

Article

EIA Effectiveness in Sensitive Alpine Areas: A Comparison of Winter Tourism Infrastructure Development in Germany and Austria

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Abstract: The paper analyses the effectiveness of the environmental impact assessment (EIA) in sensitive alpine environments by studying processes and selected case studies in Austria and Germany. The framework used to evaluate the respective effectiveness is based on four dimensions of effectiveness: procedural, substantive, transactive and normative. The study is based on semi-structured interviews, workshops with key stakeholders and textual analysis of EIA documents, as well as the analysis of legal documents. The findings reveal significant differences between the two countries leading to lower transactive and lower normative effectiveness in Austria. The framework demonstrates its high suitability for analysing EIA effectiveness and for developing recommendations. The outcomes also underline the significant influence of the project type.

Keywords: entrepreneurial perception; screening; scoping; administrative processes



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1. Introduction

The implementation and application of the environmental impact assessment (EIA) have been issues of research for more than 30 years (e.g., [1–7]). Past research, on the one hand, has acknowledged and studied the respective national political cultures that support the implementation and application of the EIA, but it has also analysed commitment, administrative and methodological concepts and resources (e.g., [1,8–13]). While the assessments of EIA processes particularly focused first on the methods of impact prediction, current research focuses on improving the procedures of application by addressing the integration of the EIA into broader environmental decision-making processes, sustainable development and resilience (e.g., [1,4–6,14–18]).

Early EIA evaluation studies focused on what has been labelled the ‘procedural’ effectiveness of EIA, examining the extent to which EIAs are conducted in line with legal frameworks or principles of best practices (e.g., [4]). Later, the ‘substantive’ effectiveness of EIA was analysed, studying the extent to which EIA practices achieve the substantive objectives of this policy tool, such as the consideration of environmental conditions and their mediation in the process. In this context, several papers address EIA effectiveness in protected and/or sensitive environments [7] e.g., in the Arctic Circle (e.g., [19]), the European Alps (e.g., [20]) or the Himalayan area (e.g., [21]).

Recent research suggests establishing a more multidimensional and integrative approach when evaluating EIA effectiveness. Beside procedural and substantive effectiveness, it is recommended to also consider the transactive and normative effectiveness of EIA, including aspects of pluralism and learning [7,22,23]. These aspects are still perceived as serious research gaps. Loomis and Dziedzic [24] underline that the transactive dimension requires more study, specifically the cost efficiency of EIA.

The paper at hand aims to study the situation in the Alpine part of Austria and Germany in an integrated manner, considering the different aspects of effectiveness.

Research on effectiveness recommends focusing on specific development sectors, e.g., [25], to make the outcomes more comparable and applicable. Against this background we focus on one type of project in winter tourism, as suggested by several authors (e.g., [25,26]).

The main aim of the paper is:

1. to analyse EIA effectiveness for Germany and Austria based on four dimensions of effectiveness: procedural, substantive, transactive and normative;
2. to suggest possible improvements to enhance effectiveness in the respective countries; and
3. to discuss the consequences of insufficient transactive and normative effectiveness.

Overall, the findings should contribute to research on effectiveness from a methodological and empirical point of view.

First, the literature review explains the definition of effectiveness. The following methodological section presents the selected case studies and the evaluation framework. Based on the result section describing the situation in Austria and Germany, the effectiveness in the two countries is evaluated. Finally, the methodological approach, the recommendations and the need for further research in this field are discussed.

2. Evaluating EIA Effectiveness

Many research papers analyse and discuss the effectiveness of the EIA (e.g., [1,3,4,7,13,26,27]). In the context of EIA, effectiveness has been defined as “something which works as intended and meets the purpose for which it was designed” ([1], p. 6). However, in the context of EIA, the terms ‘efficiency’, ‘efficacy’ and ‘effectiveness’ are also used to describe its relevance and impact. Elling ([27], p. 125) recommends distinguishing properly between these terms and considering the different understanding behind each one. Efficiency mainly describes ‘being economical in resources to achieve a given goal, whereas efficacy refers to meeting targets without any further reference to the cost of meeting them . . . Effectiveness in EIA means setting the right targets and meeting them with the right means in the process of implementing a project . . . with environmental caretaking’. In this definition, the connotation of the word ‘effectiveness’ refers to the outcome of the effects to implement and to protect [27]. The purpose of the EIA is laid down in the respective national legislation and in the Directive of the European Union. However, the ‘main purpose’ has been an issue for research and defined differently over the time.

The most common understanding of an effective EIA is when the purpose of avoiding environmental damages and contributing to a more or less sustainable development has been achieved [3,28,29]. (This is often called ‘direct effectiveness’ of the EIA [10] and includes informed decision making. Other authors highlight that the concept of effectiveness includes the aforementioned substantive environmental outcomes, and in addition the application according to specific procedural criteria and steps [4,13]. Besides this direct, substantive and procedural effectiveness, some authors also refer to incremental or indirect effectiveness [4,10]. In this case, the effectiveness of the EIA is assessed by looking at changes in mindsets, in the level of awareness, the organizational setups, the influence of stakeholders and the culture that drives planning [4,30].

Morgan ([6], p. 10) highlights that any evaluation of EIA effectiveness is only meaningful when considering the socio-economic, political and cultural contexts of the respective states, country or countries concerned. In Europe, the context of the overarching framework of the EIA directive by the European Union also needs to be considered. The socio-economic, political and cultural contexts should consist of the role of various actors, their intents and power positions throughout the process on one hand and the influence due to good governance and social and political learning as a result of the EIA application on the other.

Several authors argue that examining EIA effectiveness has moved from the focus on direct substantive outcomes, beyond mechanistic process-oriented models, to those including other factors such as values, collaborative processes and power relationships (e.g., [6,27,31]). These research trends are reflected in Table 1.

Table 1. Frameworks for an integrative approach to study EIA effectiveness (expanded from [23]).

Framework for	Dimensions of Effectiveness	Related Publications
Empirical research	Substantive	[32]
	Substantive and transactive	[33]
	Procedural, substantive and transactive	[7,34]
	Procedural, substantive, transactive and normative	[35,36]
	Procedural, substantive, transactive and normative including aspects of pluralism, knowledge and learning	[24,37–41]

For the evaluation of EIA processes, the following dimensions of effectiveness have been used in the last decade.

The overview in Table 1 shows that, in recent years, the systematic evaluation of effectiveness using an integrative approach considering the different dimensions of effectiveness (procedural, substantive, transactive and normative) has increased in importance. The presented dimensions also emerged as an important aspect to promote improvements in the EIA system [23,35,42,43]. According to Bond and Pope [44], context and pluralism have gotten more attention over time.

3. Methodological Approach

3.1. Selection of Case Studies

The area selected for the evaluation of EIA effectiveness consists of two Alpine countries: Germany and Austria. These two countries seem suitable for a comparison as they

- share the same sensitive Alpine environment,
- provide the same product development in tourism,
- are characterized by different EIA concepts and
- both share the same guidance by the European EIA directive.

The focus on one type of project contributes to better comparability and facilitated the discussion with stakeholders. The comparison was also an important means to get different stakeholder groups interested in the subject, since the ski resorts on both sides of the Austrian–Bavarian border are in competition with one another.

For the evaluation in detail, we used the EIA process for two ski resorts with comparable development, one in each country (in Austria the EIA process for the planned enlargement of the resort Schmitten in Zell am See in Salzburg, in Germany the EIA process for the planned development for the resort Sudelfeld in Bayrischzell in Bavaria). Both development plans have been the matter of court proceedings, with the result that the EIA processes should not be criticized. In addition, we used the EIA database in Austria and other EIA processes in German ski resorts in Garmisch-Partenkirchen, Ruhpolding and Reit in Winkl to double-check the main findings (e.g., [45,46]).

3.2. Operationalizing the Evaluation of EIA Effectiveness

In order to apply an integrative approach, we developed a framework based on a literature review and the research by Bond et al. [43]. Table 2 gives an overview of the applied dimensions of effectiveness, the respective definition, the key questions behind each dimension and the indicators used to assess the situation in the respective countries and cases.

Table 2. Framework for the integrative approach to study EIA effectiveness (after [23,41,47,48]).

Dimensions of Effectiveness	Definition	Key Questions	Indicators
Procedural	Indicates the extent to which the assessment process properly follows established, or legally mandated, procedures	Have appropriate processes been followed, that reflect institutional and professional standards and procedures? Does the EIA process conform to established legal provisions and principles?	<ul style="list-style-type: none"> Established professional standards and procedures Accepted good practice Scoping process Considered alternatives
Substantive	Indicates the extent to which the goals or objectives of the assessment process have been met (this might signify a more sustainable, environmentally friendly outcome)	In what way, and to what extent, does EIA lead to changes in process? To what extent does the EIA lead to changes in process, action and outcomes?	<ul style="list-style-type: none"> Screening process (number of applications of EIA) New alternatives Mitigation measures identified and incorporated Consideration in the decision-making Incremental substantial outcomes
Transactive	Considers the extent to which the substantive outcomes are delivered efficiently in terms of cost and time	To what extent, and by whom, is the outcome of conducting EIA considered to be worth the time and cost involved? Does the EIA process deliver these outcomes at least cost in the minimum time possible, i.e., is it effective and efficient?	<ul style="list-style-type: none"> Duration Time Perceived effectiveness
Normative	Shows the extent to which the assessment facilitates the achievement of the normative goals. Normative goals are those which are derived from a combination of social and individual norms	Does the assessment meet the expectations of stakeholders, irrespective of the sustainability discourse they align with?	<ul style="list-style-type: none"> Contribution to sustainable development Meeting general societal expectations
Pluralism	Explains the fact that different actors have different values regarding desirable decision outcomes, and related ethical premises	How, and to what extent are affected processes and concerned parties accommodated into, and satisfied by, the EIA process?	<ul style="list-style-type: none"> Providing opportunities for public participation and exchange beyond basic legal requirements
Learning and Knowledge	Refer to the recognition that EIA processes might facilitate learning in various forms.	How, and to what extent, does the EIA process facilitate learning processes?	<ul style="list-style-type: none"> Learning leads to direct and indirect outcomes

3.3. Methodological Approach

For the comparison of the EIA in the Austrian and German Alps, we analysed the legal documents in the respective countries as well as further documents, such as guidelines for facilities for winter tourism and typical infrastructure (e.g., cable car and ski slopes). The outcome was verified by examining characteristic case studies in the two countries, e.g., based on the EIA database provided by the Austrian environmental agency or by contacting developers and planners. The contextual evaluation was based on additional semi-structured interviews and two workshops with key stakeholders, developers, planners and lawyers, including representatives of the Austrian Chamber of Economy, members of the international organization of cable car enterprises (OITAF: International Organization for Transportation by Rope) and the cable car association. The workshop focused

mainly on the scoping process, the consideration of alternatives, the screening process, the consideration in the decision making, possible incremental outcomes, typical duration, time frames and the perceived effectiveness. Furthermore, we discussed the respective societal perception, learning processes and the relevance of participatory processes. Overall, the workshops were based on the key questions presented in Table 2.

4. Results

4.1. Overview of EIA in Austria and Germany

4.1.1. General Concept

First, the basic concepts in Austria and Germany are presented. Against this background, specific aspects related to the key questions and indicators can be answered.

Austria implemented the EIA in 1993 before joining the European Union. Due to its membership in the European Union, the EIA law was adapted several times. The current consolidated version was published on 12 January 2018 (see [49]).

The Austrian EIA process is characterized by a so-called one-stop-shop principle. This principle ensures that, during the EIA process, all different other legal requirements are considered and integrated. The developer must provide the EIA report. The Ministry of Environment published several guidelines to support the respective planning and assessment processes. The guideline for winter sports development is one of these ([50]). The overall evaluation of the EIA report is tasked to selected experts with specific knowledge in the respective environmental issues and is summarized by the competent authority. The additional fees for these selected experts must also be covered by the developer ([49] § 12 Abs. 3 UVP-G 2000). The results of the EIA process should be considered in the final decision making ([49] § 17 Abs. 4 UVP-G 2000) by the respective administration. A negative decision is required if significant impacts are likely to occur, which cannot be avoided nor mitigated. Besides the public interest concerning the overall environmental conditions, main aspects of other relevant legal obligations should also be part of the overall trade-off and decision-making.

The first German EIA law was implemented in 1990 and was adapted several times. The current version was published on 10 September 2021 ([51], p. 4147). The EIA law is linked to other laws and regulations at the national and regional level, including the thresholds and requirements for an EIA [52].

In contrast to Austria, the EIA in Germany is not a stand-alone process but is embedded in an overall administrative process with two-step decision making. The process must be coordinated and led by the competent authority, which is mainly responsible for the overall approval. The developer has to provide the environmental impact report and to cover all costs. In contrast to Austria, the EIA report is normally evaluated by the respective authorities involved. The summary of the expected impact, the required mitigation and compensation measures, including the evaluation reports and the public consultation, are provided by the competent authority. This final report should be considered in the overall decision-making process. However, a negative outcome of the EIA does not automatically lead to a negative final decision, because an overall negative result in the EIA has no substantive legal effect.

The EIA is only the first step of the required planning process. The only legally binding step is the plan following the EIA: the specific landscape plan that might also include a modified planning concept as a result of the EIA and the consultation process. This plan also includes detailed regulations on compensation measures. This specific landscape planning is required for the overall approval ([53] § 17 Abs. 4 BNatSchG). Additional documents and permits (e.g., for freshwater usage or deforestation) might be needed. The main role of the EIA is to evaluate the overall feasibility from an environmental perspective. Therefore, the EIA is also a suitable platform to test possible alternatives and different planning options.

4.1.2. Screening

In its Annex II, the EIA directive lists mandatory EIAs for facilities for tourism and outdoor recreation, such as ski runs, ski lifts, cable cars and associated developments, such as marinas or theme parks. This also encompasses the change or enlargement of these infrastructures (see Annex II, 12 and 13). Furthermore, the European Union gives clear advice to their member states, e.g., what type of areas of high environmental or cultural value should be protected by the national EIA law.

The legal concept and the defined EIA obligation significantly differs between Austria and Germany. Table 2 describes the differences in detail.

In Austria, the overall understanding of the term ‘ski resort’ encompasses both ski runs and transportation infrastructure. Therefore, the legal definition of the EIA obligation in Austria always combines the two elements, while the legal requirements in Germany for the Bavarian Alps distinguish between ski runs, infrastructure and facilities for artificial snow making. The analyses of case studies in the Bavarian Alps in Germany revealed that, beside the nature conservation law, water law, and the train and cable car law, additional legal thresholds needed to be checked, e.g., in the case of extended land fill or deforestation. Here, Austria provides a much more transparent structure in the Annex of the EIA law (see Table 3).

Table 3. EIA obligation for winter tourism development (ski runs, cable cars, lifts and artificial snow making devices) in Austria and Germany law ([49,51]).

Country	Austria		Germany (in the Alpine Area: Bavaria)	
Respective law	Annex I EIA law 2000, For changes and cumulation see § 3a Abs. 6 EIA law		EIA obligation is split in Bavaria For ski runs, the Bavarian Nature Conservation Law (Art. 6f) applies For cable cars and lifts, the Bavarian railway and cable car law (Art. 21 Abs. 2–4) applies For artificial snow making devices, the Bavarian water law (Art. 35 Abs.4) applies	
EIA Obligation	General EIA Obligation	Case-by-Case Decision	General EIA Obligation	Case-by-Case Decision
New development	<ul style="list-style-type: none"> - In glacier areas, if consuming new areas for ski runs or for cable car infrastructure - ski resorts if consuming and changing areas for ski runs and cable car infrastructure of more than 20 ha 	<ul style="list-style-type: none"> - Cable car and ski lifts or ski runs in areas under protection (such as Natura 2000 sites, protected areas and forest and UNESCO World Heritage sites), if consuming and changing areas for ski runs and cable car infrastructure of more than 10 ha 	<ul style="list-style-type: none"> - Ski runs of more than 10 ha, of more than 5 ha in protected areas, Natura 2000 sites, protected biotope types, or if main parts are constructed in areas above 1800 m altitude - cable car and ski lifts if transporting more than 1000 p/h in one direction for ski lifts or 2200 p/h in one direction for all other types of cable car, - if the direct distance from the lowest to the highest altitude exceeds more than 1000 m for ski lifts and 2500 m for all other types of cable car - in Natura 2000 sites, national parks, nature conservation areas or protected biotope types the aforementioned thresholds should be reduced by half - artificial snow making if covering more than 15 ha - 7.5 ha in protected areas, Natura 2000 sites, protected biotope types or—if main parts are located above 1800 m above sea level 	—

Table 3. Cont.

Changes or enlargements	if the above thresholds are met or exceeded with the changes	When expanding a ski area, a case-by-case assessment is carried out if areas of 10 hectares or 5 hectares in protected areas are affected. However, this also only applies if the authority ascertains in the individual case that the change may lead to significant harmful effects on the environment	<p>Ski runs:</p> <ul style="list-style-type: none"> - if the enlargement exceeds the aforementioned thresholds for ski runs - if the combination of the existing and the planned enlargement exceed the thresholds for ski runs, except those that had already existed two years before <p>Ski lifts and cable car:</p> <ul style="list-style-type: none"> - if the number of persons transported is doubled and exceeds the respective thresholds <p>Artificial snow making:</p> <ul style="list-style-type: none"> - if the artificial snow making exceeds the aforementioned thresholds - if the combination of the existing and the planned artificial snow making exceeds the thresholds, except the facilities that had already existed two years before
Cumulation		All areas that have been approved within the last 5 years ('recalculation period') must be considered. However, the prerequisite for carrying out an individual assessment is that the project applied for has a size of at least 5 hectares or 2.5 hectares in protected areas.	Development in the last 2 years needs to be considered (e.g., ski run, artificial snow making)

A screening process in Austria begins if the developer applies for a specific project type, but the procedure to determine the EIA obligation may also be started by local or regional administrative bodies, the Austrian environmental advocacy offices (Umweltanwalt) or the local government (S. 14). The law states ([50] see § 3 (7) EIA law 2000) that only a rough evaluation is required. The decision needs to be made within a time frame of six weeks. If the related administration decides that the planned development will not require an EIA, legally accepted environmental NGOs may ask for a court to decide [54].

The screening process in Germany is regulated in the EIA law ([51] § 3a EIA law). The related administration starts the process if the developer applies for a project approval, or as a part of a developing process. In contrast to Austria, the authority makes the decision based on suitable information by the developer and their own information. They have to make a decision immediately and document it in detail. The opportunities to oppose this decision (even in court) are rather limited because the judicial assessment will only focus on the documented process and its transparency and not on the project or the environmental conditions as such. An involvement of other institutions, NGOs or regional authorities in the screening process is not foreseen in this case.

4.1.3. Scoping

The scoping can be regarded as the most important stage in the EIA [3,47,55,56]. Sadler ([47] p. 113) identified the main challenge of any scoping, i.e., an EIA is not intended to produce an exhaustive assessment of each potential impact but describe and concentrate on significant environmental effects.

However, according to the directive and the many positive experiences, scoping in Austria is only mandatory when the developers or another member state ask for it. In Austria, the developer may apply for a pre-process ([50] §4 EIA law 2000). This application should include a brief description of the project and a concept of the environmental impact study. The authority has a maximum amount of 3 months to provide a response, which should highlight deficiencies and request additional information. The authority may also provide further relevant information if the developer asks for it.

In Germany, the scoping process is perceived as an important and crucial phase regulated in the EIA law [51] (§5 EIA law). The main goal is to get a consensus on the alternatives, the methodological approach and the affected area [57]. Therefore, typically the main part of the scoping process is a meeting or workshop with an interactive exchange of all relevant administrative bodies and relevant local authorities. The scoping process often includes experts, affected communities or NGOs [57]. The main outcome of this or these meetings is a protocol describing the information to be provided by the developer, the alternatives to be considered, the environmental issues and specific subjects to be analysed in detail, and the spatial area that should be considered in the environmental impact study. The administration must provide any relevant additional information to the developer. Although the protocol is formally not a binding document, in practice it is handled as such. Therefore, several authors perceive the scoping process in Germany as a contribution to facilitate the process and to save time and money [57,58].

The differences between the two countries are visualized in Figure 1. The pre-process in Austria does not preclude that the number of environmental issues and additional aspects may be expanded during the following process, whereas in Germany the possible number of issues to be assessed is reduced to those which are perceived as crucial and significantly affected.

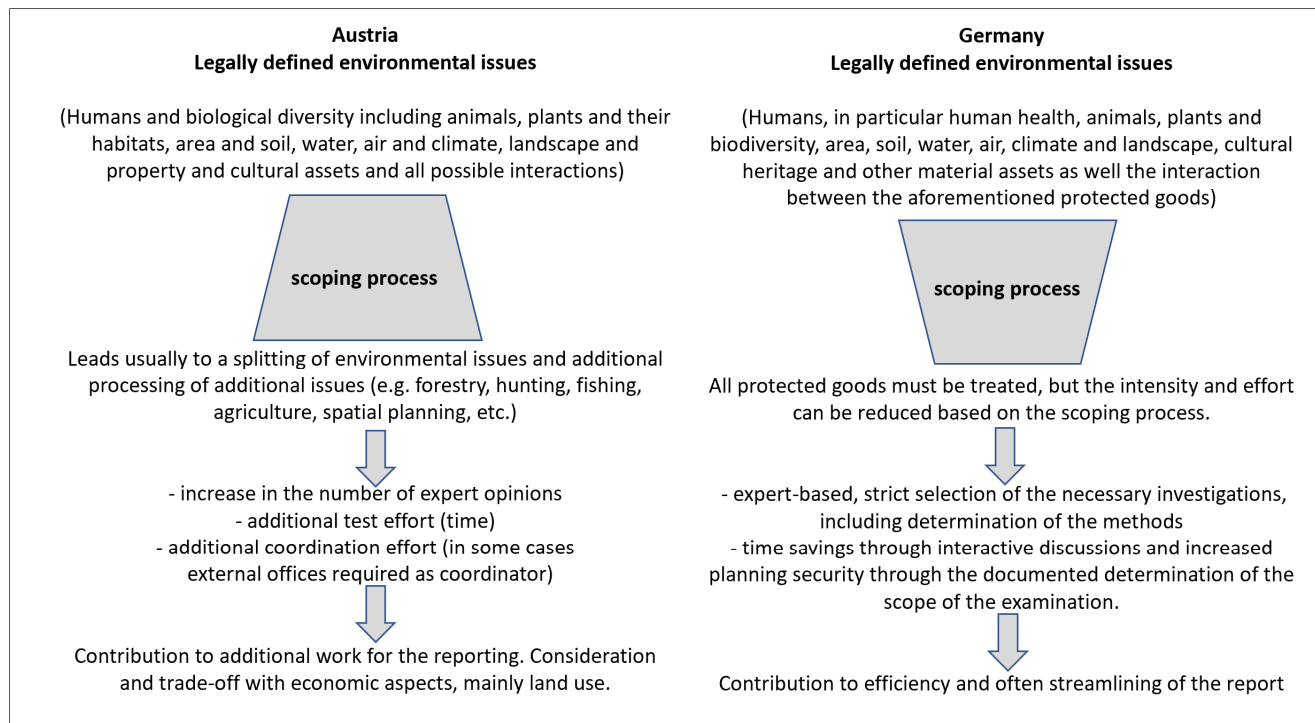


Figure 1. Visualization of the different outcomes of the scoping process in Germany and Austria.

The consequences of the different scoping processes can be seen in many case studies. In Austria, the scoping process has led to additional issues being considered (exceeding the legal requirement of the Austrian EIA-Law), such as agriculture, fishing, housing development,

hunting or traffic. Therefore, economic losses are also to be evaluated beside the environmental aspects, and the number of experts involved in the report increases significantly.

The different scoping processes also have consequences for the EIA report and the public participation. In contrast to Germany, an early participation of external experts, communities or NGOs is not foreseen in Austria. The analyses of German case studies revealed that the methodological approach, the expected impacts and possible alternatives have been discussed with the local conservation council (consisting of local environmental experts and members of NGOs) and with the respective administration.

4.1.4. Identification and Evaluation of Key Impacts and Reporting

The report should be written and structured in a transparent manner. At least the respective summaries should be easy to read to facilitate public participation and political decision-making [52,57].

Due to the one-stop-shop principle in Austria, the EIA encompasses all required approvals. However, consequently, the provided information on the project (and for possible alternatives) must be provided in a very detailed manner. This includes, on the one hand, the description of the project (and its alternatives or technical variations), and the prospects of possible effects and the proposed measures for mitigation and compensation on the other hand.

The one-stop-shop principle, in combination with the extended environmental issues presented in Figure 1, leads to extremely large documents.

In Germany, the situation is different. The scoping process contributes to a focused description of possible effects leading to shorter reports. However, the report typically includes alternatives. The reader of the report should understand which alternatives have been evaluated and which evaluation criteria were used. Therefore, the EIA may lead to possible modifications of the project during the process. The measures for compensation and mitigation have to be drafted in the EIA [57]. Typically, only the main outcomes of additional documents are included in the report in order to keep the provided information transparent and user friendly. The different additional documents (e.g., on emissions) are available for the public.

4.1.5. Administrative Process

The assessment process by the administration based on the finalized EIA study (report) in Austria and Germany is presented in Figure 2. In Austria, the EIA is submitted to the competent authority which sends out the EIA study to the Ministry of Environment. The Environmental Agency representing the Ministry of Environment does an evaluation of the study. In parallel, the different chapters are sent to external experts for their evaluation. The competent authority has to collect all of these statements and take them into consideration. The view of external experts may lead to a request for additional information. This information must be provided by the project applicant (developer) and the applicant must pay for these external evaluations in support of the competent authority. The competent authority summarizes all evaluations and compiles an overall evaluation, which is the basis for the final decision-making.

In Germany, the process is much shorter and easier because the responsibility for decision making lies with the competent authority. An additional involvement of external experts is unusual, but possible [59] (if the competent authority does not have the required knowledge for a specific aspect in house, or to speed up the process in the interest of the developer. In Bavaria, and in the context of winter tourism developments, this has never been the case.

In both countries, the main findings of the EIA are not automatically binding but are to be considered when making decisions. The public must be informed. The main goal and key aspects are identical in both countries, i.e., the precautionary principle to avoid environmental threats as early as possible [57,60].

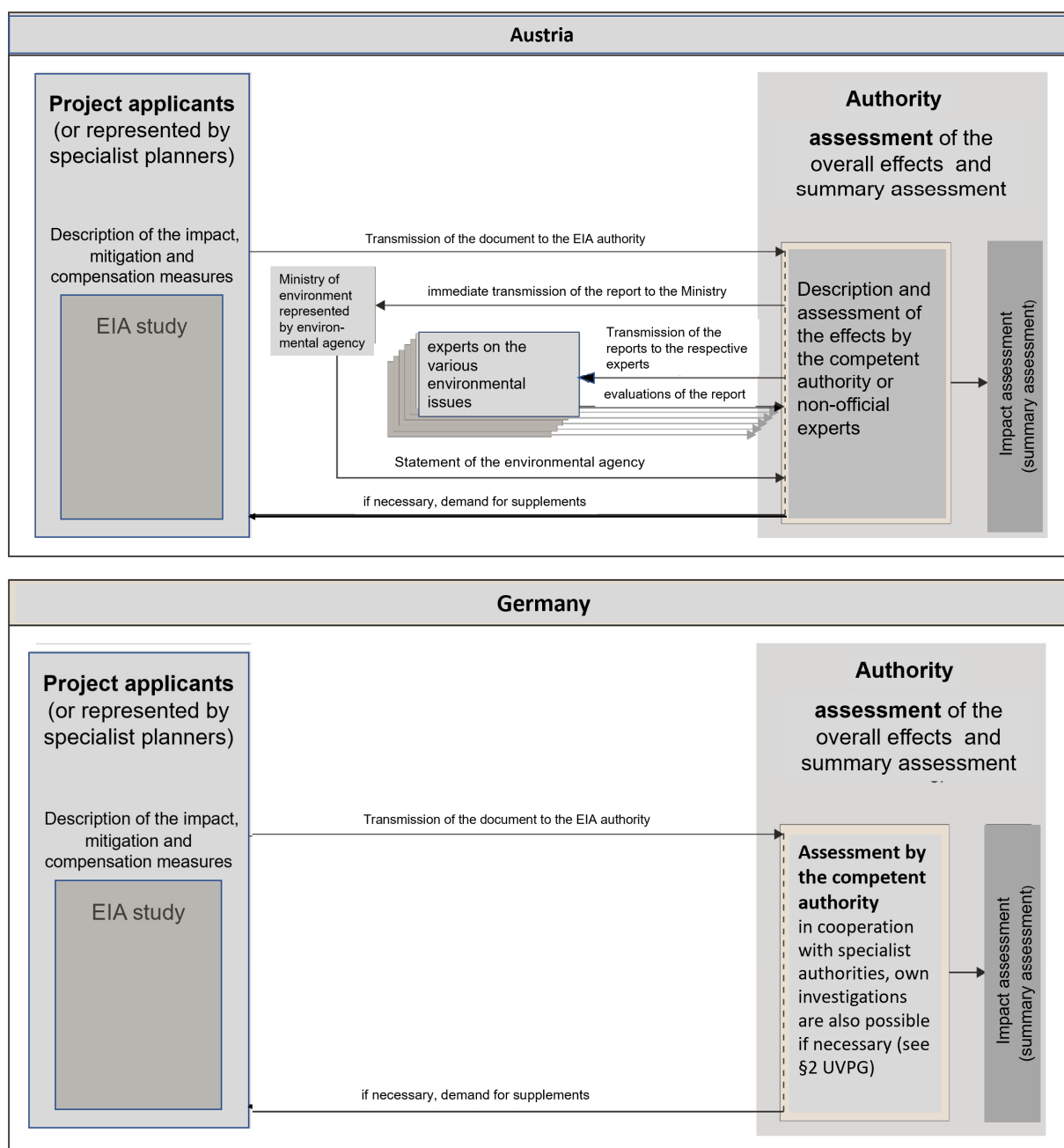


Figure 2. Assessment process in the Austria (above) and Germany (below).

4.1.6. Public Participation

In the context of public participation, one must distinguish between the general public and the concerned public. While the general public should be able to access the desired information, the concerned public should have the additional opportunity to provide comments [61]. Furthermore, the public concerned should have access to legal control options of any decisions.

In Austria, the general public can send a written comment to the competent authority when the EIA study is finalized; the process has started and been published in newspapers for at least 6 weeks. Furthermore, when the EIA assessment by the competent authority has been finalized, the public can read this document at the competent authority and in the municipalities where the project is located. Austrian EIA law also defines a regular and a simplified EIA process. The main difference is that in the latter, public participation can be reduced.

In Germany, participation is always mandatory, and is organized by the leading authority (local administrative body).

4.2. Comparison of the Respective EIA Effectiveness

The results are structured according to the list of criteria in Table 2 describing and comparing the situation in the two respective countries. After the general explanations, the effectiveness in the respective countries is evaluated in tabular form. We distinguish between high, medium and low effectiveness for each indicator based on the presented results. A high effectiveness stands for a high fulfilment of key questions and respective indicators listed in Table 2.

4.2.1. Procedural Effectiveness

In the context of procedural effectiveness, we analysed several indicators (see Table 2):

- the established professional standards, procedures and accepted, transparent and accountable processes;
- the scoping process; and
- the consideration of alternatives

Established professional standards, procedures and accepted processes: The description of the EIA process shows two different approaches: a “one-stop-shop” EIA process in Austria, and the EIA as the first part of a two-step planning process in Germany. Despite this fundamental difference, both countries provide a well-established process with standardized procedures. The European Directive also serves as a framework setting standards and minimum requirements. In Austria, the overall assessment is supported by additional independent experts. From an administrative perspective, the EIA in both countries is well established and accepted. However, due to the extensive and costly process in Austria (see also transactive effectiveness), the acceptance from an entrepreneurial perspective is rather low. In both countries, additional guidelines are provided to enhance the quality of the report. An influence of the type of project is also visible in both countries (e.g., considering wind-turbines or tourism development).

However, the EIA in the two respective countries differs significantly in the administrative process. Here, the challenges due to the excessive external evaluation process in Austria, the complex aggregation and harmonization, and the detailed information needed for the one-stop-shop principle, has led to more time consuming, more expensive and less transparent outcomes.

Scoping process: The European Directive 2011/92/EU highlights the importance of the scoping for the overall quality of the assessment, but also its importance as a tool to simplify and streamline the decision-making process. It is also the phase in which reasonable alternatives are discussed and selected for the following phases with assessment and reporting. Wood et al. ([55], p. 222) point out that the scoping process is also a phase where underlying conflicting interests become visible and the significance of environmental effects may be perceived differently by the involved stakeholders, planners, experts and the administration. The role of the scoping process in the two countries differs significantly (see Figure 1). While the scoping in Germany is used to streamline and facilitate the process, Austria offers here a rather challenging procedure with opposite outcomes. The often-criticized extended list of environmental issues [62] is even confirmed by a non-mandatory guideline for winter tourism development edited by the Austrian Ministry of Agriculture, Forestry, Environment and Water Management [63]. The consequences are reduced planning certainty, more time-consuming processes and additional coordination tasks in Austria. Therefore, in Austria, more emphasis should be given to a scoping process that differentiates those issues that require a greater-depth analysis from those that do not, to avoid double and overlapping assessments, and to exclude any economic issues (see [55], p. 239, [60], [64], p. 24). Although the involvement of additional experts, NGOs or representatives of the public is not mandatory in either country during the scoping phase, the practice in winter sports development showed that, in Germany, the option

to include these groups is generally used. This is in line with recommendations by the European Commission and with requirements in many other countries such as Finland, the Netherlands, Spain and Sweden ([55], p. 225).

The different approaches in scoping and in the administrative procedures also lead to negative consequences for public participation due to the public's late involvement and the sheer length of the documents. The significant differences within the scoping and decision-making are also reflected in the acceptance by the developers and their willingness to apply this instrument. The workshop revealed that this outcome is also true for other branches. This has been underlined by key stakeholders of the Austrian chamber of economics (WKO).

Considered alternatives: While the EIA reports are generally of high quality in both countries, including significant mitigation and compensation measures, in Austria, the consideration and evaluation of different alternatives is often missing [65,66]. This seems to be a consequence of the different scoping process and the one-stop-shop principle.

In Austria, due to the lacking consideration of alternatives, the precautionary effect of the EIA is therefore rather low [65]. According to Gstir ([67], p. 2), "The examination of possible alternatives in the EIA procedure is severely neglected". The EIA is an instrument at the project level when the planning is considered complete and the project enters the approval process. Therefore, the willingness for re-planning is usually quite low. The project applicant tries to avoid changes for economic reasons ([68], p. 379). In Germany, due to the two-step approach, the openness for the consideration of alternatives is much higher (see also the section on substantive effectiveness). Table 4 provides an overview of the procedural effectiveness in the two countries.

Table 4. Procedural effectiveness (- = low; o = medium; + = high).

Indicators	Austria	Germany
Established professional standards and procedures	+	+
Process accepted	o	+
Scoping process	-	+
Consideration of alternatives	-	o

4.2.2. Substantive Effectiveness

Substantive effectiveness refers to the extent to which the intended outcome is achieved [69]. The EIA has the overarching goal to influence decision making in favour of the environmental conditions, e.g., by selecting a less harmful alternative, through mitigating project modifications, by the definition of mitigation and compensation measures or through the full rejection of the desired project. Considerations of direct substantive effectiveness relate to the extent to which the assessment process informs decision making, e.g., whether new alternatives were identified as a result of the assessment process, whether appropriate mitigation measures were identified and incorporated and whether the assessment influences the subsequent decisions made about that proposal [22,33,35,70]. Incremental substantive outcomes could include changes to processes and awareness, as well as knowledge generation and learning [40,70].

Screening process (number of applications of EIA): Screening is the first step employed in the EIA process to establish whether or not a development will require an EIA, and is therefore a very crucial first decision [9,71]. It consists of a legal component and a related process deciding in favor or against the application of an EIA. Therefore, for the evaluation of the substantive effectiveness, a closer look at the screening process is essential.

As presented in Table 2, on the one hand, both countries used thresholds related to the project type, such as areas influenced by the infrastructure development, or thresholds related to the sensitivity of the environmental or cultural conditions at the given location. In both countries, the criteria include special thresholds for projects affecting Natura 2000 sites

and protected areas by national legislation. The increasing sensitivity in higher elevations is covered in the German (Bavarian) law by lower thresholds for projects implemented above 1800 m above sea level, and in Austria by specific thresholds for projects affecting glacier areas. The Austrian EIA law also considers UNESCO World Heritage sites. However, a closer look at these criteria shows that the desired precautionary effect is not very significant, given the high thresholds of 5, 7.5 or 10 ha for new developments in highly valuable and sensitive areas. In addition, in Austria, an EIA is not even mandatory when affecting protected areas by new developments of more than 10 ha but is rather an issue for a case by case decision.

Overall, the likelihood of an EIA application for winter tourism facilities is higher in the Bavarian Alps than in the Austrian Alps. The reasons for these differences are:

1. Overall the thresholds in Austria are significantly higher (generally, but also for projects to be developed in protected areas).
2. In contrast to Austria, the German legal documents do not include a case-by-case decision; if the thresholds apply, the EIA is always mandatory.
3. The splitting of different project types in the Bavarian law, such as cable car development or snow-making devices, in combination with lower thresholds, enhances the likelihood of an EIA. In Austria, the development of artificial snow-making devices is not perceived as a project requiring a possible mandatory EIA if it is not combined with enlargement or changes of the ski runs.
4. The relatively high and complex thresholds in Austria for changes and enlargements of resorts, in combination with the case-by-case evaluation, further decrease the likelihood of an EIA.

Regulations to avoid the splitting of projects (“salami-slicing”) exist in both countries. However, in Austria, the cumulation should consider development over a period of 5 years, whereas in Germany (Bavaria) it only encompasses the last two years. The discussion with key stakeholders revealed that two years are not an effective regulation against project splitting, and that this strategy is even actively “considered” by developers when planning a project in Germany. The thresholds and screening criteria are not an issue for complaints by developers and related key-stakeholders in either country. However, nature conservation NGOs and the alpine clubs in both countries criticize the thresholds for winter tourism development as inadequate. Experts with a legal background argue that the regulations and thresholds in the Austrian EIA law are too vague and unprecise. With this wide definition of ski resorts, it often remains unclear and open for interpretation which areas need to be included to meet (or to avoid) the respective threshold [72].

The stakeholder involvement underlined that the screening process in Germany is perceived as a fast one. The detailed legal thresholds are helpful and do not leave much room for discussion. From a developer’s perspective, the fact that decision-making only lies with the respective administration is positive, because at an early stage the required planning process is clear. The conditions in Austria are perceived as less predictable and open for external influence, e.g., by NGOs.

New alternatives: A second major aspect in favour of sustainable development and environmental production refers to the possibility of additional alternatives or modifications being considered during the EIA process, mainly during the scoping phase. This opportunity is only likely to be relevant in Germany and is indeed known from different examples in winter tourism, e.g., modified solutions for water provision (e.g., location of the lake for water supply). In Austria, the one-stop-shop principle reduces the openness for additional new alternatives significantly.

Mitigation measures identified and incorporated: In both countries, the development of mitigation and compensation measures has a high priority. All reports consider these two aspects and try to improve the environmental conditions in this respect.

Consideration in the decision-making process: In both countries, the main findings of the EIA are not automatically binding but are to be considered during the decision-making process. In Austria, the duration of the decision-making process was criticized in

the workshop (see also Section 4.2.3) In Germany, the process of decision-making was not criticized by the stakeholders.

Incremental substantial outcomes: In Austria, the one-stop-shop principle hinders the consideration of incremental substantial changes and improvements. In Germany, the EIA process can come up with recommendations which can be considered and included in the following, more detailed, planning process (“Landschaftspflegerische Begleitplanung”). Table 5 summarizes the main findings for substantive effectiveness.

Table 5. Substantive effectiveness (- = low; o = medium; + = high).

Indicators	Austria	Germany
Screening (number of applications)	-	+
New alternatives	-	+
Mitigation and compensation measures	+	+
Consideration in decision-making	+	+
Incremental substantial outcomes	-	o

4.2.3. Transactive Effectiveness

Transactive effectiveness refers to how efficient an impact assessment process is, in terms of time and cost [42]. Several authors have highlighted that a failure to demonstrate transactive effectiveness in an era of economic rationalism and cost-cutting may put at risk the future of impact assessment itself [39,73].

Time: The workshop with key stakeholders revealed that the Austrian developers complain about the high number of separate expert studies. Therefore, the report in Austria is significantly more expensive and time consuming. In addition, it also requires somebody to coordinate the various studies. The most significant difference highlighted by the Austrian developers is that they must provide very detailed information at a very early stage. If changes might become necessary, e.g., for technical reasons, all processes are affected; this also includes compensation and mitigation measures [62,74]. These changes always lead to a longer duration of the EIA processes.

German developers, on the other hand, do not perceive the EIA as a time consuming ‘burden’, because it leads to a framework for the following step of detailed planning, including mitigation and compensation measures. It is therefore also possible to consider suggestions proposed in the assessment or as a result of public participation [57] without losing much time.

The described differences are the result of the ‘one-stop-shop principle’ in Austria versus the ‘two-step approach’ in Germany, and the related differences in the scoping processes.

Furthermore, in the workshops with developers and key-stakeholders, the final administrative evaluation process in Austria was heavily criticized. The fact that the authorities don’t decide by themselves (such as in Germany) increases (doubles) the costs and is very time consuming. The analyses of several case studies in Austria illustrate this point of criticism: for the EIA process of the ski area Goldeck, this phase required an additional 4 months, and for the ski area Kappl-St. Anton, it was more than 6 months. If the external experts have different opinions to those of the EIA study, the final evaluation is difficult for the competent authority and often requires time consuming additional explanations or documents by the developer.

The discussion with key-stakeholders and developers also addressed the effect of lengthy reports on participation. The EIA documents in Austria are perceived as unreadable, with too much information, too many pages and too complex content. The additional expertise during the evaluation phase in Austria increases the provided information, which is difficult to read by the general public and the public concerned. Even the lawyers working for the developers highlight that they are often not able to read the entire report.

Developers argue that this is also one of the main complaints by the public concerned. In relation to the ‘amount of paper’, the time for participation is too short.

The discussion about the ‘right’ time and duration for participation was similar in both countries. From a developer’s perspective, one doesn’t want to ‘wake sleeping dogs too early’, as they say. They argue that many people misuse environmental arguments, especially those about endangered species, to hinder project development and related assessments. Most of the experts and developers’ legal representatives, however, argued in favour of early participation. The regular participation after the EIA report is perceived as too late. They argued that it is better to include the public concerned, and to inform the general public, as early as possible to avoid rumours and false information, to include local knowledge, and to consider public concerns at a very early stage. This is in line with the literature review [3,57]. However, this is achieved much easier in Germany than in Austria.

Costs: The long duration of EIAs in Austria is the result of the scoping process, the involvement of external experts in the decision-making phase, and the ‘one-stop-shop principle’ that requires detailed information. The workshops revealed that, as a result, the costs for the whole process in Austria are 5 to 10 times higher than in Germany, even if the costs for the second step in Germany are added. One reason for this difference is that the fees paid for an EIA-study are regulated in Germany by a scale of fees for planning tasks. The system is based on the spatial extent of the study area, starting with 50 ha [75]. Therefore, it is in the interest of planners to include alternatives. Another reason is that it is also in the interest of the planner to influence the scoping process in a way that the fields of intensive analyses are not extended. In Austria, any group involved in the process, other than the developers, has no interest in limiting the studies on the different environmental issues or to consider new issues [74]. Additional costs are caused in Austria because the competent administrative body demands many external reviews, whereas all these decisions are mainly made in-house in Germany. From a developer’s perspective, the competence of the administrative body in Germany saves a lot of entrepreneurial money compared to the situation in Austria.

Finally, efficiency and the risk of a negative outcome were discussed. Here, the German developers argued that the risk of a total failure is low because it is more likely that the project will be modified or that another alternative will be selected through the process. Therefore—from a developer’s perspective in Germany—it is not considered negative to include at least some alternatives. The one-stop-shop principle in Austria, requiring very detailed information at a rather early stage of planning, has led to a strict rejection of any alternatives in practical applications by the developers and their legal representatives. What is more, the high costs increase the pressure to be successful.

Perceived efficiency: The stakeholder involvement underlined that the screening process in Germany is perceived as fast and efficient. The detailed legal thresholds are helpful and do not leave much room for discussion. The conditions in Austria are perceived as less predictable.

While the well-organized scoping already gives some planning certainty to German developers, the process in Austria is open until the end because the environmental advocacy offices (an institution which doesn’t exist in Germany) may call for court approval at the very end. While the EIA is not beloved, it is an accepted instrument among the winter tourism developers in Germany. Conversely, the overall acceptance of EIA processes in Austria is very negative. It can best be described with two quotes by developers: ‘One must avoid an EIA like the devil tries to avoid holy water’ and ‘To be honest, I pay the planners extra money to avoid an EIA’. These findings are summarized in Table 6.

However, a look at the statistics available for Austria showed that only 3% of the projects were rejected since the year 2000. The negative perception in the field of winter tourism development is probably based on several planning processes which ended with negative decisions: the planned connection of the ski areas Lech-Warth (pre-assessed by the EC, 25.01.2013), the planned enlargement of the Schmittenhöhe in Zell am See, and the connection of St. Anton and Kappl (both court decisions negative).

Table 6. Transactive effectiveness (- = low; o = medium; + = high).

Indicators	Austria	Germany
Time (duration of the process)	-	o
Costs	-	+
Perceived efficiency	-	+

4.2.4. Normative Effectiveness

Normative effectiveness refers to whether the impact assessment process achieved its ideal, normative goals [76], which, in this context, is overall sustainable development.

Contribution to sustainable development: The workshops with different stakeholders revealed that, overall, the public perceives the EIA as an important contribution to sustainable development. The systematic compilation of environmental information and the assessment process are explicitly mentioned as important contributions. However, the stakeholders in Austria also report that the amount of required data and selected issues exceeds the public interest, because economic aspects, e.g., regarding hunting, are also included.

Meeting general societal expectations: The societal discussion about winter tourism development is rather controversial in both countries. In many cases, the general public is against new developments, enlargements or new connections if environmental impacts are likely to occur. Moreover, the public is not likely to trust in the EIA as an instrument that meets societal expectations irrespective of the overall discourse. Criticism of projects is often fundamental (e.g., the region does not need any winter tourism development). Therefore, the EIA is not likely to have a mediation function in either country. This may explain why many winter tourism development projects have become court cases (see Table 7).

Table 7. Normative effectiveness (- = low; o = medium; + = high).

Indicators	Austria	Germany
Contribution to sustainable development	+	+
Meeting general societal expectations	-	-

4.2.5. Pluralism

The framework of Bond et al. [73] includes pluralism as a distinct dimension, and one which might have an influence on the four core dimensions of procedural, substantive, transactive and normative effectiveness. The key question in this context is: How, and to what extent, are affected and concerned parties accommodated into and satisfied by the EIA? In this context, those opportunities are considered which go beyond the legal requirements in the respective countries.

Providing opportunities for public participation and exchange beyond basic legal requirements: Since this question goes beyond the need to provide opportunities for public participation in line with what is considered good practice, which is addressed as a component of procedural effectiveness, the experiences are similar to the normative outcomes. In both countries, the EIA processes for winter tourism development projects are often characterized by fundamentally different positions among the stakeholders. While local stakeholders involved in tourism might argue in favour of development, local and regional stakeholders engaged in nature conservation are usually in opposition. These fundamental differences also often limit willingness to participate in the planning process or in related meetings to improve the project outcomes.

The broad and formal process in Austria with the given time frames reduces the opportunities for local exchange and informal discussions. In the German case studies, the communities involved tried to provide an exchange platform to integrate local knowledge

and to enhance the local acceptance of the project and the related tourism development. Table 8 summarizes the findings.

Table 8. Pluralism (- = low; o = medium; + = high effectiveness).

Indicator	Austria	Germany
Providing opportunities for public participation and exchange beyond local requirements	-	-

4.2.6. Knowledge and Learning

Knowledge and learning refer to the experience that effective EIA processes may facilitate learning in various forms [39].

Learning leads to direct and indirect outcomes: Within the workshops, the entrepreneurs reported that the wide range of environmental information was sometimes surprising to them, and provided new and unexpected knowledge (e.g., about species at risk, valuable vegetation, etc.). This environmental information was partly used in the following management processes, albeit independent from the EIA processes. No differences between Germany and Austria were found. Table 9 summarizes the outcomes.

Table 9. Learning outcomes (- = low; o = medium; + = high effectiveness).

Indicator	Austria	Germany
Learning leads to direct and indirect outcomes	o	o

5. Discussion

5.1. Methodological Aspects

This framework on effectiveness has already been applied for the theoretical and empirical evaluation of EIA processes several times (see Table 1). However, an application to compare two EU member states with a higher standard and long tradition of EIA application is new. Therefore, from a methodological perspective, two aspects can be discussed. First: Is this framework generally suitable for the evaluation of different types of EIA processes? Second: Are the core elements of this framework—procedural, substantive, transactive and normative effectiveness—helpful tools in this context, to understand differences and to propose possible improvements?

The study at hand shows that this framework on effectiveness is generally very useful for the comparison of EIA processes in two countries, even in countries with an advanced standard. We believe that it is better suited than the also often used concept based on procedural and contextual aspects (e.g., [77]). One of the main reasons for choosing this framework is the significant focus on substantive and transactive effectiveness. The analysis of these two aspects requires extended stakeholder involvement and detailed analysis. In addition, overall societal trends in the context of participation are better considered. However, the presentation of the respective normative effects underlines the great influence of the project type, which is also known for other project types, e.g., in the energy sector. For a significant part of society, winter tourism development and infrastructure enlargement is not acceptable. Therefore, the study at hand confirms findings supporting a separate analysis of selected project types.

5.2. Effectiveness and Recommendations for Improvement

5.2.1. Improving Sustainable Effectiveness

Screening processes: Looking first at the main purpose of the EIA, the precautionary principle and the caretaking for human health and the environment, the comparison shows that the EIA is not applied often enough. The thresholds should therefore be improved in both countries. Significant developments, such as ski resort mergers, should be an issue for an EIA.

Scoping and development of new alternatives: Wende ([3], p. 96) analysed the effectiveness of EIAs in Germany using a regression analysis of factors possibly influencing the effectiveness of environmental impact assessment procedures and discovered three main positive factors. The scoping, with a substantive and methodological delimitation of the survey, combined with an early participation in scoping, had a positive influence on general modification of projects during planning decisions. He showed that the greater the participation of public authorities, experts and third parties in scoping, the greater the extent to which general modifications are contemplated in decision making. The third dominant factor determining the extent of mitigating project modifications was the degree to which the analysis of the project's effect was described and analysed in the EIA report. Geißler [78] analysing SEA processes confirm the presented findings on effectiveness in Germany. Analysing substantive effectiveness, they perceive the processes as an 'overall helpful tool' and state a moderate procedural effectiveness.

In Austria, the (nearly) complete exclusion of alternatives in the scoping and assessment process is also very likely to lead to those alternatives which would be less negative for the environment to be overlooked. Both these aspects may contribute to the negative evaluation of current EIA processes by NGOs [79]. These findings underline the described differences between the two countries and the need to improve the entire scoping process in Austria.

According to Dickerson and Montgomery [80], the reason for the declining number of NEPA-environmental impact assessments were the excessive requirements (see also [81], p.273). Here we see similarities to the procedure applied in Austria.

5.2.2. Improving the Transactive Effectiveness

The preamble to the directive 2014/52/EU addresses the subject of effectiveness. In this context, the EU calls for reduced administrative complexity and an increase of economic efficiency. However, Geißler et al. [78], analysing the situation in Germany, highlight that research in this respect is missing. The study at hand supports the necessity to include this aspect in future research. Here, Austria may serve as an excellent example. Against the presented findings and ongoing discussions by lawyers, NGOs, universities, key stakeholders and developers, the current application of the one-stop-shop principle in Austria should be re-designed and simplified [61,62,74,79,82–84]. This also applies to the evaluation process. It is hard to believe that German administration, with a comparable structure, can evaluate complex EIAs and that the Austrian colleagues cannot. If the argument is that they lack experience with this rarely applied instrument, then a well-trained EIA-agency, such as one in South Tyrol, could be one possible solution. Furthermore, the splitting into two steps, such as in Germany—one for the discussion of alternatives, participatory processes, improvements and general suitability (EIA), and one directly linked to the legally binding regulation of compensation, mitigation, monitoring and other environmental rights—should be discussed. This would also facilitate the consideration of the increasing body of other environmentally relevant European directives including challenges in participation and information (DIRECTIVE 2003/35/EC, DIREKTIVE2003/4/EC see [85,86]).

The very strict and inflexible approach in Austria also contradicts current trends in planning, focusing more on incremental steps. Jay et al. [5] argued that the EIA process, e.g., during the scoping, should be characterized by communicative approaches in which emphasis is placed upon participation and consensus-building, at least in the defined alternatives to be analysed, or in the main problems. Furthermore, Richardson [87] would prefer a participatory approach over expert-led technical solutions.

The special focus on one project type (winter tourism development) may have had an influence on the main findings, e.g., normative effectiveness and pluralism. Therefore, the transferability to other project types is limited. In the future, the presented framework should be applied in the analysis of other project types in the two countries, e.g., applications in the energy sector, in order to see if the described deficiencies remain.

6. Conclusions

Overall, we found the framework on effectiveness to be broadly appropriate and thus useful. The structure of the framework helped to meaningfully reflect on the respective applications in the two countries and to identify strengths and weaknesses. However, in the context of winter tourism development, which is subject to controversial public discussion, the detailed analysis of pluralism did not provide additional insights. Weston [56] argued in this context that the effects of public participation might be overestimated—if the public is already against a project, their fears and opposition often cannot be changed by the provision of expert information compiled and paid for by the developers.

We believe that the focus on transactive effectiveness is an important contribution to achieve the overall goal of the EIA concept, its suitable application and the desired effects on the environment and human health. In this respect, the paper contributes to closing a significant research gap.

The fact that Austria—despite its sensitive environmental conditions in the Alps—has had less EIA processes than Luxemburg, with a much smaller territory, underlines the critical findings of the study at hand and the need for adjustments and significant improvements. The applied framework helps to understand the actual barriers and the context including the political, social, economic and administrative influences.

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