unfortunately, it remains mostly voluntary for the landscape approach [27]. Most

tools known about general sustainability and Landscape sustainability were based on qualitative approaches. Researchers noticed a diversity of uses, going from adaptive and transformative to managerial and development, but none of the tools were holistic.

While sustainability at the agricultural level greatly inspired the research on landscape indicators, the case of FSA (known in French as IDEA or Indicateurs de Durabilité des Exploitations Agricoles) that, as other Agri-based policies and quantitative assessments, established the multipurpose use of agriculture and attributes the significance of ecological values, in addition to the scenic and recreational value of the rural landscape [28].

Nevertheless, the interest here emphasizes the use of landscape indicator-based assessments, as is the case of SEA. However, there is a need for quantitative formalization of the landscape, without excluding the qualitative part. According to Fisher [29], landscape plans in Germany were prepared to be used as a state of the environment and help defining development objectives.

It is only since the mid-1990s that landscape plans were used, in parallel to land use plans, to identify and overcome potential impacts [20][23][28]. Still, achieving landscape sustainability entails persistent corrections, as a result of changing societal priorities [11].

5. Defining Landscape Indicators and Their Arising Need

The need for Landscape Indicators (LIs) resulted from the necessity to evaluate and monitor various landscape aspects and their interconnected nature—human—over time, since landscapes are the interaction between the different social aspects of a population and a geographical area [30]. But, the different components of the landscape trace a specific identity, and subject it to considerable pressure. LIs are thus vital tools in identifying the qualities and criticalities of a particular area [5], and single features that express landscape change over space or time [31].

However, covering all landscape facets (the so-called dimensions of a landscape) needs interdisciplinary approach, which is a rarity in previous studies, where most published papers focused only on one or two dimensions. Also, most landscape assessments using indicators relied on the ecological indicators that differ greatly from LIs.

Transferable (not universal) LIs are favored by landscape characters (related to the characteristics of an area) [31] and are an ideal reference of assessment and monitoring [32] in that they provide decision makers and restoration practitioners with a greater understanding of modifying landscape patterns [33].

Considered as indexes, numerical values based LIs have quantifiable characteristics [34], allowing a large set of data to be minimized to a simple measure [35]. Like all indicators and indices that were developed to measure sustainable development [36], LIs are used in key international sustainability, particularly in landscape sustainability studies [37][38].

6. Relevant Landscape Indicators and Categorization

Differently from the ecological indicators that use field observations, landscape indicators emphasize land cover [33][39], landscape character [34], aspects of landscape perception, and can define social perceptions [35]. Most importantly, they take into consideration the objective and subjective approach of landscape [40].

Also, indicators and indices developed for sustainable agriculture were applicable to landscape sustainability studies but remain copious and difficult to measure [11], especially in a landscape that is interpreted as a scheme of eco-mosaics with a perceptive and identity realm. Therefore, we should merge the sustainability indicators mentioned above with historic [41], visual–social perception indicators [42] and land use indicators [39][43] to be able to explain all landscape facets and meet the current study objectives.

Before revealing the indicator sets found in the literature, the Farm Sustainability Assessment was selected from the existing tools for general and landscape sustainability to show the details of the sustainability indicators used to evaluate while using this method. FSA is based on three pillars and five key properties relating to the sustainability of agriculture [44]. The selection to showcase FSA relies on similarity with the proposed tool. It adopts a mixed methodology, an indicator base, and a quantitative method. Several indicators can be adopted as landscape indicators, while others show no direct relevance to landscape. The second indicator-based set for sustainability in agricultural farming is based on five key properties [44]: robustness, autonomy, capacity to produce and reproduce goods and services, territorial embeddedness, and global responsibility. They are also indicators, however, analytical and qualitative indicators, all relevant to landscape.

The literature reveals available landscape indicator sets and provides a categorization of indicators. According to Valánszki [45], their number is limitless and only a few studies explain how they can be used [42] and whether the measurement is quantitative or qualitative, with a stress on the choice of appropriate landscape indicators [34][46].The Landscape Observatory of Catalonia (CLoT), for example, proposed a set of 10 indicators that measure the physical changing of the landscape, the social perception, and the implementation of landscape policies [47]. Other sets dealt with only one aspect [29].

In general, indicators that describe the landscape well, particularly the characterization of the landscape, are well-studied in Europe [42], particularly in terms of the rural landscape. The objectives here were to evaluate the effects of agricultural policies, favoring land use and ecological aspects, discarding landscape-related indicators, and ignoring urban and cultural landscapes. Several countries followed the European countries and developed advanced methods to trace policies and land use mapping [21], but landscape indicators were still not well adopted. However, several technics were developed and are now commonly used in determining landscape structure (case of Geographic Information System GIS), mostly in countries that have implemented Landscape Character Assessments [46].

The Center for International Forestry Research CIFOR prepared a simple set of four groups of indicators of performance [23]. They can be applied across landscapes at different scales. According to Baral and Holmgren [23],“If all four of these are stable or improving, then we are making progress to meet sustainability targets” and using indicators from each of these groups can together assess landscape performance to stakeholders, decision

makers, landowners, and policy makers. Applicable to any landscape system, this framework defined sustainability measures of landscape performance in order to identify whether a landscape is sustainably managed or if any changes are needed to reach landscape sustainability.

While landscapes in the mindsets of Dutch, Italian, and English studies are not reduced to a physical aspect that can be measured, analyzed, monitored, or mapped. It is a human being's relation to his environment through beliefs, emotions, and senses. This explains the objective or physical qualities of a landscape in correlation with the subjective, perceptual, and sensory qualities [48].

The qualitative participation in the Netherlands was based on landscape appreciation and perception [49]. Using the Scales for Landscape Perception and Assessment SLPA methodology, the descriptions given by the public were adopted to explain all of the social, physical, and functional factors that influence them [50]. The outcome was the "seven qualities of landscape", which are unity, functional organization, possibility of using landscape for own activities, historical character, natural character, spatial dimensions, and sense impressions.

From the Italian perspective, landscapes are also considered to be what is perceived by the population and results from natural factors and human action in a given area. Italian landscape indicators for sustainable management only became consolidated with the new cultural context of the ELC [51]. What was just mentioned in the Dutch and Italian methodology is unlikely in the UK's regulation of environmental standards, which monitors a set of indicators with designated criteria. However, they were able to develop 158 "emerging indicators" for future monitoring at landscape scale [52].

7. Need for A Holistic Approach to Assess the Sustainability of Landscapes

Firstly, this study showed the increasing interest in landscape-related concepts and adoption in policies, and which landscape indicators can be developed to help assessing the sustainability of landscapes [14]. They are a non-conventional approach that can be developed at local, national, and regional scales. A holistic approach for assessing the sustainability of landscapes is still missing [53]. Even though, a large set of LIs do exist, it might be difficult to select indicators aimed at managing and monitoring the landscape, especially since it is crucial to select a new set of non-conventional indicators that can (i) take into account visual and social indicators, (ii) express qualitative and quantitative values, and (iii) give an overview on the different landscape dimensions. The interest in the European landscape assessment approach relied mainly on the similarity in the diversity of landscapes with the country of this current study, Lebanon.

It is unlikely that there is a gap in the studies on Lebanese landscapes and their sustainability and assessment. They were only mentioned in the National Master Plan of Lebanese Territory NPMLT that underlines the most important landscapes of Lebanon and emphasizes the importance of being "a part of a general policy" [54], without going further than this. Plus, landscape sustainability is only recently becoming an interest for Lebanese researchers in the landscape field, and many attempts toward landscape policy are nowadays under discussions.

Lebanon—a full voting member in the United Nations General Assembly since 1945—has established several international agreements and ratifications in this course, but these are mostly within the framework of sustainable development and the resource conservation of the Lebanese terrestrial landscapes. Most agreements are used at either the territory or reserve level. In the first case, agreements are meant for preservation or protection purposes, while in the second case, for management purposes. An exceptional national commitment to the Sustainable Development Goals SDGs must be highlighted since Integrated Landscape Management is applied.

Nevertheless, the Lebanese law 130/2019 reinforces the establishment of new protected landscapes. Considered as an essential pillar of development policy and ecotourism, Law 130/2019 consists of 23 articles aiming the prevention and protection of the natural areas in Lebanon. Five main categories are observed with no clear consideration to landscape integration, rehabilitation, or enhancement. Unfortunately, the law in Lebanon is devoid of the landscape dimension, leading to a lack in urban and rural planning, and creating inequalities and a dominance of privilege over the landscape Community contribution is highlighted in the above table, mainly in the Hima category, where protection and management of site is initiated from the community. The different existing laws have not yet mentioned landscape preservation. However, with citizen participation, the Lebanese state can enhance, classify, and protect landscapes.

Last but not least, we must underline the drastic need for a reference to the value of Lebanese landscapes, both in urban and rural areas, defining all landscape strategic frameworks. Preserving the landscape suggested herein contributes to the preservation of the visual identity and genuineness of the natural and built landscapes of Lebanon. The proposed tool in our research (the LSA Landscape Sustainability Assessment) will present a directive toward reaching sustainability and a standardization of the changing Lebanese landscapes. Landscape indicator-based, LSA will help propose concrete solutions, conservation, and/or correction at different scales.

8. Further Studies Initiated

Many issues have been raised, including the increasing interest in landscape-related concepts and the need to adopt them in territorial and management policies. Also, in the presence of different tools, a complexity of reference is shown within a chaotic field of application. Yet, most approaches are qualitative and based on environmental/agro-ecological indicators. Therefore, to objectively and quantitatively assess landscape sustainability, a need arises for a new tool based on a new adaptive set of indicators.

The selection of indicators will be based on existing and inventive indicators to show the best reference to landscape sustainability. That is the case of Landscape Indicators. Some of the large sets of indicators can be adopted, but an adaptive method should be applied. That is why what has been offered so far in terms of landscape indicators can be a good example for Lebanese Landscape Indicators (LLIs) and provide clear signs of the success or failure of proposed project and policies. They will guide decision makers to prioritize the landscape and identify the weaknesses and discrimination of strength in the landscape.

LLIs must communicate clearly and precisely the features of a landscape to the citizens of Lebanon in order to facilitate and improve their understanding. Accordingly, a mixed and holistic methodology will be applied, and different data types will be needed to fully contribute to the identification of landscapes, furthering the knowledge of existing challenges.

One must know that Lebanese landscapes show variability in characteristics, in physical aspects, and in functional requirements and they present a unique visual identity and genuine natural and built landscapes. They are an exceptional scenic reprieve in an integrative community, worthy not only management and design, but also conservation. They can be a great inspiration for an ideal set of landscape indicators.

Last but not least, the development of a non-conventional and holistic tool for the assessment of landscape sustainability is widely needed. Landscape Indicators are the main component for the success of the proposed tool and could be used by multiple stakeholders (such as NGOs, public authorities, cooperatives, associations, higher education institutes, etc.) to analyze the state and sustainability of landscapes, to predict the impact of new projects on the sustainability of the surrounding landscape, and finally to develop urban and peri-urban planning policies which respect the evolution of the landscape while keeping other attributes of quality. Further studies have already been initiated to ensure the development of this tool, to settle the right set of landscape indicators, its various implementation, and further enhancement.

References

1. Talento, K.; Amado, M.; Kullberg, J.C. Landscape—A Review with a European Perspective. Land 2019, 8, 85.
2. Forman, R.T.; Godron, M. Landscape Ecology; John Wiley and Sons Ltd.: New York, NY, USA, 1986.
3. Stevenson, A.; Lindberg, C.A.; Jewell, E.; Abate, F.R. New Oxford American Dictionary; Oxford University Press: Oxford, UK, 2010.
4. Hedblom, M.; Hedenås, H.; Blicharska, M.; Adler, S.; Knez, I.; Mikusiński, G.; Svensson, J.; Sandström, S.; Sandström, P.; Wardle, D.A. Landscape Perception: Linking Physical Monitoring Data to Perceived Landscape Properties. Landsc. Res. 2019, 45, 179–192.
5. Bruni, D. Landscape Quality and Sustainability Indicators. Agric. Agric. Sci. Procedia 2016, 8, 698–705.
6. Aziz, A.; Anwar, M. Landscape Change and Human Environment. Environ. Earth Ecol. 2019, 3, 7–12.
7. Biodiversity Route Map to 2020—Final Report. Available online: https://www.nature.scot/doc/biodiversity-route-map-2020-final-report (accessed on 1 July 2023).

8. Antrop, M. Sustainable Landscapes: Contradiction, Fiction or Utopia? Landsc. Urban Plan. 2006, 75, 187–197.
9. Förster, F.; Grossmann, R.; Iwe, K.; Kinkel, H.; Larsen, A.; Lungershausen, U.; Matarese, C.; Meurer, P.; Nelle, O.; Robin, V.; et al. What is Landscape? Towards a Common Concept within an Interdisciplinary Research Environment. eTOPOI 2012, 3, 169–179.
10. Jones, M.; Stenseke, M.; Jones, M. (Eds.) The European Landscape Convention: Challenges of Participation; Landscape Series; Springer Science & Business Media: Berlin/Heidelberg, Germany, 2011; Volume 13.
11. Baral, H.; Holmgren, P. A Framework for Measuring Sustainability Outcomes for Landscape Investments; Center for International Forestry Research: Bogor, Indonesia, 2015.
12. Bell, S. Sustainability Indicators: Measuring the Immeasurable? Routledge: London, UK, 2008.
13. Pollesch, N.; Dale, V.H. Applications of Aggregation Theory to Sustainability Assessment. Ecol. Econ. 2015, 114, 117–127.
14. Phondani, P.C.; Bhatt, A.; Elsarrag, E.; Alhorr, Y.; El-Keblawy, A. Criteria and Indicator Approach of Global Sustainability Assessment System for Sustainable Landscaping Using Native Plants in Qatar. Ecol. Indic. 2016, 69, 381–389.
15. Dahl, A.L. Achievements and Gaps in Indicators for Sustainability. Ecol. Indic. 2012, 17, 14–19.
16. Moldan, B.; Janoušková, S.; Hák, T. How to Understand and Measure Environmental Sustainability: Indicators and Targets. Ecol. Indic. 2012, 17, 4–13.
17. Hacking, T.; Guthrie, P. A Framework for Clarifying the Meaning of Triple Bottom-Line, Integrated, and Sustainability Assessment. Environ. Impact Assess. Rev. 2008, 28, 73–89.
18. Mori, K.; Christodoulou, A. Review of Sustainability Indices and Indicators: Towards a New City Sustainability Index (CSI). Environ. Impact Assess. Rev. 2012, 32, 94–106.
19. Devuyst, D. (Ed.) How Green Is the City? Sustainability Assessment and the Management of Urban Environments; Columbia University Press: New York, NY, USA, 2001.
20. Ness, B.; Urbel-Piirsalu, E.; Anderberg, S.; Olsson, L. Categorising tools for sustainability assessment. Ecol. Econ. 2007, 60, 498–508.
21. Lee, H.-S.; Park, E.-Y. Developing a Landscape Sustainability Assessment Model Using an Analytic Hierarchy Process in Korea. Sustainability 2019, 12, 301.
22. Pope, J.; Annandale, D.; Morrison-Saunders, A. Conceptualizing sustainability assessment. Environ. Impact Assess. Rev. 2004, 24, 595–616.
23. Dale, V.H.; Efroymson, R.A.; Kline, K.L.; Langholtz, M.H.; Leiby, P.N.; Oladosu, G.A.; Davis, M.R.; Downing, M.E.; Hilliard, M.R. Indicators for Assessing Socioeconomic Sustainability of Bioenergy

Systems: A Short List of Practical Measures. Ecol. Indic. 2013, 26, 87–102.

24. Acosta-Michlik, L.; Lucht, W.; Bondeau, A.; Beringer, T. Integrated Assessment of Sustainability Trade-Offs and Pathways for Global Bioenergy Production: Framing a Novel Hybrid Approach. Renew. Sustain. Energy Rev. 2011, 15, 2791–2809.
25. Buytaert, V.; Muys, B.; Devriendt, N.; Pelkmans, L.; Kretzschmar, J.G.; Samson, R. Towards Integrated Sustainability Assessment for Energetic Use of Biomass: A State of the Art Evaluation of Assessment Tools. Renew. Sustain. Energy Rev. 2011, 15, 3918–3933.
26. Wu, J. Landscape Sustainability Science: Ecosystem Services and Human Well-Being in Changing Landscapes. Landsc. Ecol. 2013, 28, 999–1023.
27. Netherlands Commission for Environmental Assessment—Annual Report 2020. Available online: https://www.eia.nl/annualreport2020/ (accessed on 5 July 2023).
28. Peano, A.; Cassatella, C. Landscape Assessment and Monitoring. In Landscape Indicators; Cassatella, C., Peano, A., Eds.; Springer: Dordrecht, The Netherlands, 2011; pp. 1–14.
29. Fischer, T. The Theory and Practice of Strategic Environmental Assessment towards a More Systematic Approach; Earthscan Publications Ltd.: London, UK, 2007.
30. Antrop, M. Geography and landscape science. Belgeo 2000, 1–4, 9–36.
31. Wascher, D.M. (Ed.) European Landscape Character Areas—Typologies, Cartography and Indicators for the Assessment of Sustainable Landscapes. In Final Project Report as Deliverable from the EU's Accompanying Measure Project European Landscape Character Assessment Initiative (ELCAI), Funded under the 5th Framework Programme on Energy, Environment and Sustainable Development; Landscape Europe: Wageningen, The Netherlands, 2005.
32. Vallega, A. Indicatori per il Paesaggio, 1st ed.; FrancoAngeli: Milan, Italy, 2009.
33. U.S. Army Corps of Engineers. UMRR Upper Mississippi River Restoration; U.S. Army Corps of Engineers: Chicago, IL, USA, 2016.
34. Ode, Å.; Tveit, M.S.; Fry, G. Capturing Landscape Visual Character Using Indicators: Touching Base with Landscape Aesthetic Theory. Landsc. Res. 2008, 33, 89–117.
35. Sowińska-Świerkosz, B.; Michalik-Śnieżek, M. Landscape indicators as a tool of assessing landscape quality. In E3S Web of Conferences; EDP Sciences: Lublin, Poland, 2020; Volume 171.
36. Mitchell, G. Problems and fundamentals of sustainable development indicators. Sustain. Dev. 1996, 4, 1–11.
37. The European Landscape Convention—Council of Europe Landscape Convention. Available online: https://www.coe.int/en/web/landscape/the-european-landscape-convention (accessed on 5 July 2023).

38. Nogué, S.; Rull, V.; Vegas-Vilarrúbia, T. Modeling Biodiversity Loss by Global Warming on Pantepui, Northern South America: Projected Upward Migration and Potential Habitat Loss. Clim. Chang. 2009, 94, 77–85.
39. Bahar Arif, M.H.; Sengupta, S.; Mohinuddin, S.K.; Gupta, K. Dynamics of Land Use and Land Cover Change in Peri Urban Area of Burdwan City, India: A Remote Sensing and GIS Based Approach. GeoJournal 2023, 88, 4189–4213.
40. Weinstoerffer, J.; Girardin, P. Assessment of the Contribution of Land Use Pattern and Intensity to Landscape Quality: Use of a Landscape Indicator. Ecol. Model. 2000, 130, 95–109.
41. Volpiano, M. Indicators for the assessment of historic landscape features. In Landscape Indicators—Assessing and Monitoring Landscape Quality; Cassatella, C., Peano, A., Eds.; Springer: Dordrecht, The Netherlands, 2011; pp. 77–104.
42. Cassatella, C.; Voghera, A. Indicators used for landscape. In Landscape Indicators—Assessing and Monitoring Landscape Quality; Cassatella, C., Peano, A., Eds.; Springer: Dordrecht, The Netherlands, 2011; pp. 31–46.
43. Bottero, M. Indicators assessment systems. In Landscape Indicators—Assessing and Monitoring Landscape Quality; Cassatella, C., Peano, A., Eds.; Springer: Dordrecht, The Netherlands, 2011; pp. 31–46.
44. Evaluating Sustainability of Farms: Introducing a New Conceptual Framework Based on Three Dimensions and Five Key Properties Relating to the Sustainability of Agriculture. The IDEA Method Version 4. Available online: https://www.researchgate.net/publication/327139177 (accessed on 5 July 2023).
45. Valánszki, I.; Ágnes, S. A landscape indicator-system for sustainable landscape management. J. Landsc. Archit. Gard. Art 2017, 46, 44–50.
46. Wascher, D. Landscape-indicator development: Steps towards a European approach. New Dimens. Eur. Landsc. 2004, 4, 237–252.
47. Sala, P. Els indicadors de paisatge de Catalunya. In Indicadors de Paisatge. Reptes i Perspectives; Nogué, J., Puigbert, L., Bretcha, G., Eds.; Landscape Observatory of Catalonia: Barcelona Spain, 2009; pp. 110–131. ISBN 978-84-613-1327-3.
48. Pelitero, A. The phenomenological experience of the visual landscape. Res. Urban. Ser. 2011, 2, 57–71.
49. Farjon, H.; van der Wulp, N.; Crommentuijn, L. Monitoring program of perception and appreciation of landscapes in the Netherlands. In Indicadors de Paisatge. Reptes I Perspectives ; Observatori del Paisatge de Catalunya: Olot, Spain, 2009.

50. Coeterier, J.F. Dominant Attributes in the Perception and Evaluation of the Dutch Landscape. Landsc. Urban Plan. 1996, 34, 27–44.
51. Malcevschi, S.; Poli, G. Indicatori per il Paesaggio in Italia. Raccolta di Esperienze, CATAP Coordinamento Associazioni Tecnico-Scientifiche per L'ambiente ed il Paesaggio. Available online: http://www.catap.eu/CATAP_Rapporto%20Indicatori%20Paesaggio.pdf (accessed on 5 October 2022).
52. Horswill, E.; Martin, J.; Guy, J.A. Establishing a Functional Framework for Monitoring Protected Landscapes; with a Case Study of English Areas of Outstanding Natural Beauty (AONB). Ecol. Indic. 2020, 119, 106806.
53. Wu, C.J.; Isaksson, K.; Isaksson, K.; Antonson, H. The Struggle to Achieve Holistic Landscape Planning: Lessons from Planning the E6 Road Route Through Tanum World Heritage Site, Sweden. Land Use Policy 2017, 67, 167–177.
54. CDR—National Physical Master Plan. Available online: https://www.cdr.gov.lb/en-US/Studies-and-reports/National-physical-master-plan.aspx (accessed on 5 October 2022).