



universität
wien

MASTERARBEIT / MASTER'S THESIS

Titel der Masterarbeit / Title of the Master's Thesis

“Environmental Impact assessment-a-review of concepts and its applications to a railway track in Austria”

Verfasst von / Submitted by
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angestrebter akademischer Grad / in partial fulfilment of the requirements for the degree of
Master of Science (MSc)

Wien, 2018 / Vienna 2018

Studienkennzahl lt. Studienblatt / degree
programme code as it appears on the student
record sheet:

A 066 299

Studienrichtung lt. Studienblatt / degree
programme as it appears on the student record
sheet:

Interdisziplinäres Masterstudium Environmental
Sciences

Betreut von / Supervisor:

Univ.-Prof. Dipl.-Geogr. Dr. Thomas Glade

Acknowledgments

I would like to thank Mr Johannes Kresbach from the Federal Ministry of Sustainability and Tourism, Ms Cyniburk Patrizia from the Austrian Environmental Agency, Thomas Schuh (2) from ÖBB Infrastructure, Flora Maria Brocza and Christoph Niederhauser for their continued support throughout my research process. It is their support that gave me strength to continue working on my project as they were always there when I needed them. Also Professor Thomas Glade for agreeing to work with me and his support as he arranged for me to have a meeting at the Ministry of Sustainability and Tourism and that enabled me to get more information for my project. Last but not least my friends at the Environmental (Geo) Sciences as well as my husband and children. I really appreciate all the efforts, inputs and contributions you gave throughout my whole study program.

TABLE OF CONTENTS

Chapter 1

1. Introduction
 - 1.1. Grouping of environmental impacts
 - 1.2. EIA Processes
 - 1.3. Environmental Impact Statement
 - 1.4. EIA process managers
 - 1.5. Advantages and disadvantages of EIA
 - 1.6. History of environmental impact assessment

Chapter 2

2. The hypothesis, Research question and Methodology
 - 2.1. The hypothesis
 - 2.2 Research question
 - 2.3 Methodology

Chapter 3

3. European Union
 - 3.1. European union EIA
 - 3.2. Espoo Convention
 - 3.3. Procedures of Espoo Convention
 - 3.4. Strategic environmental assessment
 - 3.5. Key features of the Protocol
 - 3.6. Differences between SEA and EIA
 - 3.7. Relationship between SEA and EIA

Chapter 4

4. Austrian EIA
 - 4.1. Austrian environmental impact assessment
 - 4.2. Contents of environmental impact statement in Austria
 - 4.3. Scope for high speed trains
 - 4.4. Initiation of environmental impact assessment

Chapter 5

5. Case study: St. Pölten - Loosdor Freight train bypass St. Pölten (GZU), (**Lückenschluss St. Pölten Loosdor Güterzugumfahrung St. Pölten (GZU), Abschnitt Mitte**)
 - 5.1. Methods
 - 5.2. Project description

- 5.3. Objectives of the project
- 5.4. Project history
- 5.5. Results
- 5.6. Remedial processes of challenges
- 5.7. Outlook

Chapter 6

- 6. Perspective
 - 6.1. International perspective
 - 6.2. Conclusion

References

List of figures and tables

1. Types of impacts	3
2. EIA concept and eight guiding principles	3
3. EIA process management	4
4. EIA process	5
5. Complex EIA	6
6. Reconstructed EIA	7
7. Applying a systematic EIA process	9
8. Demand on EIA process managers	14
9. Realms of environmental impact	19
10. Espoo Convention implementation strategy	29
11. Relationship between steps of SEA process and different tools	31
12. A tied process of environmental assessment	34
13. SEA, EIA and decision making linking and integrating	35
14. SEA, EIA and GIS in planning process	36
15. Austrian concentrated EIA procedure	43
16. Austrian new projects screening procedure	44
17. Austrian modification projects screening procedure	45
18. Project route	48
19. The pond	52
20. The noise barriers	52
21. Tunnel construction	53
22. Landscaping along the railway	53
23. Pummersdorfer tunnel emergency exit	54
24. EIA disclosure and consultation facilitated by EBRD	57

Tables

Table 1.....Facts about mitigation	10
Table 2.....Advantages and disadvantages of EIA	16
Table 3.....Espoo vs SEA	34

List of abbreviations

EIA.....Environmental Impact Assessment

SEA.....Strategic Environmental Assessment

Espoo Convention.....Convention on Environmental Impact Assessment in Transboundary Context

SEA Protocol.....Protocol on Strategic Environmental Assessment in Transboundary Context

EIS.....Environmental Impact Statement

NEPA.....National Environmental Policy Act

NEQA.....National Environmental Quality Act

UNEP.....United Nations Environment Program

CEIATC.....Convention on Environmental Impact Assessment in Transboundary Context

UNECE.....United Nations Economic Commission for Europe

ATCP.....Antarctic Treaty Consultative Party

IEE.....Initial Environmental Evaluations

CEE.....Comprehensive Environmental Evaluations

ATCM.....Antarctic Treaty Consultative Meeting

PPPs.....Policies, Plans and Programs

GIS.....Geographic Information Systems

NGOs.....Non-Governmental Organizations

CO₂.....Carbon dioxide

IFIS.....International Financial Institutions

EBRD.....European Bank for Reconstruction and Development

BIC.....Business Information Center

ICJ.....International Court of Justice

ILC.....International Law Commission

Kurzzusammenfassung

Direktinvestitionen in die Infrastrukturentwicklung, den Bergbau, die Landwirtschaft sowie das verarbeitende Gewerbe machen es erforderlich, die Umwelt vor erheblichen negativen Auswirkungen dieser Entwicklung zu schützen. Die Europäische Union hat den UVP-Gesetzgeber 1988 nach der Verabschiedung der Richtlinie 85/337 / EWG, der Espoo-Konvention, die das Übereinkommen über die grenzüberschreitende Umweltverträglichkeitsprüfung und das Protokoll über die strategische Umweltprüfung ist, entwickelt. Die EU-Richtlinie dient als Grundlage für UVP-Gesetze verschiedener Mitgliedstaaten und fördert die multilateralen und bilateralen Beziehungen zwischen den Mitgliedstaaten. In Österreich wurde 1993 das erste UVP-Gesetz veröffentlicht, das mehrmals geändert wurde, mit der prominenten Änderung von 2000, die zur Nennung des Gesetzes als UVP-Gesetz 2000 führte. Die Arbeit untersucht die Anwendung der UVP auf Infrastrukturentwicklungen genau Speed Rail Projekte in Österreich. Die EIA-Prozesse der Europäischen Union und Österreichs werden anhand von Gesetzen und wissenschaftlicher Literatur untersucht und der Einsatz wird an der Umfahrung St. Pölten - Loosdor Güterzug St. Pölten (GZU) untersucht (Lückenschluss St. Pölten Loosdor Güterzugumfassung St. Pölten (GZU)). Abschnitt Mitte) als Fallbeispiel. Die Fallstudie über den Bau von Hochgeschwindigkeitszügen zeigt eine starke Umsetzung des UVP - Prozesses auf Projektebene, wobei relevante Interessengruppen einbezogen werden und Parteien, die nicht damit zufrieden sind, ihr Recht, die Entwicklung vor Gericht zu bringen, ausüben können Die abteilungsübergreifende Koordination während der verschiedenen Projektphasen war stark. Die Umweltverträglichkeitserklärung des Projekts war von hoher Qualität, es wurden Minderungsmaßnahmen getroffen, und das Projekt stand noch vor einigen Herausforderungen und Fallstricken.

Abstract

Direct investment in infrastructure development, mining, agricultural as well as manufacturing industry makes it necessary to safeguard the environment against significant adverse impacts brought by these developments. The European Union developed the EIA legislature in 1988 after the adoption of Directive 85/337/EEC, Espoo Convention which is the Convention on Transboundary Environmental Impact Assessment and The Protocol on Strategic Environmental Assessment. The European Union Directive serves as the baseline for EIA Acts of different Member States and promotes Multilateral and Bilateral relations between member states. In Austria the first EIA Act was published in 1993 and has been amended several times since then with the prominent amendment being that of 2000 which resulted in the naming of the Act as EIA Act 2000. The Thesis investigates the application of EIA on infrastructure developments, in particular high speed rail projects in Austria. The European Union and Austrian EIA processes are investigated using legal and scientific literature and the application is investigated using the St. Pölten - Loosdor Freight train bypass St. Pölten (GZU), (**Lückenschluss St. Pölten Loosdor Güterzugsumfahrung St. Pölten (GZU), Abschnitt Mitte**) as a case study. The case study, which is the construction of a high speed railway, shows strong implementation of the EIA process at project level with relevant stakeholders being included and parties not satisfied with the process having the opportunity to exercise their right of taking the development to courts of law, the interdepartmental coordination during the different project phases was robust. While the Environmental Impact Statement of the project was of high quality, and mitigation measures were put in place, the project still faced some challenges and pitfalls.

Introduction

1. General information about Environmental Impact Assessment

Environmental Impact Assessment (EIA) can be referred to as the methodical detection and assessment of probable effects of planned developments, rule, policies or statutory activities concurrent to the physical, chemical, biological, cultural and socioeconomic constituents of the overall environment (Mareddy 2017: 1). There are numerous definitions of Environmental Impact Assessment (EIA) in the scientific literature. According to Cashmore (2004: 404) EIA is a resolution tool used to detect, assess and monitor the possible environmental consequences of the planned project on the environment. According to Zubair (2011: 228) EIA identifies, predicts and evaluates the impacts the project will have on the environment, both beneficial and destructive, and proposes mitigating factors to remove or reduce the negative impacts and maximizing the positive impacts.

EIA is a tool to use in integrated of development proposals, policies and programs (Sadar 1996). The role of EIA is to stop or remove possible negative impacts of man-made development by recommending specific mitigation measures which could eliminate adverse effects even before the particular activity can take place (Pavlickova 2015: 74). According to Suwanteep (2016: 12) many countries applied environmental impact assessment at the project level for a number of years and have acquired a good knowledge and experience. The main EIA procedures are the same worldwide however the quality of Environmental impact statement and environmental impact assessment screening differs from country to country.

According to Mareddy (2017: 1) International governments and organizations also have different meanings of EIA. United Nations refers to EIA as a valuation of effects of intended development on the environment while the International Association of Impact Assessment defines EIA as the methodical procedure to detect the impending results of a present anticipated project. According Department of to the Environment United Kingdom, EIA is a method and a procedure by which material about environmental impacts of the development is put together, by both the designer and contractor and from other sources, and taken into consideration by the competent authority in establishing the verdict on whether the project should carry on. United States of America Environmental Protection Agency states EIA as follows: methodical, reproducible and interdisciplinary assessment of probable impacts of planned development and its useful substitutes on physical, biological cultural and socioeconomic aspects of a specific environment. It is however significant to note that all these explanations have common idea of EIA procedure, EIA plays a vital role in designing a project and EIA as practical technique of incorporating environmental concerns. Albrecht (2008: 360) states that Environmental Impact Assessment is a significant instrument to develop the value of data which is made accessible to authorities and decision makers and which lead them to the easy decision making in sight of taking conclusions that decrease antagonistic effects on the environment.

Objectives of EIA

Mareddy (2017: 19) states that the aims and objectives of EIA practice include:

- To ensure that environmental concerns are taken into account planning throughout and they inform decision making and to eventually reach more environmentally friendly and sustainable developments.
- To providing data for acute evaluation of the overall environment so that conclusion can be reached centered on as almost comprehensive and sensible facts probable.
- Affords current immaterial/immeasurable impacts to evaluate and sufficiently taken into account by cost/benefit and other official reports, to make available data to the community on a proposal to validate the concern of substitutes to a proposal being deliberated, so that the less environmentally destructive ways of accomplishing the given objective can be selected, and to enhance the design of new project and protect the environment by the use of alternative and preventative measures.

Glasson, Therivel and Chadwick (1996) list the following as the main objectives of EIA:

- An aid to decision making
- An aid to formulation of development actions
- An instrument for sustainable development

1.1. Grouping of environmental impacts

Environmental effects subsequent from the planned development can be classified into the different groups as shown in fig. 1 below:

- Constructive or negative
- Naturally reparable or irreparable
- Reversible through good management practices or irreversible
- Short term and long term
- Impermanent or incessant
- Happening throughout building phase or working phase
- Resident, provincial, countrywide or international Unintentional or deliberate
- Direct or indirect
- Cumulative or single

Based on the physiognomies these effects can be categorized into three major groups, namely: 1) direct effects which follow complete direct contact of the constituent with the environmental, social and economic factor. 2) indirect effects are those that are not directly coming from the development however their compound effects trail may end up on the project side and 3) cumulative effects encompass the impacts that are produced as an outcome of the permutation of the development assessed in EIA together with other developments producing connected effects. These effects come about when the negative effects of the development are summed up with the accumulative impacts of the previous, current and a realistically probable imminent development (Mareddy 2017:9).

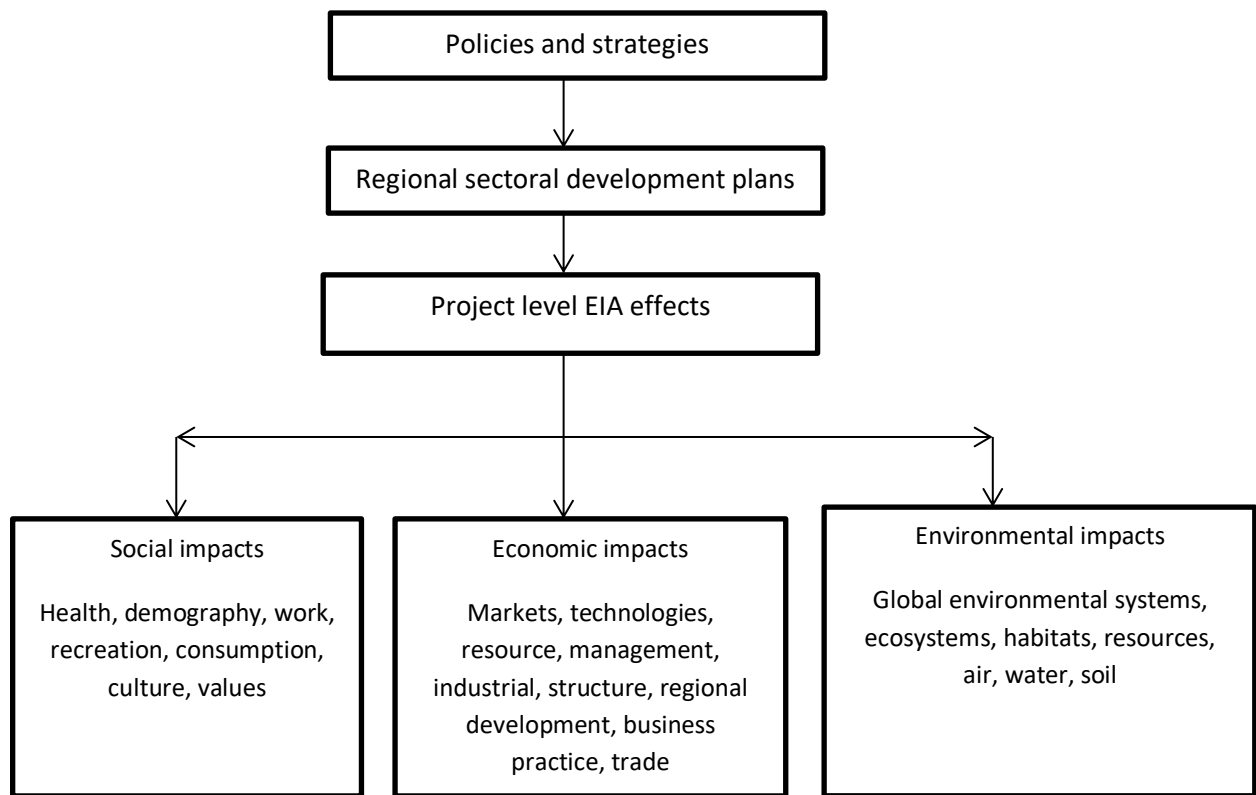


Fig. 1 Types of impacts. Adapted from Mareddy (2017)

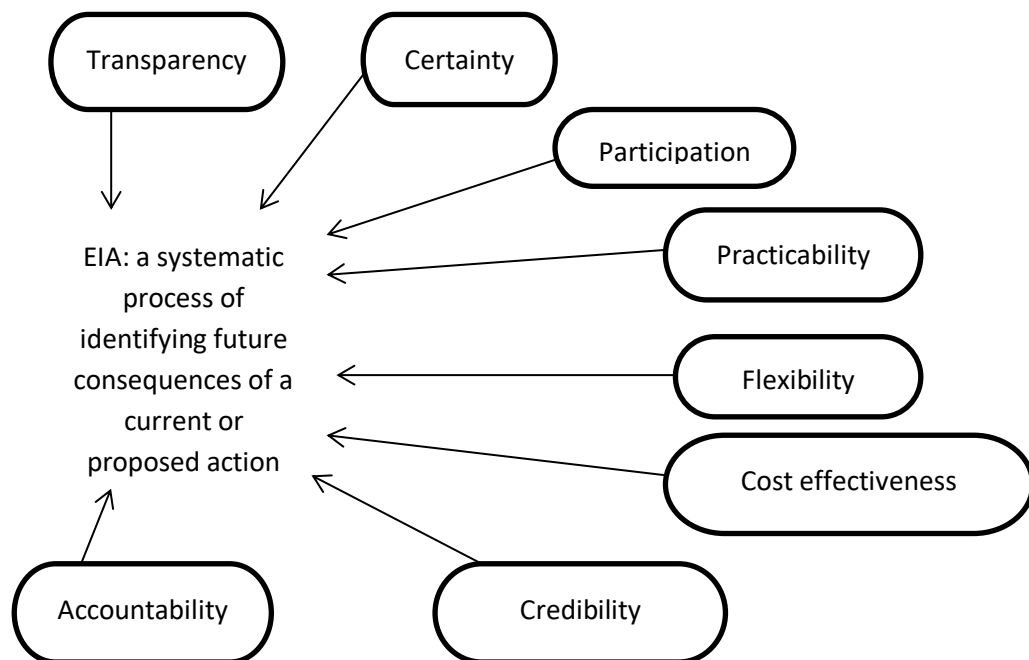


Fig. 2 EIA concept and eight guiding principles. Adapted from Mareddy (2017)

Fig. 2 shows the eight guiding principles that regulate the whole EIA procedure. These principles guarantee that the EIA process is inclusive of all relevant stakeholders, cost effective, accessible and finished on schedule. An appropriately led EIA should have some regulatory values to encourage public involvement, contribution of decision makers and also help in setting the base for environmentally friendly developments and its improvement in the region where such developments can be constructed (Mareddy 2017)

1.2. EIA process

According to Lawrence (2013: 28) conclusions can be reached concerning the suitable actions and action constituents (comprising sets concerning action structure, method, occurrence, period and relations), responses to the development, feedbacks from the development, and relations between the EIA process and decision making and associated events and fields, acclimatizing the practice for the dissimilar plan, exponent, impact and location type and to fit proposal and impact to precise physiognomies and how to construct into process management intuitions and programs from EIA value and efficiency assessment.

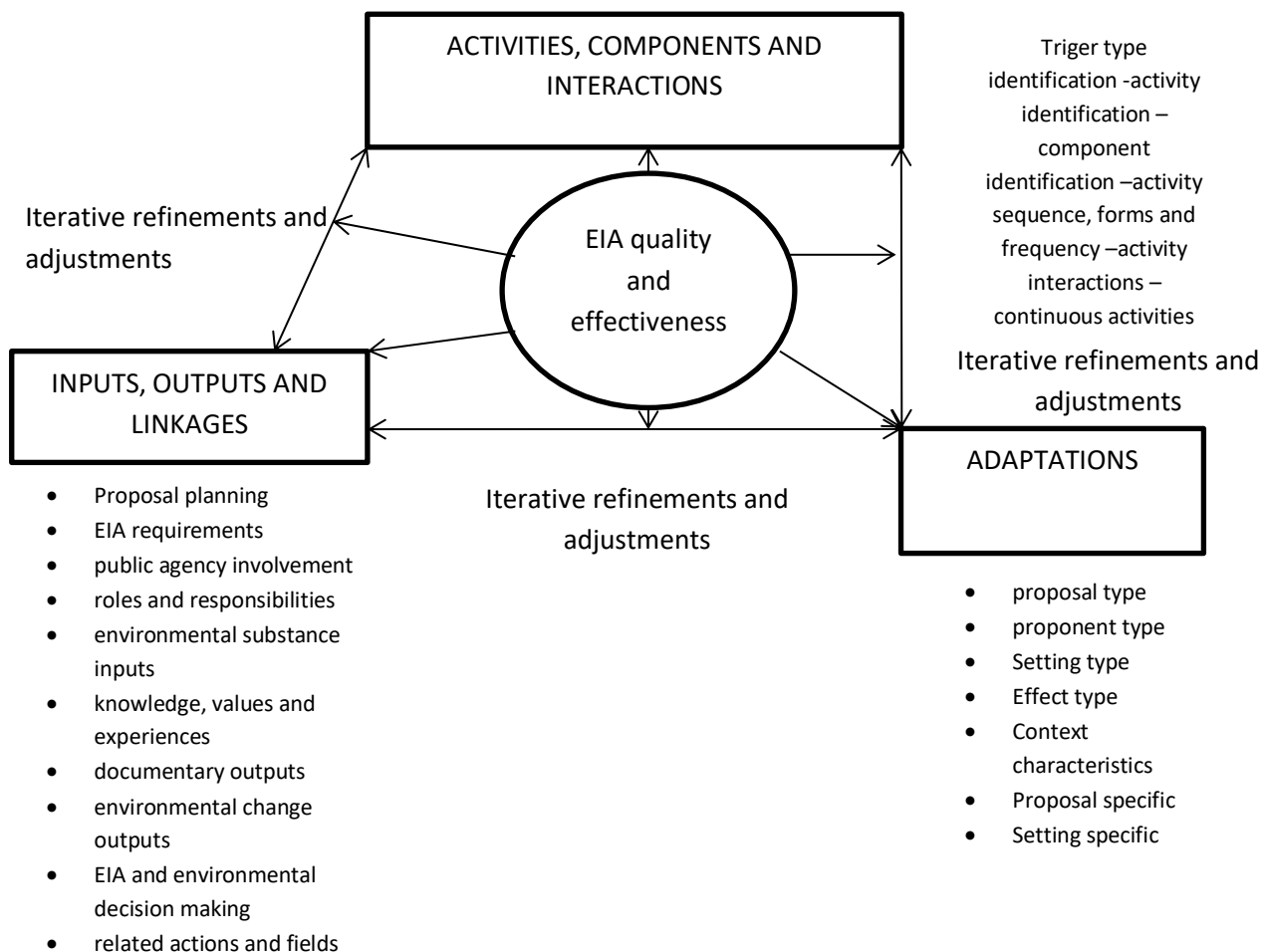


Fig. 3 EIA process management elements: adapted from Lawrence (2013)

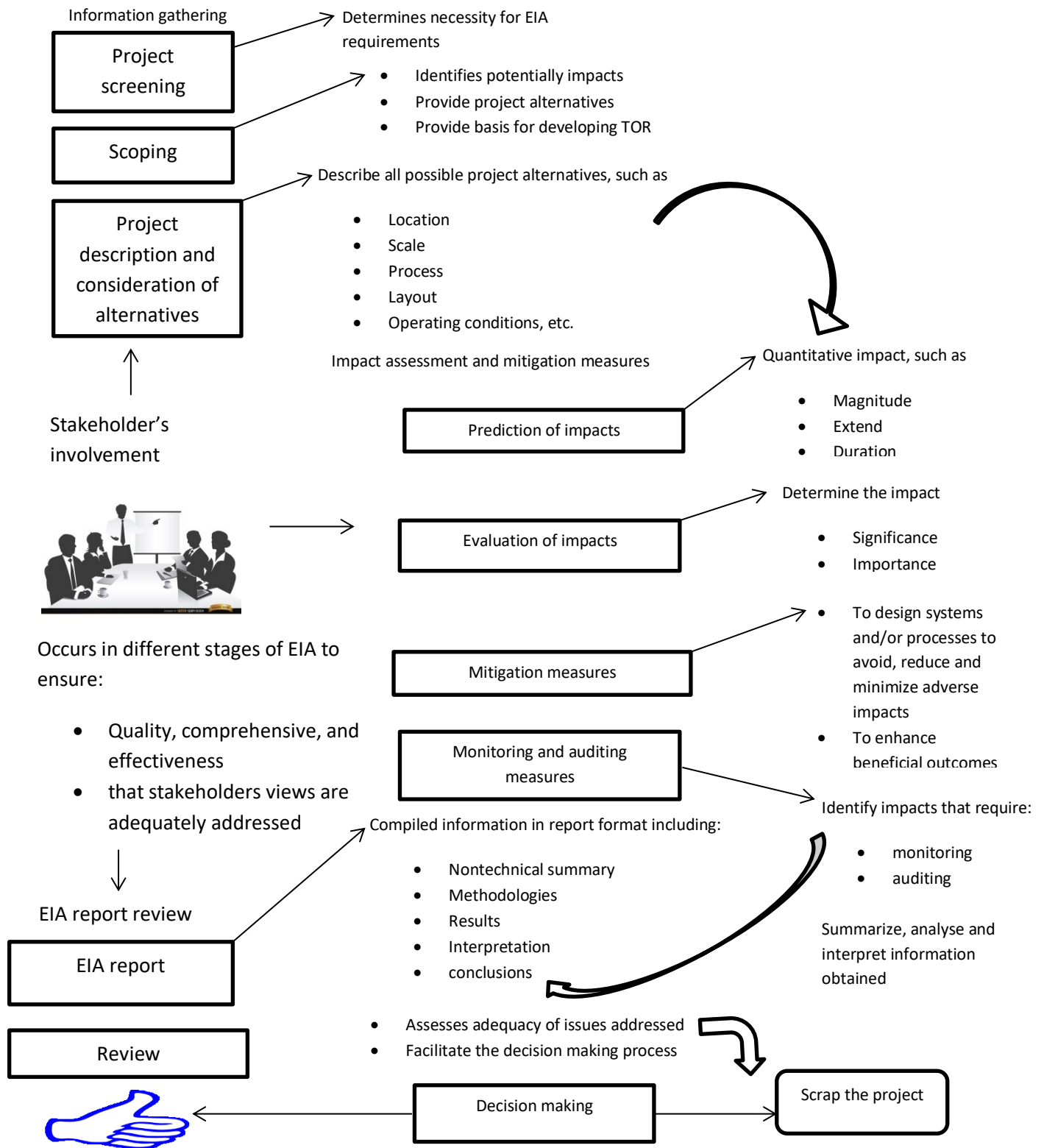


Fig. 4 EIA process: adapted from Mareddy (2017)

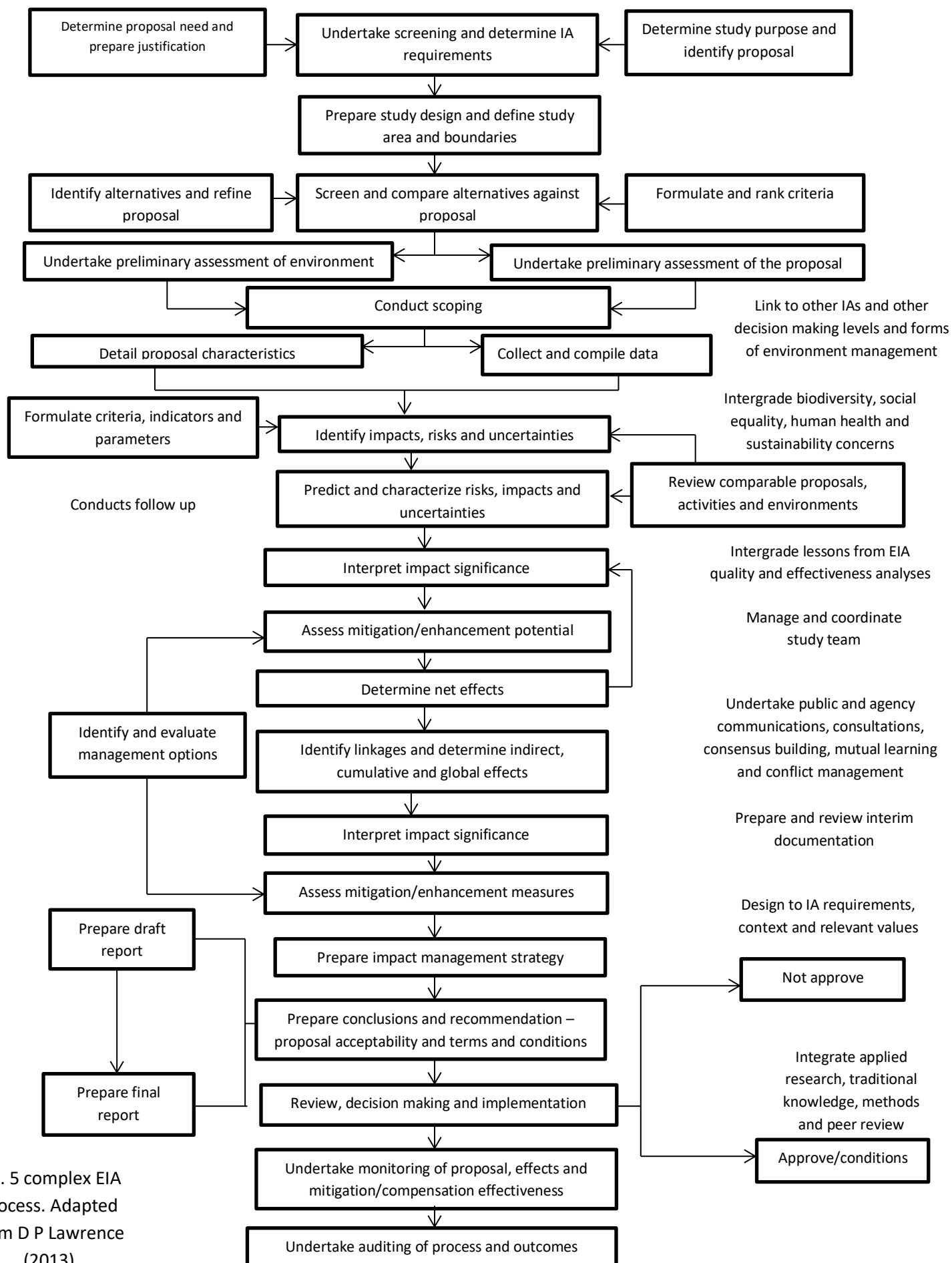


Fig. 5 complex EIA process. Adapted from D P Lawrence (2013)

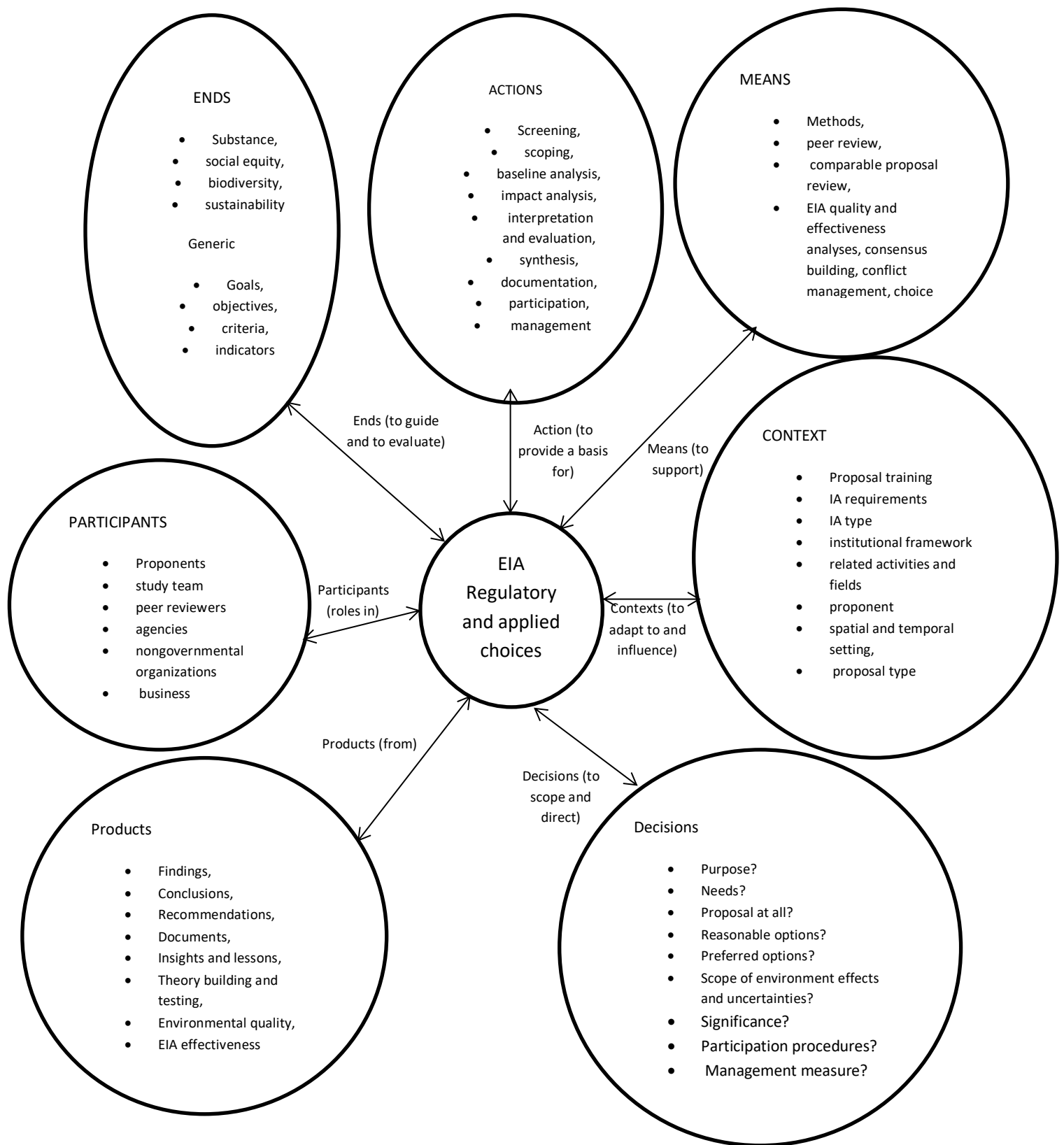


Fig. 6 Reconstructed EIA process. Adapted from D P Lawrence 2013

According to Mareddy (2017) in the EIA systems, there are sequences of activities implemented in project in a logical sequence and they are termed EIA process. Fig. 3 shows the EIA process management elements choices. There are different types of EIA processes internationally as shown in Figs. 4-6. Conclusions can be reached concerning the suitable actions and action mechanisms (as well as selections concerning action structure, method, rate of recurrence, period and linkages), contributions to the procedure, results from the procedure, and interconnections between EIA procedure and decision making and associated application, advocate, impact and location types and to match application and impact precise features, and how to construct into procedure management perceptions and lesson from EIA quality and effectiveness analysis (Lawrence 2013). Fig. 4 shows a most common EIA process that is employed worldwide but steps may be different from state to state based on the type of weather, topography, circumstances, lifestyle of the locals and the economic position of the individual state (Mareddy 2017). Fig.5 shows a more compound EIA procedure while Fig. 6 shows a more inclusive and interactive regulatory EIA procedure (Lawrence 2013).

Steps in process in EIA procedure as stated by (Mareddy 2017)

1. Project screening: not all construction projects need EIA. Project screening will assist to detect those that really do must undergo EIA. The procedure of screening typically includes the appraisal of the development contrary to the specification of development to decide whether an EIA is obligatory condition for a particular project. Frequently there is more or less hesitation, and an environmental specialist may be essential to assist and give guidance on three matters, specifically environmental appraisal, EIA and environmental audit. Environmental appraisal may be explained as, a low level study that emphasizes on specific subjects and environmental inputs to strategic undertakings. Environmental impact assessment may be described as a high level study that comprises interdisciplinary, broad and thorough investigation of the planned project and the environment in the region which it is developed and lastly environmental audit that is comparable in magnitude to EIA, but it's implemented to current developments but not the new developments.
2. Scoping: the technique of scoping facilitates to decision-making the magnitude or scope of EIA.
3. Baseline data collection or pertinent institutional information: relevant data regarding the building and operation of the planned development is collected. These include numerous environmental legislature, directives or programmes or executive orders connected to physical, chemical, biological, and cultural and socio economic environments. Normally any new construction project has negative impacts on the environment, the severity of the effects on the environment rest on their location with regard to the wetlands, agricultural and forest lands.
4. Identification of potential environmental impacts: Fig. 7 shows overall framework for identifying direct, indirect and ultimate impacts of the proposed project. This early qualitative reorganization of expected effects can be advantage in concentrating in the following steps of the project. For example, it can aid in describing the affected environment and subsequent impact calculations. Identification of potential environmental impacts can be an outcome of scoping process. It should include consideration of the generic impacts related to the project type being analysed.

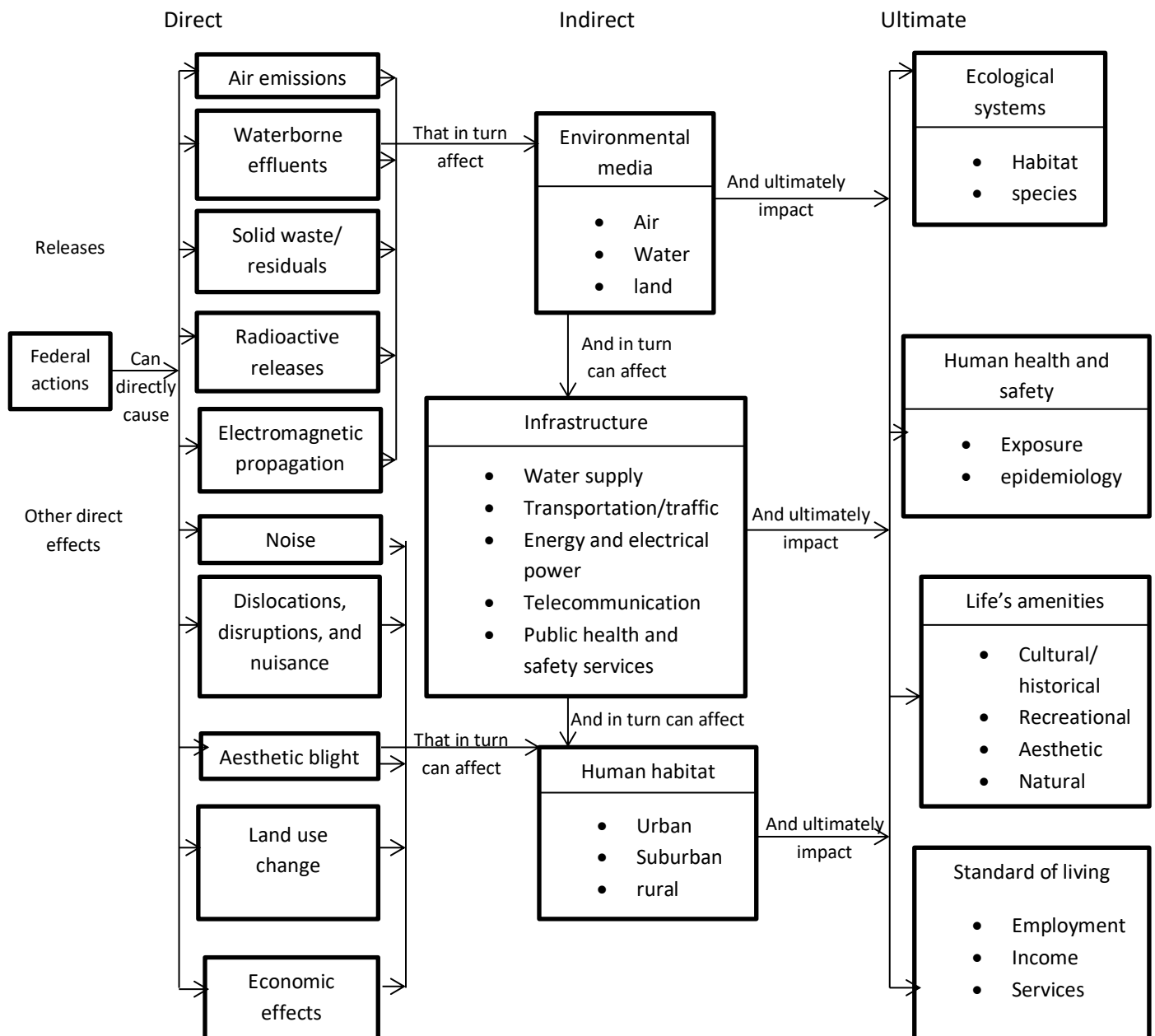


Fig. 7 applying a systematic approach for impact identification: adapted from Mareddy (2017: 40)

- Impact prediction comparison of alternatives and determination of significance: impact prediction discusses to the magnitude and qualitative explanations of the expected effects of the anticipated development on numerous environmental factors. Reliant upon the specific effect, technically challenging mathematical models might be obligatory for effect prediction. Additional methods comprise the conveyance of laboratory testing, such as leachate testing for rummaged material, compacted or harmful unwanted materials and sludge. Impact prediction can also be done by the use of mirror image or equivalent data on real effects from comparable categories of developments in dissimilar or parallel topographical locations. Risk assessment concepts might similarly be valuable in impact prediction. The possible advantage of

implementing the values of risk identification, dose response and exposure assessment, risk interpretation and risk management in EIA include:

- a) The reinforcement of cohesive intelligent such as for environmental transport routes and related health or ecological impacts,
 - b) The opportunity to concentrate responsiveness on risk reduction actions such as waste reduction, contamination avoidance, and mitigation measures,
 - c) The presence of stress on emergency reaction methods in the occurrence of accidents and related environmental agitations.
6. Mitigation measures: impact mitigation is related to impact prediction comparison of alternatives and determination of significance. Mitigation measures comprise of the following:
- a) Evading effects completely by not doing particular activities,
 - b) Decreasing effects by regulating the amount or scale of the activity and its application,
 - c) Remedying the effect by restoring, acclimatizing or repairing the impacted environment,
 - d) Decreasing or eradicating the effect over time by conservation and preservation processes during the construction phase of the project,
 - e) Compensating for the effect by substituting or recognising alternative resources or environments

The aim of mitigation measures is to capitalize on development advantages and reduce detrimental effects, which eventually give way to sustainable development. Table 1 illustrates and afford some fascinating facts of impact mitigation

Table 1 Facts about impact mitigation: Adapted from Mareddy (2017)

Mitigation measures need financial backing	For which application of the planned must be projected and counted in in the EIA report
Mitigation measure must be incorporated in the development proposal	So that these methods may habitually form a part of the building and effective stages of the development
Mitigation measures are not restricted to single stage or level in the EIA procedure	At any time, for the duration of development execution, different types of effects can be recognized and suitable mitigation measures must be suggested for addressing them
Relationship concerning mitigation and monitoring	Mitigation measures are of no significance without being applied, hence, they ought be formulated with monitoring in mind

7. Public consultation and participation: (Glucker 2013: 104) says that at numerous intercontinental consultations following the introduction of EIA, the significance of public participation for environmental decision making has been ceremoniously accepted. He further gave an example of the 1992 Rio Conference on Environment and Development of the United Nations, which says in principle 10 of its Declaration “environmental issues are best handled with the participation of all concerned citizens at the relevant level”. Moreover the 1998 Aarhus Convention which is the Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters is considered a ground-breaking for public participation because it sets out the least requests for public participation in numerous classes of environmental decision making, calls upon signatories to “guarantee the rights of access to information, public participation in decision making and access to justice in environmental matters in accordance with the provisions of this convention ”. According to (Mareddy 2017: 557) public consultation/participation refers to the procedure by which the apprehensions of resident impacted people and others who have credible connection in the environmental impacts of the development or action are given opportunity to take into consideration all the substantial concerns in the development or action strategy as applicable. Public participation is an essential strategy of the EIA process. Well-timed, strategic and properly applied public participation programs play a major role to EIA planning and to the effective design, application, procedure, and administration of proposals. Precisely, public participation is a valued source of data and material on significant effects, possible mitigation measures, and identification and assortment of replacements. It also guarantees that the EIA process is apparent, transparent, and vigorous, characterized by defensible investigation. The fundamental purposes of public participation are to:

- acquire community and indigenous information that may be valuable for executive decision-making;
- assist by paying attention to possible substitutes, mitigation measures, and compromises;
- make sure that significant effects are not disregarded and ignored and benefits are taken full advantage of;
- decrease fight with the communities through the timely establishment of argumentative issues;
- offers an chance for the public to guide and have a say in project planning in a positive manner (thus making the community feel that they own the project and it was not imposed on them);
- Develop transparency and responsibility of decision making by the executives ;
- Intensification public assurance in the EIA process.

People who are involved in the EIA process are normally referred to as Stakeholders are they include:

- Local communities where the project is going to take place
- People who are going to positively or negatively benefit from the project

- Private sector community
- NGOs
- Voluntary organizations/interest groups
- Scientists and experts
- Local and national governments

8. Environmental monitoring: according to (Garel, 2014: 19) Environmental management/monitoring ought to be considered as one of the greatest essential output of EIA with the subsequent overall objectives:

- To afford response and timely cautioning of possible environmental destruction
- To make sure that effects do not go beyond permissible standards
- To take a closer look at the application of mitigation measures

Mareddy (2017: 48) states that Environmental monitoring is mainly essential for bigger projects with possibly substantial impacts that can affect the environment negatively. Environmental motoring could be obligatory in creating standard conditions in the region of the development. Nevertheless, of further significance is longer-term monitoring in the environments of the development to cautiously articulate effects that are essentially taking place and the use of this data in the project administration and supervision. The purpose of environmental monitoring of the 10 step model, are as follows:

- Monitoring strategy of contaminants at where they are produced
- Monitoring contaminants at reception environment for suitable reported constraints, air quality, groundwater, surface water and many more during effective stage of the development
- Precise strategy to observe safety and health security of the employees
- Suitable monitoring system has to be considered and recommended to evaluate the potential outstanding effects on the environment
- Information of internal monitoring proficiencies and the acknowledged organizations if suggested for leading monitoring
- Information on risk assessment and impairment mechanism throughout diverse stages of the development and the recommended safety measure
- Information on socioeconomic improvement undertakings such as assets values, creation of employments, education, social encounters, traditional standings and accidents
- Recommended strategy to handle the socioeconomic effect on the regional community. The strategy ought to comprise measurable proportions as far as possible
- Information of the reparation or reimbursement package for the individuals impacted by the development, bearing in mind the socioeconomic position of the region, home oustees, land oustees and landless laborers. Opinions recognized in the public participation and obligation of the development proponent to the same. Thorough

action strategy addressing the matters raised up and the information of essential allocation funds

9. Environmental Auditing: according to (Evans 2015: 11) environmental audit is a methodical, documented, intervallic and independent assessment by structured bodies of facility processes and practices associated to meeting environmental obligations. Environmental Auditing has three characteristics namely Effectiveness, objectivity/neutrality and transparency says (Cook 2016: 35). Environmental auditing comes after environmental monitoring. It can encompass relating real consequences of the anticipated consequences, and can be used to evaluate the eminence of predictions and the efficiency of mitigation. It affords a significant phase in the EIA learning procedure (Glasson 1996)

1.3. Environmental Impact Statement (EIS)

Environmental Impact Statement is a comprehensive inscribed statement that works as an obligatory means to guarantee that policies and goals well-defined are pervaded into constant programs and activities of the National Government. It must offer complete and impartial dialogue of important environmental effects and must enlighten and notify authorities and local, regional and national communities of the sensible alternatives that would evade or reduce negative effects that more improve the value of the human environment (Mareddy 2017: 14). Furthermore (Glasson, Therivel and Chadwick 1996) states that environmental impact statement affords documentation of the data and give approximations of effects consequent from the different stages in the procedure. EIS discloses numerous substantial inevitable antagonistic effects would offer significant data that might add value or have impact to the rejection or considerable alteration and adaptation of an anticipated project. Where antagonistic effects can be magnificently avoided by the application mitigation measures, there may be a dissimilar conclusion or resolution.

According to Mareddy (2017: 15) a comprehensive environmental impact statement has significant key areas:

- a) Any antagonistic environmental impacts that cannot be eluded should the proposed project be approved
- b) The substitutes to the planned development
- c) The connection concerning confined short term uses of the human environment and the preservation and improvement of long term efficiency
- d) The permanent and irreparable obligations of resources that would be utilized in planned development should be executed

(Glasson Therivel and Chadwick 1996) says that the non-technical summary is a significant component in the project records: EIA can be difficult and the summary can assist to develop communication with the numerous stakeholders participating in the EIA process. Reflecting the possible difficulty of the procedure, a method statement, at the start, offers a chance to clear up some basic data. A summary

Statement of key issues, up front, can also help improve communication and this can also include a monitoring program.

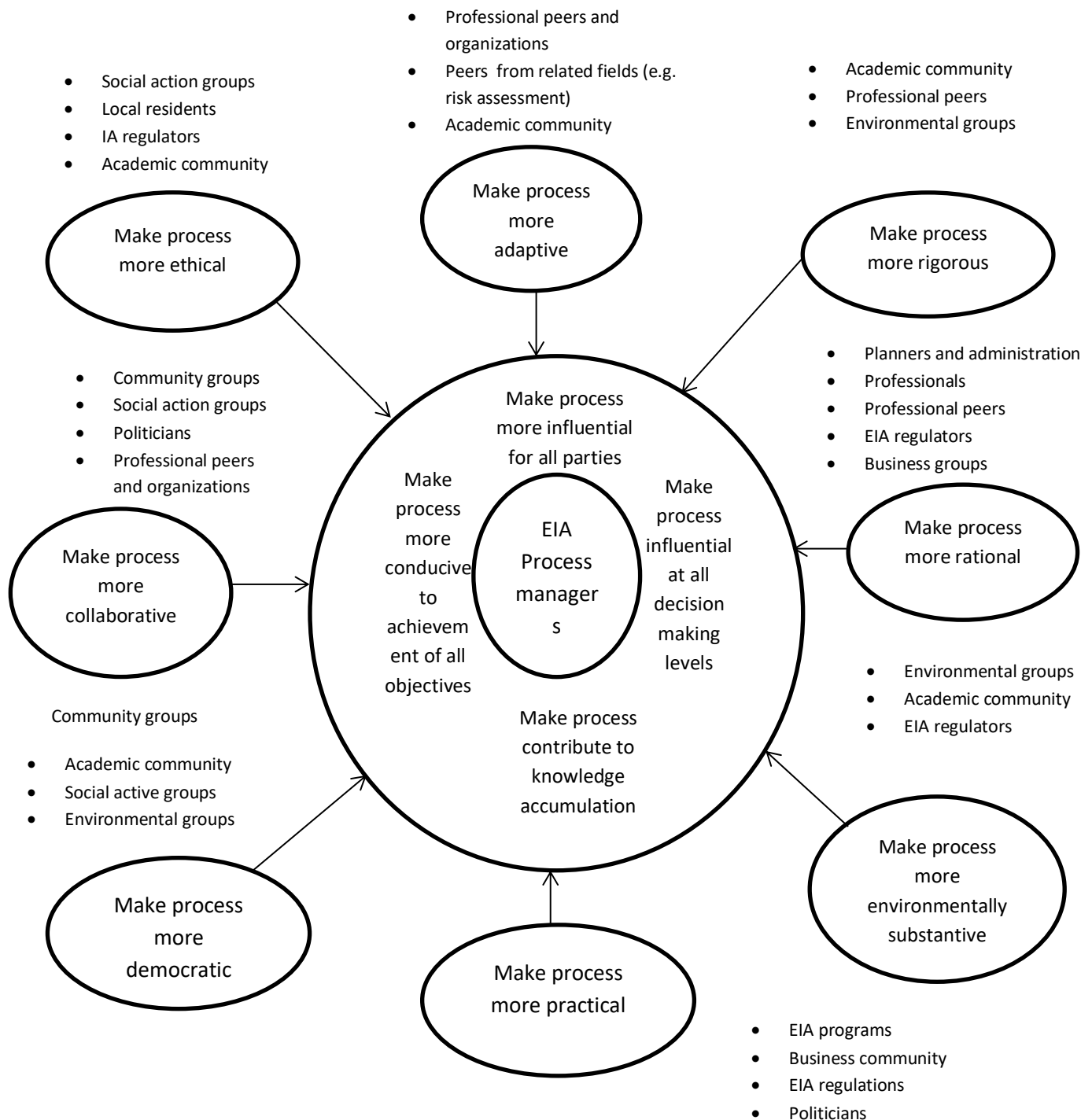


Fig. 8 Demands on EIA process managers: adapted from Lawrence (2013)

1.4. EIA Process managers

The biggest significance for EIA project managers is to make sure that the EIA procedure encourage decision making and is authentic and reliable to all possibly involved and impacted people, to relevant objective, to all decision making stages, and to the accretion of EIA linked information. The successes of the EIA procedure can be rigorously, occasionally seriously, weakened when key participants decide to work separate the EIA procedure. Fig. 8 shows the demand put on EIA process managers. The combination of both strategic and project planning with decision making similarly is significant say (Lawrence 2013: 16). Furthermore (Sadar 1996) states that EIA practitioners need to maintain the state of readiness by:

1. Being fully knowledgeable with the legal process they must follow, including whether or not their project comes under exclusion or inclusion list, class assessment and complete studies
2. Deciding the level of EIA needs to be carried out for their project
3. Recognizing key participants, public interest groups, media and other interested parties involved with the development proposal
4. Developing standard in-house processes to ensure legislative compliance in a reliable and consistent way
5. Budgeting sufficient fiscal and professional resources essential to meet EIA necessities
6. Identifying particular roles and duties of staff with reverence to EIA
7. Allocating skilled staff to deal with all phases of EIA requirements
8. Creating work plans and setting representative goals and objectives
9. Finding and establishing relations with professionals in other sections, organizations and institutions
10. Developing relations and interacting with educational and consulting societies to acquire expert knowledge when it is needed
11. Establishing contact with non-governmental organizations involved in, or apprehensive with the proposal

1.5. Advantages and disadvantages of EIA

According to Mareddy (2017: 13) EIA creates enormous advantage in the choice of development site, procedure, plan, project activities, and decision-making. Nonetheless, in the modern process of EIA, there are some of weaknesses, faults, and insufficiencies. Table 2 shows some advantages and disadvantages of EIA. Single substantial element that may perhaps benefit to develop the EIA procedure is good dissemination of information through outreach programs. Presently, very a small number of informative outreach program and training courses are available in third world nations that accurately study numerous EIA procedures accessible in depth. Data on the permissible and governing frameworks and official provisions are also essential. Learning and teaching procedures are significant since the important issues behind all EIA extrapolations are quiet the best proficient judgment and/or capabilities with comparable developments applied somewhere else. Both correspondence and fulltime courses are essential.

Table 2 the advantages and disadvantages of EIA: adapted from (Mareddy 2017: 14)

Advantages	Disadvantages
Offers methodical approaches of effect valuation Evaluates the price/advantage adjustments of substitute engagements Enables the community involvement Offers actual techniques for • Organization • Environmental incorporation • Consultations/dialog • Feedback Most senior/ highest decision making Prompts institutional structure Accomplish a stability concerning the effect of the project and environmental value	Take a lot time Very expensive Slight community involvement in the actual operation Inaccessibility of dependable information (especially in third world countries) Excessively fixated on scientific exploration (not always) Bad arrangement of EIA (EIS) report (huge sizes, technical descriptions, hard to comprehend) Obedience monitoring subsequent to EIA is occasionally conducted

According to Wayakone (2012: 1663) the EIA structure has some benefits and flaws, but the difficulties in third world nations are frequently further critical by nature of the limitations of professional expertise and financial and governmental stresses facing these nations, as well as by the essential restrictions in comprehensive processes and regulation. There are clear cracks between guiding principle and application, and between EIA processes and EIA exercise. Probable techniques advancements need to reflect both the official basis and role of specific stakeholders, and the EIA process itself. In developing countries, the harmonization between EIA advocates, professionals, applicable government departments, local governments and municipalities, engineers and designers, and decision-makers is relatively fragile. This is leading not only to insufficiencies in scoping, in effect valuation, and in concern of the apprehensive ministry, opinions in EIA documentations, but also to the beginning of construction projects prior to the issuing of the EIA permit. Furthermore deficiency of direction not only causes postponement in executive reaching consensus, but also obstructs the actual application of environmental rules. Consequently, most deficits in EIA structures can be accredited to the bad presentation of groundwork processes (accessibility of strategies, EIA method application observations, relatively fragile homegrown proficiency, and insufficient dissemination of information and aptitude constructing inventiveness). These processes, by description, oblige to encourage decent processes and strengthen the effective implementation of general methodologies. Therefore, their lack or deprived value will adversely impact the efficiency and strength of EIA application and processes in developing countries.

(Vanderhaegen 2005: 124) states that in 2002, the European Commission has made a report on the implementation and efficiency of Directive 97/11/EC. This report is centered on data collected

subsequent a questionnaire assessment of the Parties and has been adopted the 23rd of June 2003. It scrutinizes vital features of the process of the EIA Directive comprising the screening, scoping, and contemplation of substitutes, public involvement and contribution, quality regulation, evaluation and decision making. The data collected in the 5 years report discovered numerous inadequacies and flaws. Some study has been done and concluded in about half of the Parties on the excellence of data written in environmental statements and on the general value of the valuations. Where such research has been done, it has shown that up to half of the environmental impact assessments do not completely meet the obligations of the Directive. Additionally, the report discovered that in some Parties the concern of substitutes seems not to be comprehensive enough. Other significant discoveries of the study are that natural and scientific threats are dealt in an extensive selection of techniques and at very dissimilar stages through the European Union, and that the valuation of effects on health is a feeble feature. Certainly, there is a significant difference in exposure from a constricted to a comprehensive understanding of health impacts. Furthermore, the deficiency of central observation of the vital phases of EIA makes it challenging for Parties to make sure that their EIA methods are constantly and properly implemented.

1.6. History of Environmental Impact Assessment

Extensive engineering or groundworks developments often pose substantial environmental impacts which are typically not restricted to the confined scale. These are found by the application of an environmental impact assessment (EIA) which is an instrument for safeguarding that the possible substantial impacts of a development on the environment are clearly defined and taken into consideration before deciding on whether the anticipated development would continue or not (Albrecht 2008: 360). Several construction developments in the previous years were planned and built in seclusion from without paying any attention to their effects on the environment and the consequences were higher costs, failure of projects, substantial environmental transformation and destructive social impacts (Mareddy 2017: 2). EIA is applied to a wide range of projects including infrastructure, mining, agriculture, energy, industries, waste management, water management and forestry management.

The first formal EIA system was developed by US National Environmental Policy Act (NEPA) in January 1970. This regulation was applied mainly as a political reaction to such issues as the varying scale and nature of manufacturing industry growth after the second World War, increasing community concerns about the environmental consequences of trade and industry as well as financial development, and the disappointment of current decision making tools (especially Cost Benefit Analysis) to effectively address these disquiets (Cashmore 2004: 404), in China EIA was introduced at the end of 1970s with the aim of securing environmental protection and economic development (Liu 2015: 46), in East and Southeast Asia it was born in the early 1980s (Suwanteep 2016: 12) and it was introduced in the European Union in July 1988 (Barker 1999: 387). Thailand implemented the EIA after the revision of the enhancement and conservation of National Environmental Quality Act (NEQA) (Suwanteep 2016: 12). (Jay 2007: 287) EIA needs interconnected methodology, the documentation and publication of EIA report stating probable significant effects in detail. Consultation with local authorities and public involvement are significant to EIA process evaluation.

According to Glucker (2013: 104) the United States NEPA did not only recommend and start the process of environmental impact assessment but also implanted in the procedure of EIA the idea of public involvement. The idea of public involvement in the EIA process has since been recognised internationally. (O'Faircheallaigh 2010: 19) states that the significance of public involvement has been noticeably defined in both theoretical and practical terms; nevertheless the strategy and application of precise public involvement programs continue to be argumentative. (Igondova 2016: 43) says that when looking for possible environmental effects consultants need to be concentrate on the subsequent elements: people should focus on population, human health, biodiversity, soil, water, air, climate change, material assets, cultural heritage and the land scape. (Bastmeijer and Koivurova 2008) says that internationally the major breakthrough came in 1972 at the United Nations Conference on Human Environment held in Stockholm which embraced a declaration that included a principle that it is the accountability of States to reverence the Environment of other states. Additionally (Albergaria 2006: 615) says that deliberations regarding environmental impacts through country boundaries were initially emphasized in the Stockholm Declaration 1972 in which the members to the party obliged themselves to protecting other states environments. Some of these values and ideologies were further stressed in the Bruntland Report (1987). This steered to the development of representation of numerous intercontinental treaties, resolutions and conventions on transboundary impacts, several of which were tightened as an outcome of the United Nations Conference on Environment and Development (1992) and one of the unique of the products was the Espoo Convention on Transboundary Environmental Impact Assessment of the European Union which was signed by 29 member states in 1991. (Hilden 2001:538) says that in the US, the Executive Order 12114 obligating environmental impact statement (EIS) to be produced for every key federal project that could have adverse impact on the environment of neighbouring countries other than the US space, had been issued in 1979, and in Canada, procedures on transboundary assessments were given in 1983. Transboundary matters similarly were introduced and included in the North American agreement on Environmental Cooperation, which entered into force on January 1, 1994 and which is a side agreement to the NAFTA agreement. This also inspired the European Union to form its own transboundary environmental impact assessment agreement. This process was facilitated by the United Nations through UNEP. Furthermore ideologies of transboundary EIA that were produced at a UNEP professional's group consultation on international law in 1987 also had a significant impact on the contents of the Convention.

Globally EIA is needed because key development projects can comprise substantial requirements for connected infrastructure groundworks such as townships, roads, highways, railroads, water supply, sanitary sewers, storm-water drainage, erosion control, sediment control and grading, electric systems, gas systems, educational services, and health services. The establishment of such necessary infrastructures can also produce environmental effects. Planning components and values for these infrastructure requirements and existing guiding principle and strategies can be used for effects interpretation. Furthermore, socioeconomic effects may be a significant disquiet associated to the cumulative effects of a proposed development or activity (Mareddy 2017). Figure 9 affords illustrations of significant socioeconomic constituents and related issues. EIA scrutinizes these significant socioeconomic mechanisms in advance before determining whether and how these important socioeconomic constituents may relate with the components of a proposed project.

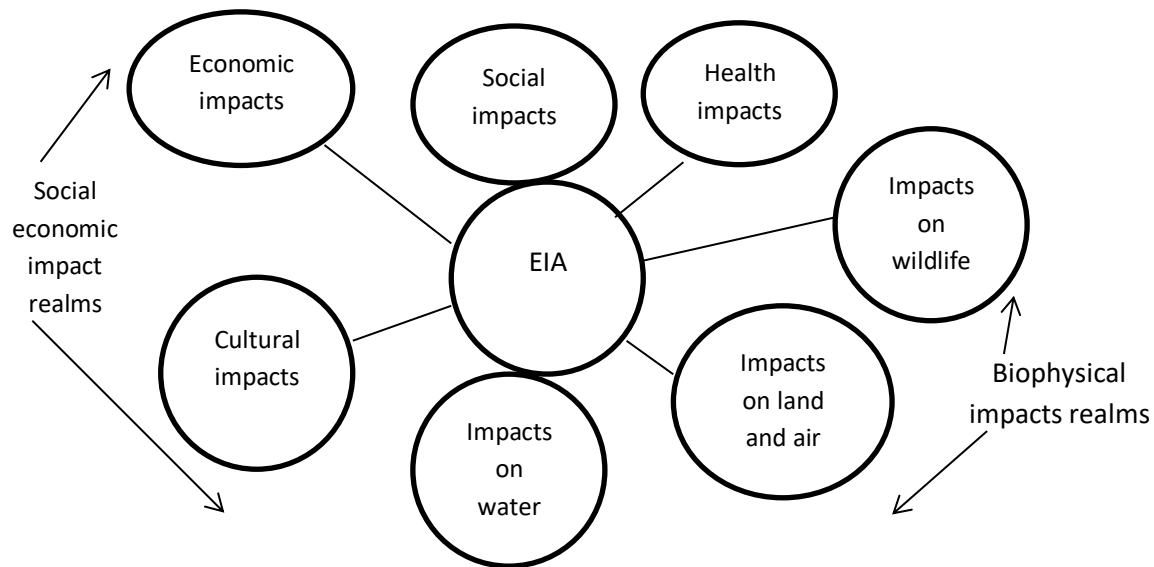


Fig. 9 Realms of environmental impact

(Wenning (2017: 969) says that big scale development projects, infrastructure development and resource development projects have the ability to significantly destroy the environment either temporarily or permanently and the impacted ecosystems might struggle to recover. Moreover altered ecological systems might not be suitable for populations impacted by the destruction of their habitat as they might not be resilient enough to survive the Turbations. Mitigation measure to significant impacts can also be found and be put in place during the project implementation phase. This as a result can minimize the impact of the said development on the environment. Cultural and heritage sites or any site that the communities have a special relationship with in different countries have a better chance of being protected and not destroyed in the in the process when EIA processes are followed especially public participation.

Research question, the hypothesis and the methodology

2.1. The Hypothesis

- a) Infrastructure projects are subjected to EIA as per European Union Directive and Federal Government EIA Act 2000
- b) The Desire for Sustainable development has caused the European Union to develop EIA legislature as the tool sustainable development in the Region
- c) Desire for long term Environmental management has led the Austrian Federal Government to introduce the EIA as a tool for environmental management on major construction works

2.2. Research question

- a) Is Austria following Environmental Impact Assessment process in infrastructure projects as contained in the European Union Directive on Environmental Impact Assessment?
- b) Is EIA used as a tool for sustainable development in European Union?
- c) Is EIA used as a tool for Environmental management in Austria?

2.3. The Methodology

With reference to The Hypothesis developed scientific literature and the material obtained from the Austrian Federal Ministry of Sustainability and Tourism will be used to establish whether Austria had EIA legislature before it introduced in the European Union, as well as the basis of the European Union Directive on EIA so that the hypothesis can verified or falsified. Equally important the Austrian Federal government EIA act, the information obtained from the Federal ministry of Sustainability and Tourism, responses to the questionnaires distributed at the ÖBB Infrastructure, as well as the project EIS will be used to establish whether EIA is used as a tool for sustainable development and long term environmental management tool in Austria, consequently the hypothesis will be verified or falsified

Step 1

Research will be conducted to look into the European Union EIA legislation using the EIA Directive, scientific and law literature. This will include looking at the processes involved in the application at the project level. I will also look at the SEA Protocol of the European Union as it a significant tool used in identifying a suitable project and where it can be implemented.

Step 2

Research will be conducted to look into the EIA processes in Austria using the Material from the Austrian Ministry of Sustainability and Tourism as well as the information obtained when conducting the interviews at the Ministry. Scientific and law literature will also be used

Step 3

The applications of EIA on a big scale project of St. Pölten - Loosdor Freight trains bypass St. Pölten (GZU), (Lückenschluss St. Pölten Loosdor Güterzugsumfahrung St. Pölten (GZU), Abschnitt Mitte) specifically looking at the processes they followed before the project began, during the project phase and after the completion of the project. The Pitfalls, challenges encountered will also be established and concepts they used with the help of the questionnaires and the EIS of the project.

Step 4

The data will be analysed by looking at the processes required by the law and relate those processes applied at St. Pölten - Loosdor Freight trains bypass St. Pölten (GZU). The processes followed at the project level will then be related back to the Austrian processes and then relate them back to the European Union EIA processes.

Results

The pitfalls and challenges of environmental impact assessment that have been encountered at the project level in Austria will be highlighted. Furthermore the EIA application processes in the construction of St. Pölten - Loosdor Freight trains bypass St. Pölten (GZU), (Lückenschluss St. Pölten Loosdor Güterzugsumfahrung St. Pölten (GZU), and Abschnitt Mitte) will be looked at. The hypothesis will then be verified or falsified.

Perspective

Research will be conducted looking at whether the European Union EIA has had significant impact on other corporations dealing with construction either directly or indirectly.

Objectives of the research

The main objective of the research is to look at whether Austria has EIA legislature as it's obligated by European Union as the Member state as well as looking if the processes are followed accordingly when applied to big scale new and modifications infrastructure development projects.

3.1. European Union Environmental Impact Assessment

EIA is presented as a method to expand the level of understanding for decision-making through a procedure of data gathering connected to the identification, extrapolation and valuation of the impacts of development application. In modern years the part played by EIA has been stretched to become progressively essential to environmental development and resource decision-making, somewhat than acting merely as a check upon projects. EIA procedures should provide decision makers with a hint of the probable significances of their actions. EIA can also be perceived as a supervision instrument, which is implemented in a political framework where conclusions of decisions are frequently reached through an enduring procedure that encompasses trade-offs concessions and interested party communications. This relates to each decision-making phase and may also contribute to the fundamentally variable techniques of transposing the EIA Directive's obligations into the European Union member's conventions and protocols say (Mayer (IMP) 3). According to (Barker 1999: 387) EIA was formalized in the European Union in July 1988, after the adoption of Directive 85/337/EEC by the European Council of Ministers in June 1985. Moreover the Directive makes it obligatory for all the projects named in Annex I to be under go EIA process before they can be given the approval permit by the relevant authorities. The Directive stipulates the information that the developer has to provide in Environmental Impact Statement and prohibits the responsible authority to give the approval until discussion with relevant stakeholders and public participation has taken place.

(Directive 2011/92/EU: 2) states that Directive 85/337/EEC has been amended on numerous occasions. It further states that the polluter should be held responsible for the damage caused to the environment as well as facing punishment for their consequences like compensation. The Directive also says that parties to the European Union could fix thresholds that are tougher than the ones outlined by the Directive but should never be lower than them. Significantly the Directive say that European Union the Convention on Environmental Impact Assessment in Transboundary Context on 25 February 1991 and was ratified on 24 June 1997 as well as the UN/ECE Convention on Access to Information, Public participation in decision-making and Access to Justice in Environmental Matters named Aarhus Convention in June 25 1998 and ratified it on 25 February 2005. Article 1(1) of the Directive states that, the Directive will relate to the evaluation of the environmental impacts of those public and private projects which are probable to have substantial impacts on the environment. Article 2(1) of the Directive says that Parties to the European Union will implement the processes essential to guarantee that, prior to issuing project approval, developments probable to have major impacts on the environment by feature, inter alia, size or location are completed subject to a condition for project approval and valuation with respect to their impacts on the environment. Article 3(1) of the Directive states that EIA will recognize, define and evaluate in a suitable way, in the light of each specific instance, the direct and indirect substantial impacts of a development on the subsequent issues:

1. Inhabitants and human health
2. Biodiversity, with specific consideration to species and environments protected under Directive 92/43/EC which is the Directive on the Conservation of Natural habitats and of

Fauna and Flora signed in May 21 1992, and Directive 2009/147/EC which is the Directive on Conservation of Wild birds signed in November 30 2009.

3. Land, soil, water, air and climate
4. Tangible resources, cultural heritage and countryside
5. The relationship concerning the issues mentioned from (1) to (4)

Article 4(1) (2) states that projects listed in Annex 1 and Annex 4 will be made susceptible to EIA using a) case by case evaluation or b) or threshold. Article 5(1) says where EIA is mandatory; the developer will formulate Environmental Impact Statement Report that will contain the following material:

1. A narrative of the development including data of the location, plan, magnitude and other significant structures of the development
2. A narrative of the probable substantial impacts of the development on the environment
3. A narrative of the structures of the development and/or methods envisioned imperative to elude, inhibit or decrease and, if possible, compensate probable important negative impacts on the environment
4. A narrative of the practical options premeditated by the developer, which are related to the development and its precise features, and suggestions of the key details for the preferred decision, taking into account the impacts of the development on the environment
5. A non-technical instantaneous of the data mentioned from (1) to (4)
6. Any supplementary data stated in Annex IV applicable to the precise features of a specific development or nature of development and to the environmental structures probable to be impacted

Additionally Article 5(3) says the developer must guarantee the comprehensiveness and eminence of EIA report:

1. The developer will make sure that the Environmental Impact Statement is written by experienced professionals
2. The experienced specialist will make sure that it has, or has access as required to, adequate professionals to scrutinize the Environmental Impact Assessment report
3. Where essential, the capable professional will try to find from the developer additional data, in relation with Annex IV, which is directly applicable to attainment of the consistent decision on the important impacts of the development on the environment

Article 6 (2) of the Directive says that in order to guarantee the active involvement of the community affected in the decision-making processes, the community should be informed by e-mail and by community communications or by other suitable means, of the subsequent matters on time in the environment decision-making processes referred to in Article 2(2):

1. The permission for project consensus
2. The fact that the development is need to undergo environmental impact assessment process and, where applicable, the fact that Article 7 applies

3. Information of the capable professionals in charge of making the conclusion, those from which applicable material can be acquired, those to which remarks or queries can be directed to, and information of the timetable for communicating remarks or enquiries
4. The nature of potential conclusions or, where there is one, the temporary resolution
5. An hint of the accessibility of the data collected pursuant to Article 5
6. An hint of the periods and locations at which, and the resources by which, the applicable data will be made accessible
7. Information of the provisions for community involvement made pursuant to paragraph 5 of Article 6(2)

Article 6(3) says Parties to the European Union will make sure that, within sensible period, the following is made accessible to the community affected:

1. Any data collected pursuant to Article 5
2. In agreement with domestic regulation, the key reports and information distributed to the experienced consultant or consultants at the time when the community affected is told in agreement with paragraph 2 of this article
3. In relation with the requirements of Directive 2003/4/EC of the European Parliament and of the council of 28 January 2003 on the public access to environmental information ⁽¹⁾, data other than mentioned to in paragraph 2 of this article which is applicable for the conclusion in agreement with Article 8 of this Directive and which only becomes accessible subsequent to the period the community affected was conversant in relation with paragraph 2 of this article

Article 7(1) says that where parties to the European Union can see that a development is probable to have substantial impact on the environment in additional parties in whose land the development is anticipated to take place will inform the impacted party urgently and no later than when notifying its own community inter alia:

1. A narrative of the development, together with any obtainable material on its potential transboundary impact
2. Data on the nature of the conclusion which might be engaged

The Party in whose country the development is planned to be implemented will give the other Party a realistic period in which to specify whether it desires to take part in the environmental decision making processes referred to in Article 2(2), and could comprise the material mentioned to in paragraph 2 of this Article. Article 8 states that the outcomes of discussions and data collected pursuant to Article 5 to 7 will be accordingly considered in the project approval processes. Article 9 says when a conclusion has been reached to approve or disapprove the project consensus has been taken, the relevant expert or experts will quickly notify the community and the professionals mentioned to in Article 6(1) thereof, in agreement with the state processes, and will make sure that the subsequent data is accessible to the community and to the professionals mentioned to in Article 6(1), taking into account, where applicable the cases stated in Article 8a (3):

1. The content of the choice and any circumstances attached thereto as stated to in Article 8a (1) and (2)
2. The key details and deliberations on which the results are centred, together with material about the community contribution procedure. This also comprises the summary of the outcomes of the discussions and the data collected pursuant to Articles 5 and 7 and how those outcomes have been integrated or otherwise addressed, specifically the remarks obtained from the impacted foreign parties stated to in Article 7

Article 9a of the Directive further states that Parties shall guarantee that the relevant establishments implement the responsibilities coming from the Directive in an independent way and do not discover themselves in a position causing the conflict of interest. It continues to say where the relevant expert is also the developer; Parties shall at least device, inside their government of managerial capabilities, a suitable separation amongst contradictory roles when executing the responsibilities coming from the Directive.

(Lister 1996) says that environmental impact assessment was to be done for both private and public proposed projects. Moreover it was mandatory to share the information accumulated for the impact assessment with the members of the public and the public was required to give their outlook about the project before the project start. Equally important the Directive states that where the consequences of the project were to impact more than individual member state the assessment procedure was to be harmonized amongst the member states and the data was to be made public in the affected states. This cooperation between countries was later termed Transboundary Environmental Impact Assessment (TEIA), globally. According to (Bozhesku 2014: 81) Transboundary TEIA, looks at environmental and socio economic impacts of scheduled projects extending outside domestic boundaries. However beneficial model it is frequently inhibited by variances in legislature, authorities and environmental assessment and planning practices of bordering countries. Transboundary Environment Impact Assessment was often employed in the European Union before the adoption of the Espoo Convention in February 2001.

3.2. Espoo Convention

(Bastmeijer and Koivurova 2008) states that Convention on Environmental Impact Assessment in a Transboundary Context (CEIATC) later renamed Espoo Convention backs environmentally comprehensive and sustainable development giving evidence on the interrelationship concerning definite economic activities and their environmental impact specifically in a transboundary context. Espoo Convention explained under the umbrella of the United Nations Economic Commission for Europe (UNECE) was adopted in Espoo Finland in February 25 1991 and came into force in September 10 1997. (Boyle 2011) says that the Espoo Convention defines environmental impact assessment as a technique for assessing the possible influence of a scheduled project on the environment. Furthermore Espoo Convention is one of the primary Multilateral Treaties to stipulate the bureaucratic rights and obligations of parties with respect to Transboundary impacts of anticipated activities and to afford techniques in a transboundary context for the contemplation of environmental impacts in decision making. (Ebbesson 2011: 249) says that Espoo Convention has a relatively restricted emphasis of implementation, and is custom-made for EIAs in transboundary contexts, and undertakings with

potential substantial hostile transboundary environmental effect. The obligation of the Espoo Convention members is to institute environmental impact assessments, so as to 'inhibit, decrease and regulate substantial antagonistic transboundary environmental impact from planned actions, comprises of processes that allow public contribution and involvement. In diverse ways, this responsibility involves both the country that the development is taking place and all the countries that will be impacted by the development; and it also forces them to work together. (Koyano 2008: 229) states that this convention aims at avoiding, decreasing and regulating substantial antagonistic transboundary environmental impact from anticipated developments by institutionalizing a homogeneous procedure of TEIA. This affords for a solid background of technical and practical legislation, which possibly will counterbalance some of the parameters of considerable regulation, regarding environmentally destructive developments. According to (Marsden 2009: 440) the objectives of Espoo Convention are:

- Guarantee environmentally comprehensive and sustainable innovation
- Improve international collaboration between the member states

According to (Koyano 2008: 300) Espoo Convention has some key features and these include:

1. Procedural character in its subject matter

- The substance of the Espoo Convention is technical and practical in character. The purpose to create planned development matter to homogeneous procedure of transboundary EIA somewhat significantly regulating anticipated development. Therefore, the convention is exclusively apprehensive with the technical and practical legality, not the constituent, of planned development.

2. Provision of obligation with specified content

- There are devices for inhibiting the country of origin from creating subjective or unfortunate resolutions as to whether the anticipated development at hand has to undergo the transboundary EIA or not. They include:
 - a) A list of undertakings that can undergo the EIA process (App. I)
 - b) Depiction of broad principles to help in the determination of the environmental implication of the development (App. III);
 - c) Obligation of the involved countries to interchange data for having consultations on whether there is expected to be a substantial antagonistic transboundary impact at the demand of the impacted country (Art. 3(7));
 - d) Tendering of the query to an review or investigations commission to recommend on the possibility of substantial antagonistic transboundary effects (Art. 3(7) and App. IV);
 - e) Establishment of disagreements settlement with probability of arbitration (Art. 15 and App. VII).

3. Requirement for providing for public participation

- Under the Espoo Convention, the Member States are especially obligated to guarantee public involvement in the procedure of transboundary EIA. This may be done in three steps regarding planned development, such as notification (Art. 3(8)), provision of EIA paperwork (Art. 4(2)), and the absolute conclusion (Art. 6(1)). Welfare of the

Communities are here clearly recognized even though each Member State has comprehensive preference how to apply these requirements.

4. Institutionalization of mechanisms for ensuring effective implementation

- Numerous mechanisms for safeguarding real application are presented by the Espoo Convention. Amongst them two mechanisms should be prominent as significant components of the convention. They are: inquiry procedure (Art. 3(7) and App. IV) and review of compliance (Art.14 bis).

5. Multilateral agreement of bilaterally structured procedures

- The Espoo Convention multilaterally homogenizes a bilaterally designed procedure of transboundary EIA, that is, a procedure assumed between two Member States (a country of origin and an impacted country) in a certain occasion, whose welfares are typically are different regarding the development at hand. In other words, concerned Member States are required to homogenize such a bilateral procedure relative with all other concerned Member States. The shared interest in such harmonization amongst all concerned Member States to the convention is mirrored in the multilateral organization of a mechanism of the evaluation of obedience.

3.3. Procedures of ESPOO Convention

(Marsden 2011: 269) states that the processes of the Espoo Convention are organized around requirements in relation to the 'country of origin' and 'impacted country' when applications for projects with probable transboundary effects are reflected. Requirements for announcements, reportage, discussion, involvement and decision making are vital measures of the process. (Bastmeijer and Koivurova 2008) states that if a project named in Annex I and is expected to have substantial antagonistic impacts out of the country the convention procedure must be followed. According to (Albergaria 2006: 617) the Convention has clear specifications:

- specifies the requirements of the parties to assess environmental impacts at an initial design phase
- put down the means and processes for escaping, monitoring or decreasing any undesirable impacts on the environment particularly those that will affect more than one country
- elucidates that the impact assessment procedure is the obligation of the authority liable for producing said impacts

(Albergaria 2006: 617) says that after it has been established that the project will have transboundary impacts, the processes of Espoo Convention processes are triggered and they are implemented in different steps as shown in fig. 10. (Marsden 2009: 441) states that the procedure is intended to offer enhanced data for decision makers, as well as include as many concerned parties in the procedure (comprising the community members, NGOs and pertinent government ministries and subdivisions) According to (Bastmeijer and Koivurova 2008) the procedure begins with the country responsible informing the country that will be impacted by the project urgently and should not be as when public participations start in the country of origin. The timely announcement will give the implicated country

time to deliberate its position and say if it wants to participate in the environmental impact assessment process as per Article 3(3). The earlier the information is disseminated the more advantageous it will be, though its effectiveness also hinge on when the development is conveyed to the before the authorities in the country of origin. Moreover (Marsden 2011: 269) if the affected Member State wants to take part in the Transboundary EIA, Article 7(2) of the EIA Directive requires the party of origin to refer to it all the data collected and data on the process, comprising the application for development consensus. Article 7(3) of the EIA Directive obliges both or all parties taking part in the process to organize for the data to be prepared and accessible within sensible time-frames to pertinent consultants, government departments and the communities involved in the impacted party. The relevant authorities and the communities affected must be given a chance before the permitting of the development approval to submit their views on the project. Article 7(4) of the EIA Directive specifies that discussions within a decided period must be entered into concerning the possible transboundary impacts and measures suggested to alleviate or inhibit them. According to (Marsden 2009: 441) sometimes the project can originate in more than one Member State, and have negative environmental impact in more than one Member State as opposed to one Party. Furthermore the country of origin in these cases can also be an impacted country; an example of such projects is the multinational oil transfer pipelines in Europe. In such cases some other international laws have to be implemented on the project too.

The country of origin together with its relevant stakeholders will make sure that the communities of the impacted country in regions expected to be impacted are notified of and given an opportunity to give their opinion scheduled or reject to a planned development. This comprises organizing for the dissemination of the EIA documentation to the relevant people and administration of the impacted and the communities that are expected to be impacted. The relevant stakeholders will also guarantee that observations and remarks and complaints are communicated to the relevant people and administration of the original country, by also demanding that these provisions are conceded within realistic time before the ultimate conclusion is taken on the anticipated development, and that, in the ultimate result on a planned project, the final decision is made to the result of the EIA, comprising remarks, the Espoo Convention certainly affords baseline standards, even though imprecise, for transboundary public involvement (Ebbesson 2011: 249).

However (Albergaria 2006: 617) says that the most significant stage of the process is consultation through which the affected parties deliberate together the importance of the impacts as per Article 5. At this stage the impacted party has the capacity raise its concerns with particular phases of the development that might have destructive impacts. These discussions could take the method of negotiations but without responsibility to reach a collective resolution. The convention is resilient on this opinion: the ultimate resolution rests with the party of origin. The major trials and tribulations of addressing the convention is public participation as all countries are obliged to make sure that there is public participation from the possibly impacted areas. As per Article 3.8 of the Espoo Convention public participation is vital and public thoughts and complaints have to be contained in the ultimate conclusion.

According to Marsden (2011: 269) Article 10a of the EIA Directive applies the third pillar of the Aarhus Convention on right to justice in precise concern to EIA, which has solicitation in a transboundary

Context. Article 10a identifies the importance of right to justice for environmental conclusions across the European Union, as without it the prospects for personal and NGOs to challenge application shortcomings are restricted. Parties to the Convention maintain the authority to choose in agreement with their state legislative structure at what phase conclusions, acts or oversights may be challenged, and what establishes an adequate attention or loss of a right. This may bounds the possible for encounters, even though 'comprehensive access to justice' is identified as an impartial in the Aarhus Convention in influencing what an 'adequate interest' or 'loss of a right' means, which confines parties to the Convention preference. Parties must also afford the communities with concrete data on access to governmental and legal evaluation processes.

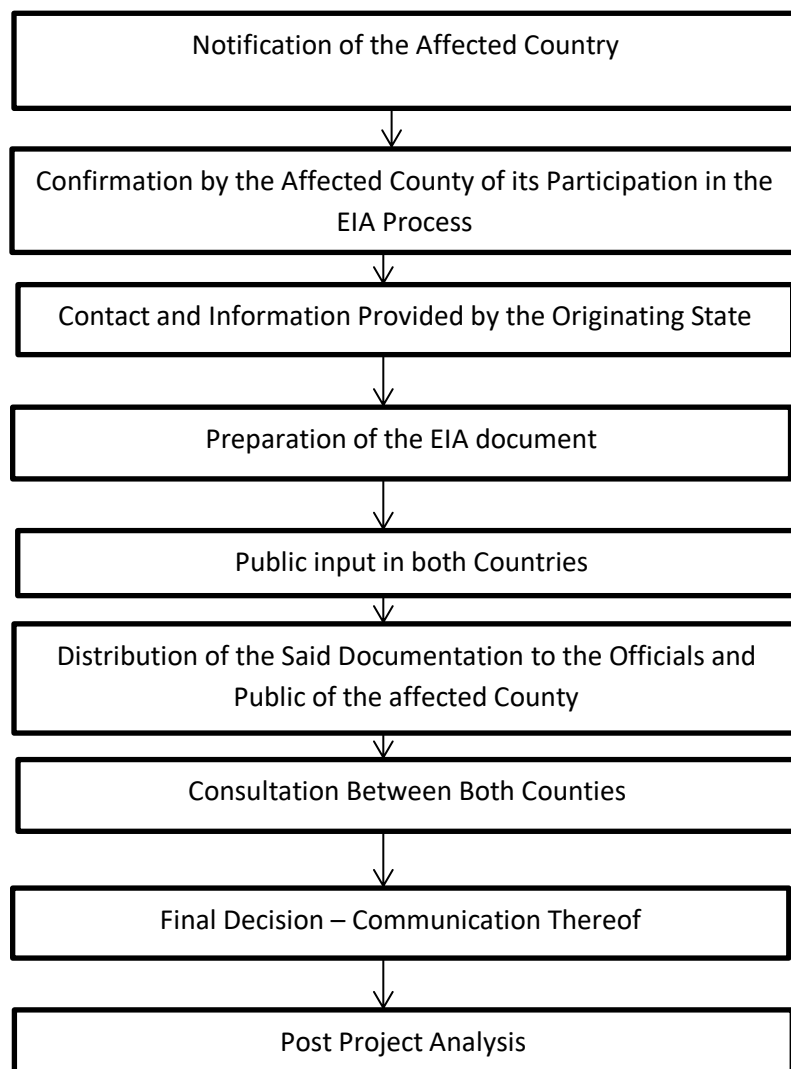


Fig. 10 ESPOO Convention Implementation Strategy: adapted from (Albergaria 2006: 617)

According to Albrecht (2008: 359) Espoo Convention controls makes it mandatory and the responsibility of member states to inform and refer to each other on all main anticipated developments which are expected to have important and substantial effect on environmental transboundary impact. Subsequent to the extension of current arrangements on transboundary cooperation, Article 8 of the Espoo

Convention creates the opportunities for the affected states to make new treaties so that they can satisfy the Espoo Convention commitments. Several member states have the mentioned multilateral and bilateral treaties, for example Austria and Slovakia, Estonia and Latvia, Estonia and Finland, Italia and Croatia, Poland and Lithuania, and lastly a communal treaty between Germany and the Netherlands on transboundary Environmental Impact Assessment.

3.4. Strategic Environmental Assessment

Strategic Environmental Assessment (SEA) is being endorsed through regulations internationally with the goal of including environmental concerns into decision making procedure and refining sustainable development (Li 2016: 55). According to Monteiro (2017: 125) governance and SEA can barely be disconnected. The configuration of SEA structures is extremely reliant on the technical, incremental and fundamental proportions of corresponding governance backgrounds. SEA described as a methodical, constant and inclusive procedure for assessing environmental effects of a policy, plan and program (PPP) and recognizing substitutes to them at the initial suitable (Li 2012: 483). Climaco (2010: 447) describes SEA as the a efficient procedure for assessing the environmental concerns of projected course of action, strategy or legislative initiatives in order to guarantee that they are entirely contained within and properly dealt with at the most primitive suitable phase of decision making on par with financial and social considerations". UNECE Protocol on Strategic Environmental Assessment in transboundary context was adopted in Kyiv May 21 2003 in the course of the extraordinary Ministerial Environment for Europe forum. It came into force on July 11 2010; seven years subsequent to extraordinary summit of the parties of the Espoo convention (Sadler and Dusik 2016).

According to De Mulder (2011: 232) the SEA protocol was ratified by 35 countries in addition the Member States of the European Union particularly parties to the Espoo Convention. The SEA Protocol compliments the extension of multilateral environmental treaties as part of global sustainable development strategy structure. It affirms the three typical sustainable development strengths which are environmental, economic, social development. Furthermore SEA Protocol is seen as a tool that will combat efficiency pitfalls of the environmental impact assessment of developments that have disappointing results of the bottom up methodology as it is component of the international law development basis of sustainable development organizations and apparatuses. Finnveden (2003: 91) states that Strategic Environmental Assessment is the technical instrument, and contained in the structure of SEA is a number of dissimilar kinds of analytical instruments which can be used for evaluations like Life Cycle Assessment, Risk Assessment, Economic Valuation and Multi-Attribute Approaches. (De Mulder 2011: 234) states that Strategic environmental Assessment Protocol is the single multilateral treaty that recognizes and works entirely with environmental assessment requirements at tactical and planning levels. According to Arce (2000: 394) SEA affords the basis for the expression of specific developments in a way that is logical and courteous with the environment, social, political and economic situations. Strategic environmental assessment adds value to superior design, preparations and monitoring procedure and is a good instrument for decision making, as its extra cohesive evaluation processes increase the management between various impact assessments. The major aim of Strategic Environmental Assessment is to enable timely and efficient attention of possible environmental impacts in tactical decision making by authorities. SEA is envisioned to be utilized in

Strategies, procedures and plans say (Finnvedena 2003: 92). It is extensively understood that SEA offers numerous remunerations by entrenching environmental concerns into strategic and planning procedure (Li 2012: 483)

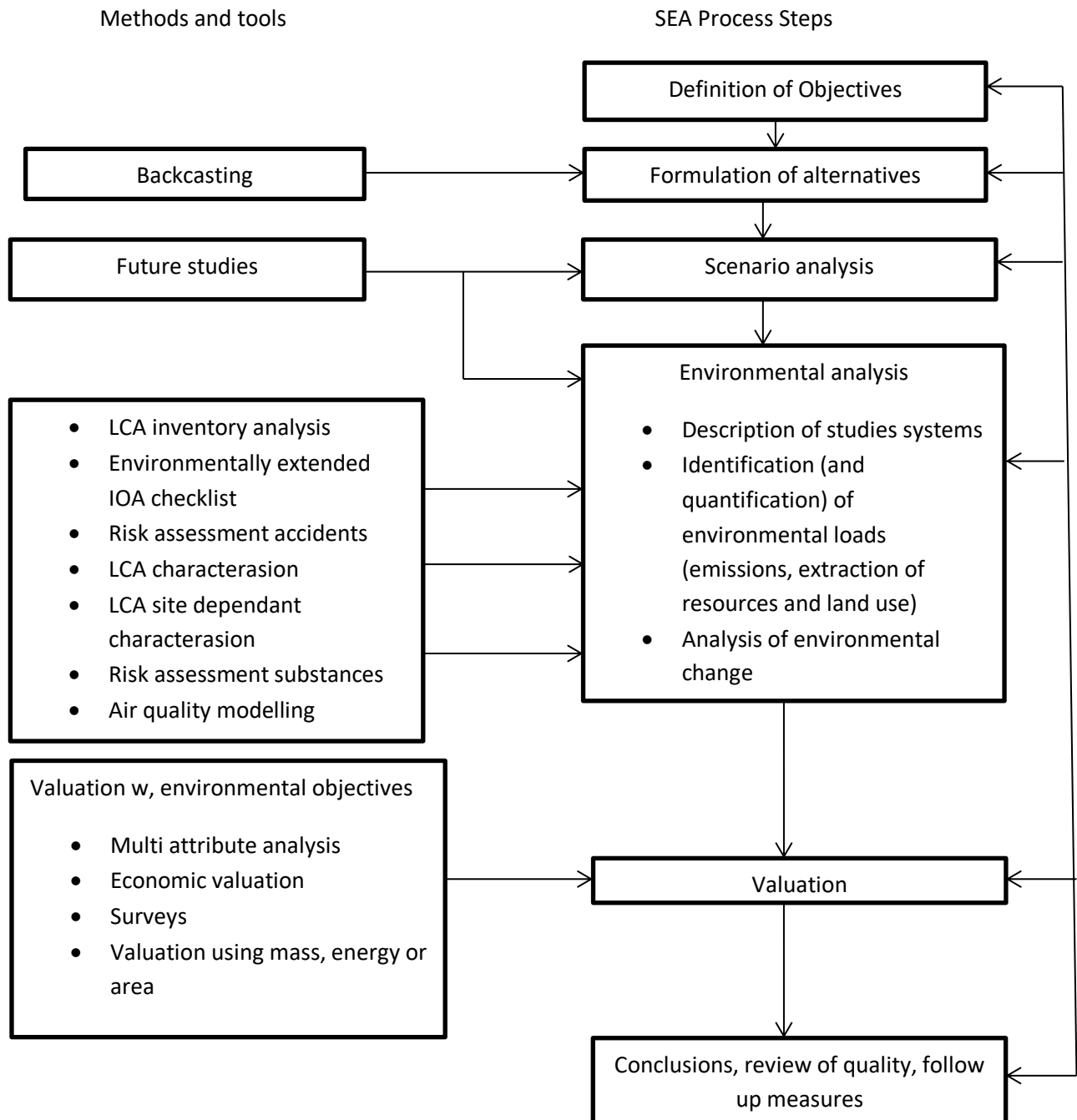


Fig. 11 Relationship between steps of the SEA process and different tools: adapted from Finnvedena (2003: 111)

Albrecht (2008: 290) says that Article 13 requires the countries that have rectified the protocol to contemplate and incorporate environmental issues in policymaking and lawmaking procedures. This is supported up by the requirement to write on their submission of this provision. Transboundary SEA in the European Union is controlled by the SEA Directive 2001/42/EC from 27 June 2001. Therefore, Transboundary SEA is mandatory for all European Union countries and for all the countries that have ratified the SEA Protocol when it comes into force. According to Marsden (2011: 38) Article 8 is apprehensive precisely with EIA and encompasses the screening requirements that regulate whether an EIA must be done for the project in question or not. Undertakings are not itemized but are determined on the foundation of their impacts being smaller than, amounting to, or being bigger than a negligible or momentary effect, which is significantly more rigorous than the normal optional expression appearing in much EIA regulation “probable to have a substantial environmental effect”. The requests also relate to any variations in current activity (Article 8(3)) and provision is made for harmonization of EIA processes when undertakings are mutually planned between more than single Antarctic Treaty Consultative Party (ATCP or Party) (Article 8(4)). More provisions in the Protocol also comprehend obligations for EIA, as well as Article 6 which apprehends collaboration, whereby Member States are to attempt to “(b) offer suitable support to other Member States in the planning of environmental impact assessments” and “(d) refer with other Member States with respect to the choice of locations for potential positions and other amenities so as to evade the accumulative effects produced by their disproportionate application in any site”.

Furthermore Albrecht (2008: 290) states that The SEA Directive comprises the idea of transboundary discussions in Articles 6 and 7. Article 6 obliges the additional discussion with the communities and those stakeholders and government officials that have taken part in the description of the scope. Article 7 of the SEA Directive requires the planning European Union countries to talk with Parties that will be impacted if the originating party anticipates possible substantial impacts on the environment having transboundary impacts on the other country. Article 7 of the SEA Directive also affords those parties with a right to apply for discussions, if the Party is probable to be impacted by the particular strategies and programs in the other countries. Marsden (2011: 38) states that Annex I to the Protocol is apprehensive unambiguously with EIA and comprises eight Articles. Article 1 put emphasis on that the preliminary valuation as to whether an action may have a “negligible or momentary effect” is to happen in agreement with the domestic processes of the Member States to the Protocol. If this is probable, then Articles 2 and 3 are triggered which describe and fix obligations for Initial Environmental Evaluations (IEE) and Comprehensive Environmental Evaluations (CEE). These processes comprise the contemplation of accumulative impacts in Articles 2(1) (b) and 3(2) (f). The more thorough process, the CEE, comprises other requirements like public discussion and involvement in Article 3(2) (3), and the requirement by the Antarctic Treaty Consultative Meeting (ATCM) in Article 3(2) (5).

Arce (2000: 396) identifies these as the following as the main stages in strategic environmental assessment:

1. isolating the aims and objectives of the strategy, plan and organization
2. screening: formulating the necessity and nature of SEA locating aims and goals

3. scoping: evaluating the state of the environment, detecting marginal replacements and explaining the policies, plans and programs (known as PPPS) and the effects to be evaluated
4. identifying the pointers
5. calculating effects and equating substitutes
6. pursuing guidance from peripheral organizations
7. Participation of different stakeholders
8. Give back information on resolutions of the SEA
9. Decision making
10. Mitigation or alternatives
11. Connection to following phases of the cycle and project EIA
12. Monitoring

According to Arce (2000: 394) the input of SEA concerning sustainability arises from numerous points:

1. SEA guarantees that attention will be paid to environmental issues from the start of the decision-making procedure
2. Offers a structure for the sequence of activities
3. Adds to combined legislature creation, planning, and programming
4. Can identify possible environmental effects at an initial phase, even prior to design of the developments.

3.5. Key features of the protocol

Sadler and Dusik (2016) states that while the protocol on SEA was negotiated under the Espoo Convention it is a distinctive legislative tool:

1. it is legally unique tool nationally, that is the nation does not have to be member of the Espoo convention to be party to the protocol
2. contrasting to Espoo convention which relates to projects that are expected to have major transboundary environmental impacts , the protocol relates essentially at the distinct country, to entirely appropriate government strategies and procedures, and to the extend appropriate policies and law regardless of whether they are possible negative effects on the land of another country
3. While it was negotiated by the UNECE Member States, all the Member States of the United Nations can be members of the Protocol

3.6. Differences between Protocol and Convention

1. The protocol has a broader topographical scope because all signatories of the United Nations can become members
2. The protocol offers for a non-obligatory framework for incorporating the environment into the uppermost level of decision making by officials that is to suggestions for regulations and law-making.

3. Other than bearing in mind the environmental impacts of proposed procedures and projects the protocol puts a distinct importance on human health (Sadler and Dusik 2016)

Table 3 Espoo Convention vs SEA Protocol: adapted from Dusik (2016)

Espoo Convention	SEA Protocol
All developments with transboundary environmental effects	Essentially about plans, programs and policies in a member state with concerns for transboundary impacts in mind
Applied at project level	Held at executive level
Transboundary context	Nationally with transboundary concern
Environmental conservation and improvement of multilateral and bilateral relations of member states	Sustainable innovation and promotion of green economy

3.7 Relationship between SEA and EIA

(Arce 2000: 395) says that most people regularly enquire about the difference between SEA and EIA and most asked question is whether SEA necessity to evaluate strategies, plans and guidelines cannot be achieved by the available tool which is environmental impact assessment, and states that the response is no because EIA concentrates on the best implementation particular activities but does not position or structure the objective.

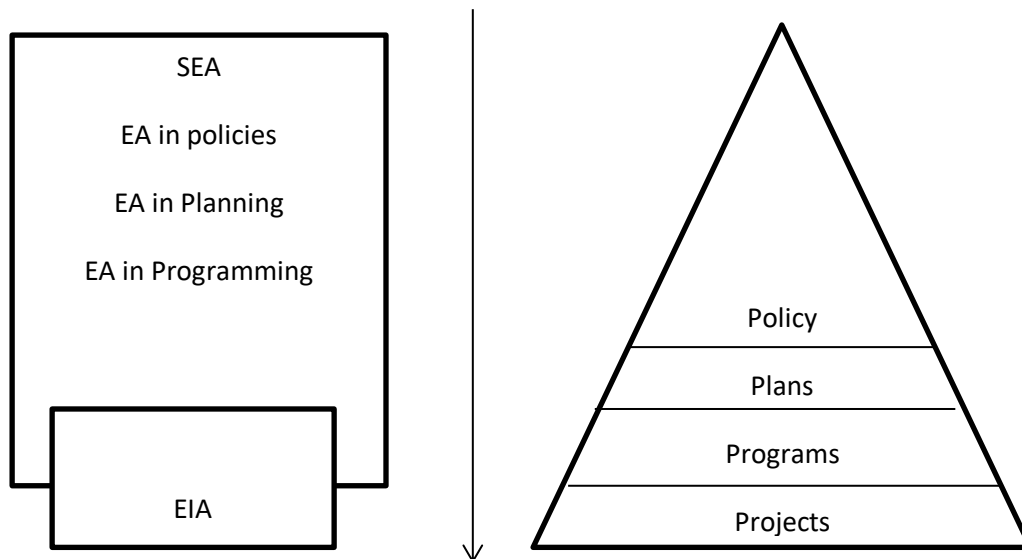


Fig. 12 A tied process of Environmental Assessment. Adapted from adapted from Arce (2000: 395)

Furthermore (Arce 2000: 395) says EIA techniques need stages of inevitability and material that do not usually exist at the phase of planning of Policies, Plans and Programs (PPPs). SEA has the global scope and increase sequential and progressive range of environmental assessments and addresses the cause instead of the indications of environmental destruction. Environmental impact assessment is intensely connected to SEA as shown below. The relationship between SEA and EIA is intense as shown in fig. 11

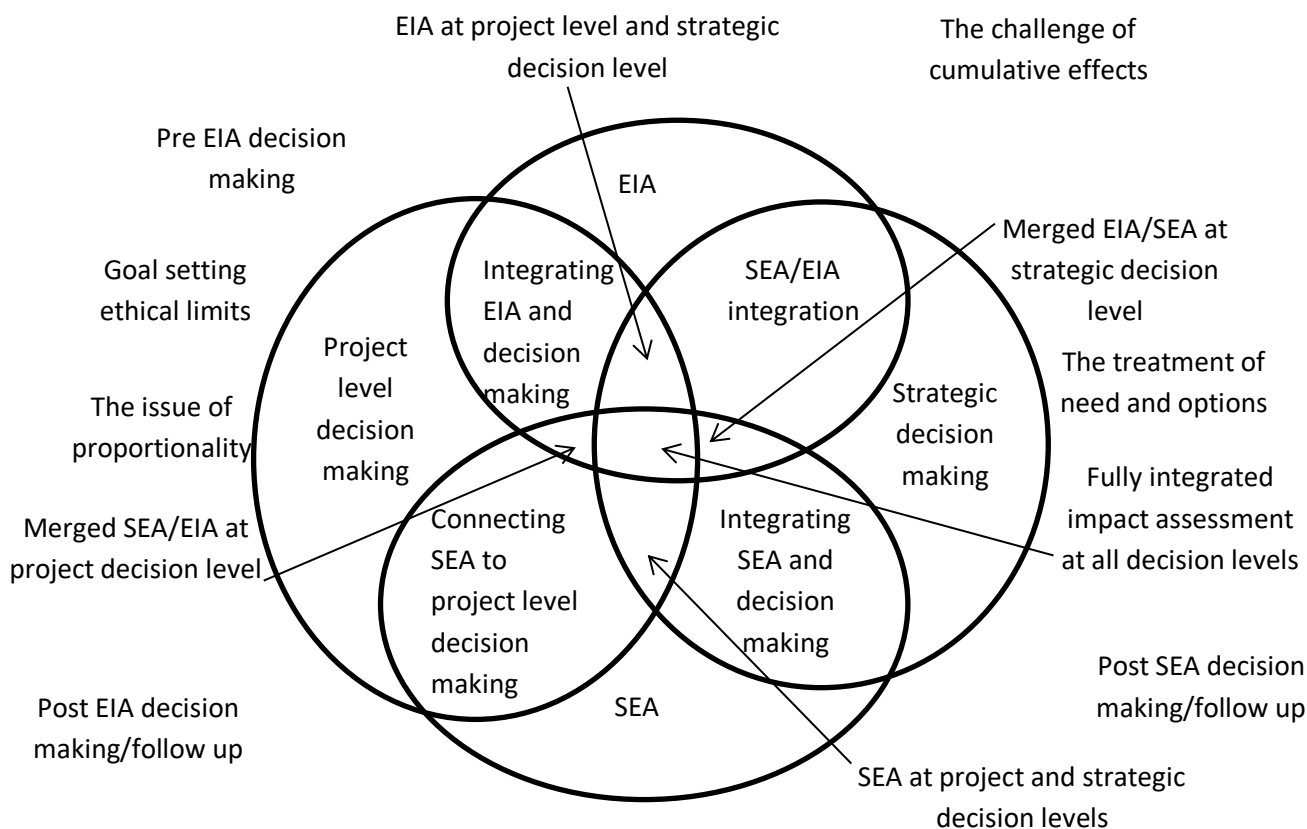


Fig. 13 SEA, EIA and decision making linking and integrating: adapted from Lawrence (2013: 14)

The fig. 12 shows the linkage amongst strategic and project level IA, and amongst SEA/EIA governing and functional application and decision making. EIA can be defined satisfactorily mostly, although with exertion, to include numerous strategic level selections and conclusions. SEA can measure and structure EIA level planning and decision making. EIA level planning and decision making can advise and improve SEA planning decision making. EIA and SEA can be interrelated or even combined once or even at all decision making stages. The connection and incorporation of SEA and EIA level planning and decision making can enable the setting of aims and objectives and principled borders, the valuation of essential and strategic alternatives, the exploration and management of cumulative impacts, the tiering of decision making, further inclusive follow up, and the more methodical management of matters such as proportionality

(Lawrence 2013: 12)

Equally important EIAs go further down to project stages. Similarly SEA simplifies and supports EIA by giving the framework, recognizing at initial phase possible effects and growing impacts, and evaluating matters connected to alleviation and distribution of proposals. SEA details are lesser compared to EIA because SEA address a big zone and include deliberations from dissimilar areas. The information scale in SEA is considerably lesser than in EIA, and this makes Geographic Information Systems (GIS) a very appropriate instrument as shown in fig. 12 (Arce 2000: 396).

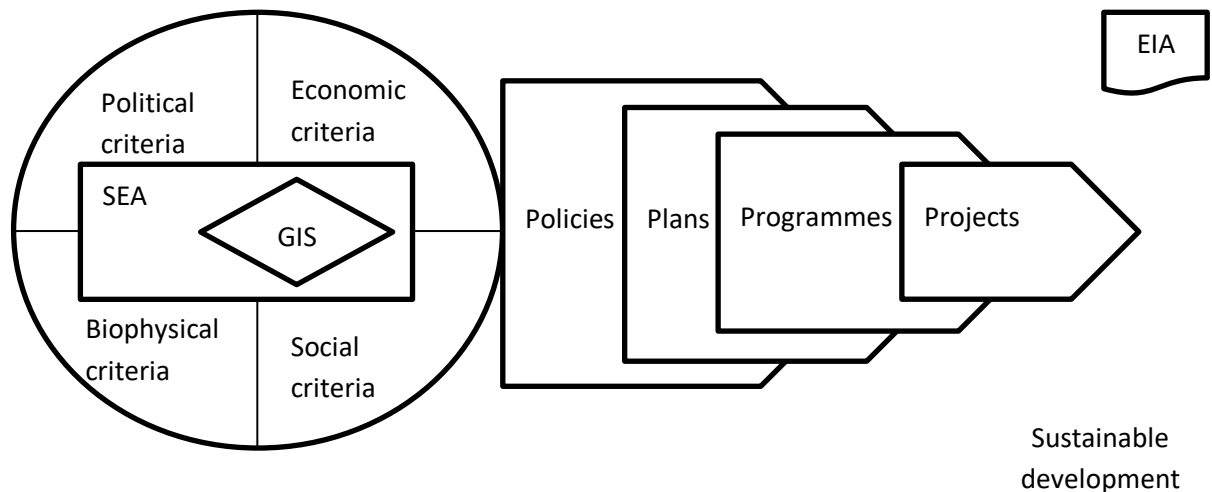


Fig. 14 SEA, EIA, GIS in planning process: adapted from Arce (2000: 396)

According to Vanderhaegen (2005: 126) says that the utilization of GIS for environmental solicitations can be traced many years back. The three-dimensional facet of environmental information is unique of the key detail for this combination. Together EIA and SEA research include the concern of numerous diverse variables and occurrences offering compound interconnectedness, which differ in time and space. Thus, GIS are perfect apparatuses for the exploration of these environmental portents with spatial and temporal dimensions. The initial procedures for the groundwork of environmental assessments depend on lists and mediums to formulate the environmental components, development activities, reliance among ecosystem mechanisms or to vigorous and burden development substitutes. The key restriction of such information systems is the absent spatial dimension. Not every environmental valuation may perhaps be done adequately in a tabular form, and fundamental geographical perceptions such as spatial concurrence, adjacency and connectivity are significant deliberations that might not addressed by these initial procedures. Currently GIS is applied in all phases of the groundwork of environmental assessments, owing to its aptitudes for spatial information incorporation. GIS has the capability to accumulate and save, incorporate, scrutinizes and show information, so it can be used for information preparation, spatial exploration and management of outcomes. Consultants who make impact assessments normally use spatial information to accomplish the subsequent responsibilities: screening and scoping, depiction of the development, instituting of the

environmental reference point effect moderation and regulation, public discussion and involvement, and inspection and auditing. The benefits of using GIS comprise the authority of handling and consolidating spatial information, the decent graphic competences and the simplicity of altering and appraising the data.

Austria Environmental Impact Assessment

4.1. Austrian EIA

According to the Austrian Federal Ministry of Sustainability and Tourism, Environmental Impact Assessment in Austria was introduced as a result of the Directive 85/337/EEC of the European Union whose Article 2(1) binds all member states to assess all projects before they can be approved. Austrian Constitution also puts emphasis on Environmental Protection in Austria and it is spread between the Federal Government the Federal Government Provinces. EIA in Austria is regulated by the Federal Act on Environmental Impact Assessment and the Federal Minister of Environment is the custodian of the Act. The first EIA act of the Federal Government was published in 1993 and has been amended several times with the 2000 amendment currently being used as the Federal Government EIA Act (EIA Act 2000). EIA is mandatory for new projects and projects undergoing major modification listed in Annex 1 of Directive 85/337/EEC and Annex 1, column 1 or 2 of the EIA Act 2000, and the Case by Case Screening of projects listed in Annex 1, column 3 of the EIA Act 2000. These projects include:

- Waste management projects for example landfills for hazardous waste
- Energy industries i.e. thermal power stations
- Handling of Radioactive material
- Infrastructure projects i.e. railway lines
- Mining industry
- Water management i.e. hydropower plants as well as waste water treatment plants
- Agriculture and forestry i.e. rigorous fishing, alteration of unrefined land and deforestation of land
- Other installations i.e. building of new cohesive chemical plants

(Davy 1995: 362) states that the 1993 Act, nonetheless, exceeds the European Council Directive on EIA in two respects. It does not simply oblige collecting and dissemination of information about the environmental impacts of a development, but institutes an inclusive permit structure that surpasses other permits prerequisites for a development project. In addition, it does not merely afford for a "knowledgeable communities" and prospects for public participation in the EIA process, but also gives the right of standing to some environmental interest groups ("*Bürgerinitiativen*") who also may request from the governmental organization to act in accordance with environmental rules and guidelines. According to the Ministry of Sustainability and Tourism different threshold values and definite standards' for protected areas that include, conservation and mountainous regions, water protection and conservation area, areas subject to air pollution and residential areas. Federal Ministry of Transport, Innovation and Technology, together with the 9 Provinces of Government are tasked with issuing EIA permits. Federal Ministry of Transport, Innovation and Technology is responsible of granting the EIA permit for Federal roads, railways and high speed railways as well as their extensions through the Minister of Transport. The other permits are granted at the Province where the project is going to be implemented. The consolidated permit procedure is often used as the EIA permit will integrate all other permits mandatory and essential to the development. There are two methods of valuation used for EIA namely:

1. Specific threshold criteria
2. Case by case examination

The EIA Act (2000) says that the objective of EIA shall be with public participation and the involvement of professionals

1. Isolate, define and evaluate the straightforward and unforeseen impacts that the development will or may have on human beings, biodiversity and their habitats, soil, water, air and climate, landscape, material assets and cultural heritage including interactions of several effects.
2. To evaluate processes that inhibit or mitigate destructive, unsettling or adverse impacts of a development on the environment or that increase its constructive impacts
3. To document the benefits and weaknesses of the alternatives evaluated by the development candidate as well as the environmentally significant benefits and drawbacks of not continuing with the development
4. To document the environmentally applicable benefits and shortcomings of the alternative places or paths assessed by the development applicant in case of developments for which the legislature expects obligatory acquisition

It further states that the Federal Act implements Council Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment, OJ L 175/40 of 5 July 1985, as last amended by Council Directive 2003/35/EC providing for public participation in respect of the drawing up of certain plans and programs relating to the environment and amending with regard to public participation and access to justice Council Directives 85/337/EEC and 96/61/EC, OJ L 156 of 25 June 2003.

Austria established the Federal Court of Administration (Bundesverwaltungsgericht) and the nine Administrative Courts of the Laender (Landesverwaltungsgerichte) at provincial level with the legal Federal Law Gazette I 2012/51 and I 2013/33 which entered into force in January 1 2014. These Courts are responsible for dealing with appeals on EIA procedures however the Supreme Administrative Court (Verwaltungsgerichtshof) remains the highest court of appeal. The EIA Act 2000 sees Community involvement in the EIA process highly significant, therefore EIA process is a vital and provides practical stand where direct and indirect impacts of the particular development are evaluated under all environments are openly and clearly deliberated and valued under the relevant environmental regulations says Ministry of Sustainability and Tourism.

Davy (1995: 364) states that the 1993 Act also transformed the rule of declaring residents as third parties to the permit process. Usually, only individuals whose rights and legally secured wellbeing may be impacted by the development had the right of complaining, restricted to the permissible provisions for the security of third parties. The 1993 Act presented a fresh system of *locus standi*, reliant on natives' involvement relatively than on the possible impact of a development on specific rights. 200 natives, who are registered electorates for national elections in the local municipality or neighboring municipalities and who sign a petition, acquires the right of protesting in the permit process. The privileges of the interest groups ("*Bürgerinitiative*") are not restricted to permissible provisions for the

security of third parties. Somewhat, such a group may elevate any request in fulfillment of the 1993 Act or other environmental rules and guidelines.

Parties with Locus standi in the EIA process as provided for by Article 19 of the EIA Act 2000 are as follows: a) Neighbours or the community which is going to be negatively or positively affected by the project either locally or internationally b) Parties stipulated by the applicable administrative provisions c) Ombudsman of the Environment d) Water management planning body to guard the welfare of water management according to Article 55(4) of the WRG 1959 e) Municipalities f) Citizen groups g) Environmental organisations

4.2. Contents of the Environmental Impact Statement in Austria

Article 6 of the EIA Act 2000 state that Environmental Impact Statement should contain the following information:

1. A depiction of the development including data on the site, design and size of the development and in specific:
 - a) A depiction of the physical features of the entire development, comprising the land-use desires throughout the construction and working stages;
 - b) A depiction of the core features of the construction or handling processes, in specific with respect to the nature and amount of the resources used;
 - c) Information, by nature and capacity, of residues and emissions to be anticipated (water, air and soil pollution, noise, vibration, light, heat, radiation) consequential from the operation and procedure of the development;
 - d) The rise in the concentration of contaminants in the nearby environment subsequent from the development;
 - e) Energy consumption, broken down by energy sources;
 - f) Period of the development's life span and continuation events as well as any events to protect evidence and ensure affiliated control.
2. A framework of the key substitutes considered by the development applicant and an indication of the core details for this choice, captivating into reason the environmental impacts
3. A depiction of the features of the environment expected to be considerably impacted by the development, together with, precise, human beings, biodiversity and their habitats, soil, water, air, climate, landscape, material assets, including the cultural heritage, and the inter-relationship between the above factors.
4. A depiction of the possible substantial impacts of the planned development on the environment resulting from:

- a) The presence of the development,
 - b) The consumption of natural resources,
 - c) The emission of pollutants, the conception of irritations and the nature, magnitude and removal of waste, particularly material on the techniques used to predict the impacts on the environment.
5. A depiction of the methods envisioned to avoid, decrease or, where probable, balance any substantial hostile impacts of the development on the environment.
 6. A non-technical summary of the data stated in numbers 1 to 5.
 7. An sign of any complications (in particular, technical deficiencies or lack of data) faced by the development applicant in collecting the obligatory material
 8. The data on any Strategic Environmental Assessment executed in relation to the terms of Directive 2001/42/EC on the valuation of the impacts of certain strategies and regulations on the environment, OJ L 197 of July 21 2001, p. 30, with significance to the development.

Furthermore Austrian EIA Act 2000 recognizes the Transboundary Environmental Impact Assessment as outlined by the Espoo Convention. Austria ratified the Espoo convention in 1994 as per Article 10 of EIA Act says the Federal Ministry of Agriculture, Forestry, Environment and Water management.

4.3 Scope for high speed railroads according to EIA Act 2000

Article 23b of the EIA Act 2000 says (1) that environmental impact assessment shall be carried out for the High Speed Railroads that undergo more than just extension processes with the existing railroads as per Article 1. This shall be done in agreement with the following section:

1. Erection of fresh lines for long distance railway transportation or their subcategories, erection of other fresh railway lines or their subcategories over the uninterrupted distance of 10 km or more
2. Adjustment of railway lines or their subsets over an uninterrupted distance of 10 km or more, if the length amongst the central of the outmost track of the adjusted path and the middle of the outmost track of the current path go beyond 100 m.

(2) EIA (Article 1) will be implemented in the form of a basic process for the subsequent high speed railroads developments in agreement with this section:

1. Adjustment of lines for long distance railway transportation by a alteration of the path or adding of a track in each occasion over a uninterrupted distance less than 10 km
2. a) Erection of fresh railway lines or their subdivisions, if they share a boundary with a conservation range of Category A, B, C or E according to Annex 2

b) Adjustment of railway lines or their subdivisions, if the length between the central part of the outmost track of the adjusted path and the central part of the outmost track of the current path go beyond 100 m and if they share a boundary with a conservation range of Category A, B, C or E according to Annex 2

c) Adjustment of railway lines by adding a track above an uninterrupted distance of 2.5 km or more if they share a boundary with a conservation range of Category A, B or C according to Annex 2

d) adjustment of railway lines or their subdivisions that have traffic flow capacity of 60 000 trains/year (prior or subsequent to the volume surge) elevating the train volume by 25% or more if they share a boundary with the conservation range of Category E according to Annex 2,

if paying attention to the magnitude and continued effects of the environmental impact, substantial negative impacts are to be anticipated for the conservation area (Category B of Annex 2) or protection purpose for which the conservation range has been established (Category A, C and E of Annex 2) in any definite case, probable are cases in which conservation ranges are only bordered on by protective structures for eradicating hazardous areas or in which current paths are relocated due to disasters.

3. Development as stated in paragraph 1 with the distance below 10 km, if they stretch constantly for the distance of at least 10 km collectively with directly with the neighbouring subdivisions that are not operational yet or were operational for transportation in the space of 10 years and if on the base of the conditions distinct in Article 3 (4) no. 1 to 3, substantial destructive, alarming or negative impacts on the environment are to be anticipated due to a cumulation of the subdivisions impacts in the particular situation and, therefore, the development will be subjected to an environmental impact assessment.

(3) If EIA is to be done for the creation of a high speed railroad according to this section and if this development requires an complementary procedures listed in Annex 1 which is particularly and functionally correlated to this development, EIA shall be executed for the whole development (high speed railroad and complementary measure) in accordance with the requirements of this section. If the streamlined process is specified for the high speed railroad and the complementary measure, this process shall be functional. For all the successive projects processes will be applied. For all the succeeding projects consent processes, new EIA should not be done.

(4) If the erection of a high speed railroad that does not need to be subjected to EIA pursuant to paragraph 1 or 2 requires an complementary measure listed in Annex 1 which is spatially and functionally connected to this development, EIA will be done for the whole development (high speed railroad and complementary measure) in accordance with the requirements of this section. If the streamlined practice is required for the complementary measure, this process will be applied. For all the following projects consent processes, a new EIA should not be done.

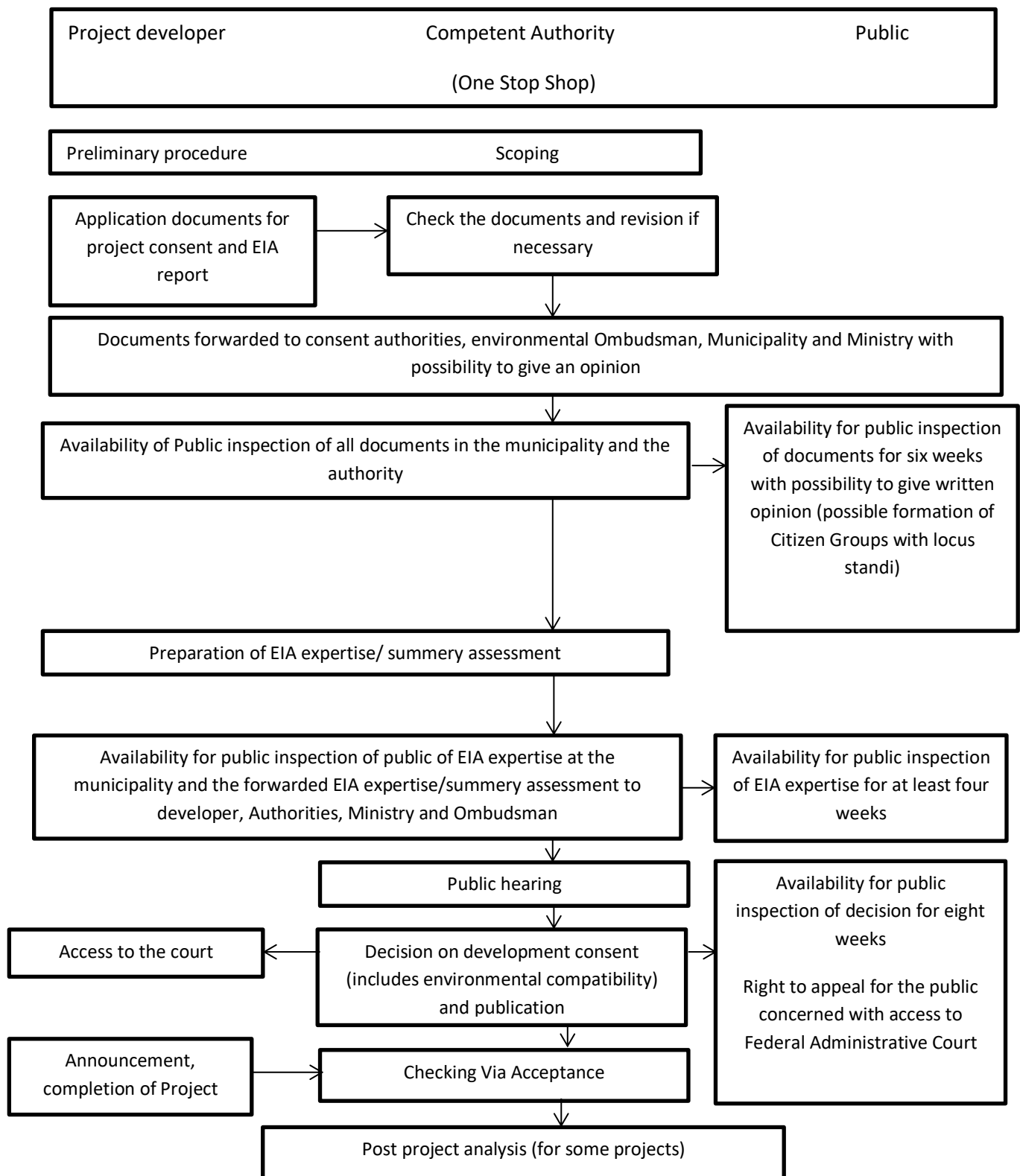


Fig. 15 Austrian Concentrated Austrian EIA procedure: adapted from the Ministry of Sustainability and Tourism

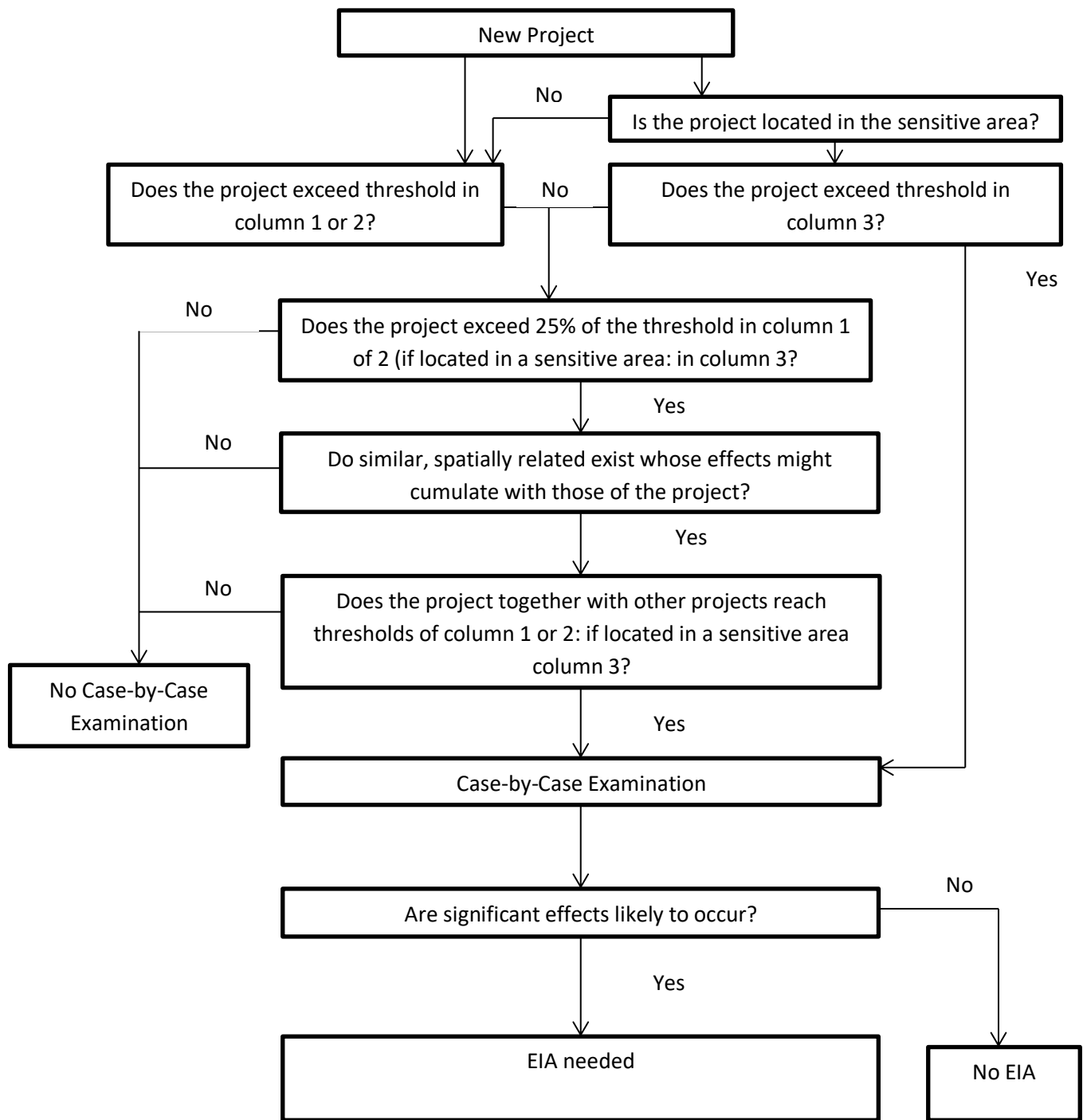


Fig. 16 Austrian new projects screening procedure: adapted from The Ministry of Sustainability and Tourism

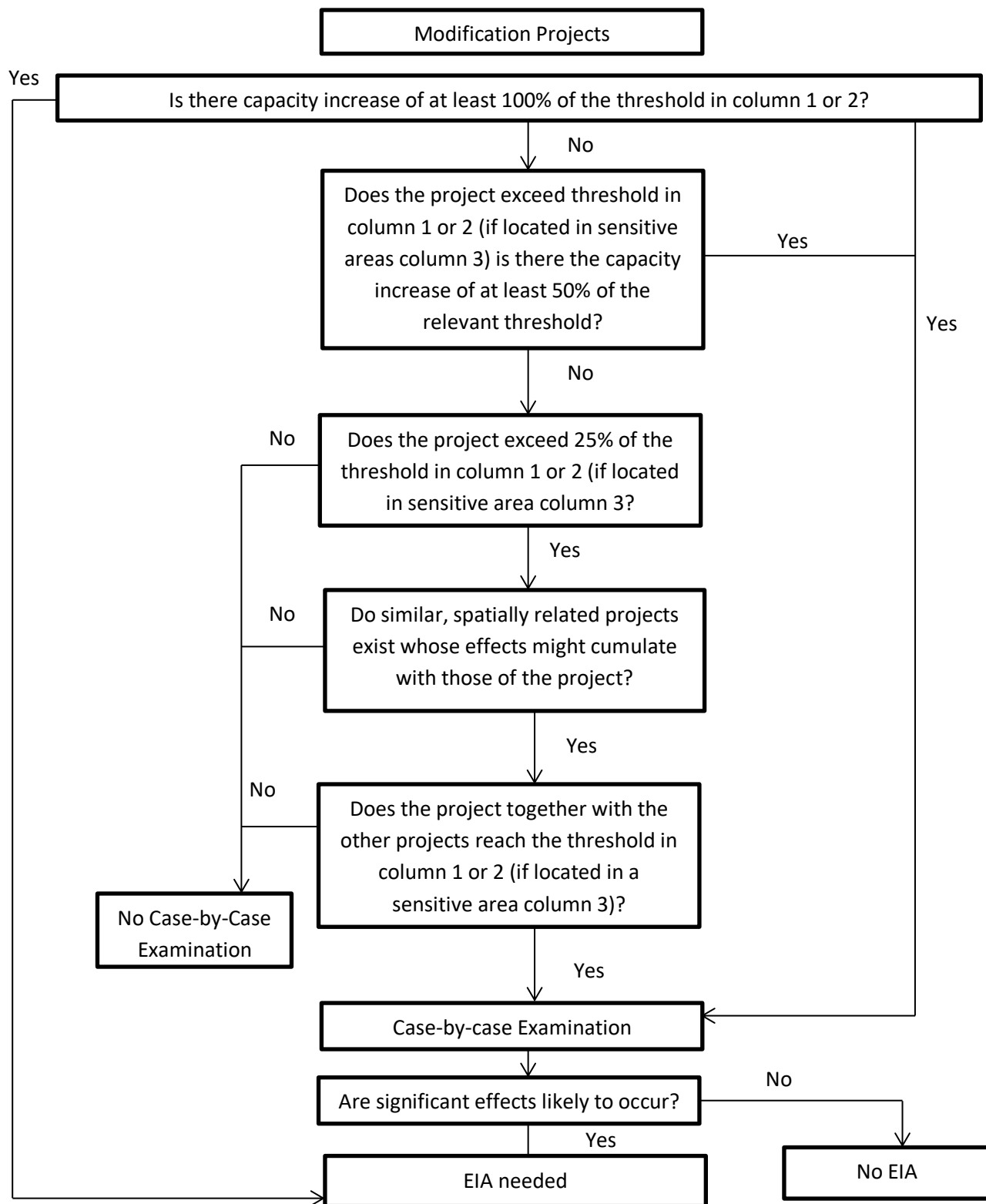


Fig. 17 Austrian modification projects screening procedure: adapted from The Ministry of Sustainability and Tourism

4.4. Initiation of Environmental Impact Assessment

Article 5 of EIA Act 2000 of the Federal Government of Austria explains the processes for the initiation of Environmental Impact Assessment. Article 5 (1) says that the developer designing a project scheduled to undergo environmental impact assessment as per to Article 3 or 3(a) will submit to the government officials an request for project development consent that comprises the records necessary under administrative law for the authorization of the development and the environmental impact statement in the obligatory needed number of copies. As far as precisely probable, these records should also be submitted automatically. Confirmation of approvals should not be reckoned mandatory to the degree that administrative requirements grant tough privileges in this respect. The developer will also mention whether and in which manner he/she has told the community about the development.

(2) If the official papers stated in paragraph 1 are not available in the application or if the data of the environmental impact statement is inadequate, the government official will instruct the developer to balance the application of environmental impact statement as per Article 13 (3) AVG even if this is only apprehended in the development of the project approval process. The government official may possibly specify that some data and documents that are essential for evaluating the environmental impacts may be handed over to the authorities only in a later stage of the process

(3) The government official will converse, without deferral, the application, the appropriate development paper work and the environmental impact statement to the relevant stakeholders for comments. The government officials as per Article 2 (1) no.1 shall collaborate in the methodological and legal evaluation of the development to the encompass mandatory and shall submit applications for the necessary subject fields and the corresponding professionals

(4) The Ombudsman for the environment, the local metropolis or government as well as the Federal Ministry of Agriculture, and Forestry, Environment and Water management shall, be given copy of the environmental impact statement without deferral. Only when Federal Ministry has received a copy of the environmental impact statement can they be able to participate in the EIA process

(5) Other stakeholders and authorities that need to be involved as per appropriate governmental requirements shall be communicated to by the government officials about the reception of the application. If the appropriate governmental requirements openly need precise professional opinions, these will be organized.

(6) The application will be precluded at any stage in the process if it is proven beyond doubt in the during the process that the development cannot meet some development consent necessities to such an extent that these deficits cannot be alleviated by stipulating requirements, circumstances, time frames, development adjustments or counterbalancing or mitigation measures.

(7) The further addition to sentence two of Article 39 (2) AVG, the executive might choose *ex officio* or upon request by the developer that more than one spatially interconnected developments under Annex 1 shall use one environmental impact statement (environmental impact expertise or summary assessments, feedback, talks and meetings as per Article 10 and, if relevant, public participation). Fig. 14

shows the initiation of Environmental Impact Assessment process in Austria, while Fig. 15 and 16 shows the screening process of the anticipated projects either being new or modification projects respectively.

There is however no Strategic Environmental Assessment Act in Austria. SEA is integrated in different department or ministry laws and legislature says the Federal Government Ministry of Agriculture, Forestry, Environment and Water management.

Application for High speed railway roads

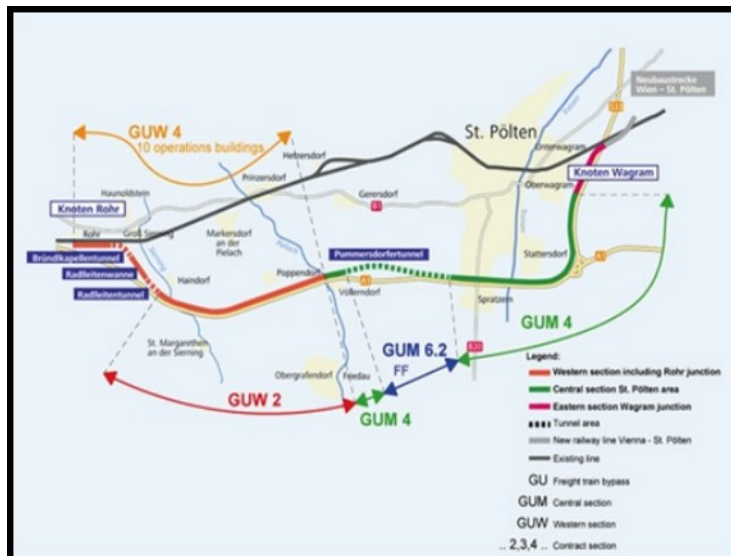
St. Pölten - Loosdorf Freight train bypass St. Pölten (GZU), (**Lückenschluss St. Pölten Loosdorf Güterzugumfahrung St. Pölten (GZU), Abschnitt Mitte**)

I chose this project because it was the first railway project to be subjected to EIA in Austria and it was small yet big enough to give me an insight into the application of EIA in the construction of high speed trains

5.1. Methods

Two questionnaires were given to personnel at ÖBB Infrastructure. The first questionnaire put more emphasis at EIA process itself as well as the contents of the Environmental Impact Statement. The second questionnaire put more emphasis on the construction part of the process in particular the mitigation measures towards water (both surface and groundwater), noise and soil contamination and biodiversity. Environmental impact statement of the project as well as other relevant documentation about the process including documents from the Federal Austrian courts were used in gathering the information about the project. All the project documentation used was from the archives of Austrian Environmental Agency, section of Environmental Impact Assessment and Climate change.

5.2. Project description



The St Pölten-Loosdorf project Freight train is the high performance train route exclusively used for delivery of Goods and not passengers between Vienna and St Pölten; it's on the Danube Corridor which is the significant axis that connects Eastern and Western Europe. It is a four track expansion of the Westbahn route with the speed limit of 120 km/h. It is 24.7 km long and it's divided into three subsections, the East, West and the Center.

Fig. 18, Project route: picture by ÖBB Infrastructure

It has 23 bridges and three tunnels namely Pammersdofer, Radlleiten and Bründlakapelle tunnels. Fig. 18 shows the project route in details.

5.3. Objectives of the project

The main aim of the project was to reduce congestion on the railways and railway stations as this project would provide an alternative route for freight rails.

- Quick and more connections for passengers as the confusion was about which line to use cleared
- Reduction of CO₂ emissions as the railway lines use green energy. Federal Administrative Court (Bundesverwaltungsgericht (Geschäftsyahl(GZ) W1092000179-1/291E) ruling in the case of Vienna Airport third runway stated that Federal Austrian Government through its Ministry of Transport, innovation and technology is aiming to reduce the transport CO₂ emissions by 2.25% by year 2020. Article 69(e) of EIA Act 2000 also advocates for the reduction of CO₂ and other greenhouse gases.
- Reduction of noise pollution in the city
- Capacitation of Danube corridor, especially freight rail services

5.4. Project History

Project planning began in 1992 and ended in 1994. The planning included the routes of the railway as well as the alternative routes. The St Pölten-Loosdorf project is the first Railway project in Austria to be subjected to Environmental Impact Assessment under the watchful eye of The Austrian Federal Ministry of Transport, Innovation and Technology as well as the Federal Government of Lower Austria as per EIA Act 1993, Article 23b. The project does not have any Transboundary impacts as it runs only in Lower Austria and Article 10 of EIA Act 1993 did not apply to it, as a result all the processes of the Espoo Convention did not apply on this particular project. The Environmental Impact Assessment of the project took two years (1995-1997) to complete. During the environmental impact assessment process the public consultations also took place and they were the integral part of the process. The complex and detailed environmental impact assessment was carried out for this project as it passed the sensitive areas. The detailed Environmental Impact Statement as well as the Environmental monitoring plan were prepared after the completion of the environmental impact assessment process. Construction of the project began in 2000; however it had to stop for a period of seven years (2001-2009). Construction began again in 2009, with the construction of the shell ending in 2014. There after followed by the installation of the railway equipment which ended in 2017. The overall construction of the project ended in 2017 and was also commissioned and inaugurated in December 2017

Section 3 of the EIA Act 2000 deals with the environmental impact assessment for Federal roads and high speed railroads, Article 23a deals with the scope for federal roads and Article 23b deals with the scope for high speed railroads. These two Articles are tight together in Section 3 of the Act because their EIA procedure is the responsibility of the Federal Ministry of Transport, Science, Technology and Innovation because most of the times one project runs in more than one province and therefore the EIA documentation for one project cannot be approved in two or more different provinces. This project triggered Article 23b of the EIA Act 2000 because it was a modification (expansion) to four track high speed railway line with more than 10 km long distance, the length between the middle of the outer

most pathway of the altered railway and the middle of the outermost pathway of the current railway is more than 100 m. The railway also passed through some sensitive areas, the was the addition of tracks for the distance more than 2.5 km and the significant negative impacts were to be sustained to the habitats along the route. Given the above information the project was therefore subjected to EIA and the EIA process was carried out and the Environmental Impact Statement of the project was submitted to the relevant authorities for approval. The construction phase of the project only started after the environmental impact statement was approved.

Environmental Impact Statement of the project contained all the required information by the Federal EIA Act 2000. The first two pages of the (Umweltverglichkeitserklärung) environmental impact statement contain the non-technical summary of the project as requested by the EIA Act 2000. The Umweltverglichkeitserklärung also contains the description of the project as well as the location of the project including the duration of the project. The project was initially planned to take five years, however its closure for five years meant that the project had to go way over schedule as it was only completed in 2017 as opposed to 2006 as it was initially thought. Umweltverglichkeitserklärung also gave an estimate of the soil material that would be excavated (3.78 million m³) of which only 2.49 million m³ can be repurposed the remaining 1.29 million m³ could be reused. Most of the remaining 1.29 million m³ was reused for landscaping along the railway line as well as on the newly constructed recreational sites.

The recreational sites as well as conservation or ecological sites were constructed as the part of the compensation of the lost green space during the construction phase of the project. These included the construction of ponds and they were constructed relative to their neighboring topography and they were made to blend in with the geology in which they were constructed. The dams would be feed by rainwater and the fluvial systems that are channeled into them. The fluvial systems were channeled into the dams to avoid gully erosion and land degradation in the vicinity of the railway line. It is worth noting that the water channeled into the dams is largely from the drainage systems originating from the railway line construction. The remodeling of the main fluvial systems was avoided as those would have major impact on local landscape as well as the ecology of the water systems and other places locally, regionally and internationally. It is for this reason that the processes of the Espoo Convention were not followed in the EIA process of this project. Bridges were constructed over the following water systems Traisen, Pielach and Sierning, along the West autobahn highway with minimal impact on the water ways. As with any construction project mass transportation of material was unavoidable and the following effects were expected to arise during mass transportation during the construction phase of the project:

- Transportation costs
- Noise pollution
- Dust pollution
- Air pollution as result of CO₂ emissions by the trucks
- Use of traffic (autobahn) for deliveries
- Vibrations emissions

This data is also a major requirement of the environmental impact statement in Austria. The CO₂ emissions were somehow avoided because the most material was transported using rail way lines and ÖBB railway lines use green energy. Communities were often notified in case there was going to be noise produced during the construction phase. Blasting was done at night and mostly during the weekends when the residents are not home. This was done for the best interest of the communities because they did not have to walk or drive in the dust as well as breathing the dust particles. It was stated in the Umweltverträglichkeitserklärung the estimate of the energy needed and that the energy used in the project was green energy from the ÖBB energy storage systems mainly solar and wind energy. The energy requirements for the trains using this route were assessed by means of simulation calculations on the basis of simulation program STRELE (version 4.0). It was also identified during the EIA process that a lot of parking space was going to be lost and parking space was integrated in the landscaping along the railway line.

5.5. Results

5.5.1.1. Challenges of EIA in this project

- Lots of noise pollution and loss of recreational areas next to Stattersdorf and Spratzern communities along the route of the railway
- Materials from the Pummersdorfer tunnel had to be deposited somewhere. This meant mass management of soil material and dust pollution prevention along the route that the material was going to take
- Loss of forests and biodiversity in ecologically reach habitats
- Loss of parking space
- Protection of cultural landscapes along the route
- Purification of construction waters before being released into the receiving water bodies
- Because it was the first Railway to be under EIA in Austria the technical expertise was somehow limited
- Being taken to court by community members

5.5.1.2. Pitfalls of EIA in this project

1. Parties with LOCUS STANDI had too much power
2. EIA approval permit did not serve as the one stop shop for this project as series of other permits were needed before construction could start. These included:
 - Railway approval as per Federal Government of Austria Railway Act of 1992
 - Water law approval, this protected the receiving water bodies and obligates the project to have proper drainage structures
 - Legal road approval
 - Forest protection approval
 - Nature conservation approval

3. Limited budget as the project was funded by the European Union

5.6. Remedial processes to some challenges

For this project there was some clearing of the land that took place before the construction began.



This included the construction of ecological gardens, reed layers as well as pond/dams as shown in Fig. 19 next to sensitive areas. These structures we constructed to facilitate the transition of the animals into the new habitat and also to compensate for the surface water bodies that were going to be destroyed as well as loss of biodiversity in the construction phase of the project. Furthermore the pond will be of great significance for groundwater recharge. The animals especially birds moved to the new ponds by themselves however plant species had to be rescued from the original habitats to the newly constructed ecological gardens. The ponds will also be useful for the encroaching shrubs and trees as their water demands will be met by the water from the ponds in the near future.

Fig. 19 the pond (dam): picture by ÖBB Infrastructure

The ponds will also have a significant positive impact to the communities near the railway line as they can be used for recreational purposes as well as providing much needed water to the live stocks from the communities. Coconut mats were used to line the base of the ponds; this was done to ensure that the water would not be contaminated with toxic material as the coconut mats are natural and biodegradable



Fig. 20 the noise barriers: picture by ÖBB Infrastructure

During the construction phase of the project there was little noise, CO₂ emissions as well dust generation as the construction material was bought into the construction site using nearby railway lines powered by Green energy like hydropower and solar panels making the project environmentally sustainable in comparison to construction material being brought into the project site by the trucks. Any other emissions produced by the project are compensated by planting trees in the forests of Costa Rica and the ÖBB customer forest near Vienna.

Noise barriers were also constructed near heavily populated residential areas as shown in Fig. 20, this helped barricade the noise during construction phase and will continue to do so during the operational phase of the project. For general waste, waste bins were provided on site and were regularly collected and dumped in the local landfill site. There is hardly any toxic waste on site but it can be produced by accident during the construction phase as heavy machinery is used. In case of an accident the pollutant is removed instantly to avoid further contamination of soil or even ground water. The contaminant is documented and the relevant authorities are notified of the accident.



The soil material that was produced during the excavation and construction of tunnels were recycled on the project site and reused. Most of the soil was used in the rehabilitation process of the project and formed the major part of landscaping and creation of ecological gardens. Over 80 hectares of ecological areas, including recreational areas between the communities and the railway embankment, drainage systems and dam embankments have been constructed.

Fig.21 tunnel construction: picture by ÖBB Infrastructure

Fig. 21 shows the construction of the tunnel and the excavated part of the tunnel. Forest trees and bushes were also planted next to the rail way lines and were made to blend in with the nearby communities as shown in Fi. 22. Approximately further 10 hectares of recreational area has been constructed in the urban area of St Pölten as compensation for the greenery lost during construction phase of the project. Construction site waters were purified discharged and their infiltration rate controlled. Infiltration of railway way waters is also controlled. Flood protection measures across the railway line and the nearby communities have also been put in place.

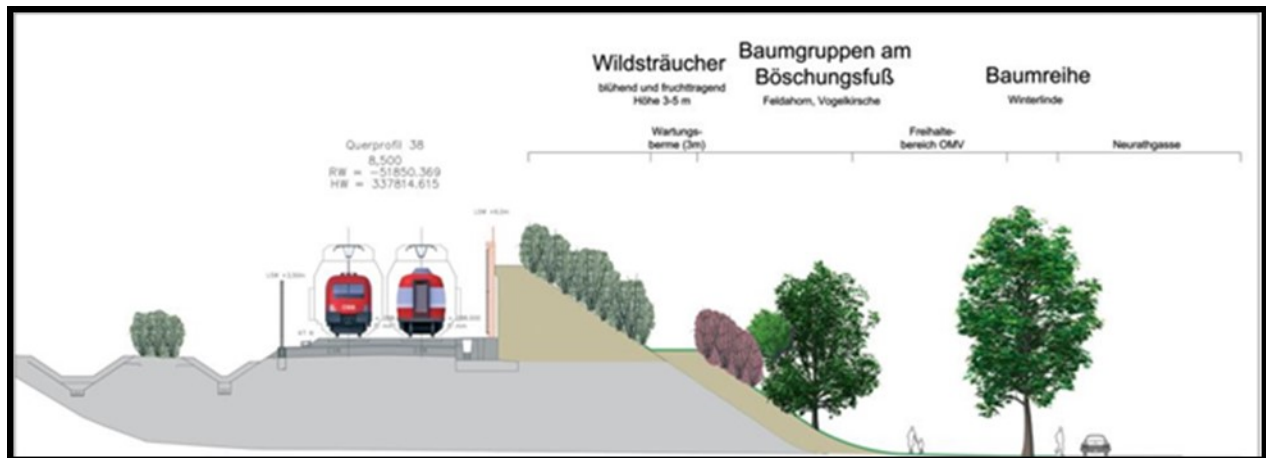


Fig. 22 landscaping along the railway: picture by ÖBB Infrastructure

The tunnels in this project are world class with state of the art equipment. Pummersdorfer has the tunnel tracking system for safety purposes as well as the additional emergency exit tunnel as shown in Fig. 23. The tunnel has the clear drainage system with the course bituminous base.



Fig. 23 Pummersdorfer tunnel emergency exit: picture by ÖBB Infrastructure

Various parties with Locus Standi did however take the project to court. These included the 22 community members even though the Law states that the petition needs to have 200 or more signatures are needed before the community can take the development to court as well as the Environmental Interest groups claiming that the project developers did not follow some processes. The Constitutional Court ruling of 28.06.2001 said the developer should address the complaints of the community and take them into consideration moving forward.

The project has proven to be sustainable especially after it resuming construction after the temporary suspension because of the following:

- It was never taken to court again
- Issues concerning water bodies were dealt with accordingly with little or no negative impact on the environment
- The CO₂ and other greenhouse gases emissions were compensated for by planting trees along the railway line, ÖBB customer forest near Vienna and the forests of Costa Rica.
- All the sites that were affected during the construction have been rehabilitated mostly by landscaping
- The electricity used during construction was from the Green sources
- Conservation or ecological gardens were created for the flora and fauna whose habited would be affected during the construction phase
- Lost recreation sites lost during construction phase of the project were compensated for with over 80 hectares of green space (ecological and recreational space).

- During the operational phase of the project the trains will run on Green energy as opposed to fossil originating energy

Summary of the results

This project is the first railway project to be subjected to environmental impact assessment in Austria as a requirement of Article 23b of the EIA Act 1993 at time now known as the EIA Act 2000. The right EIA processes for this project as the alternative route was also selected as the EIA also done. Public discussions were held during the EIA process which is pivotal for any process under EIA. The EIA documentation or the EIS put more emphasis on the water, ground surfaces, climate and ecology of the region. The necessary mitigation measures were put in place to ensure that the project cause as little negative environmental impacts as possible. The lost biodiversity, recreational facilities, drainage systems and forests were compensated for by construction of ponds, drainage systems, new recreational facilities, planting of trees and rescuing endangered biodiversity into the ecological gardens before the actual construction of the railway line began. Soil material excavated during the construction phase of the project was used for landscaping along the railway line, only small amount of the soil was relocated and the necessary measure were taken to ensure that there was no dust pollution during the transportation of the soil material. The CO₂ emissions were also very low almost negligible as most of the transportation of the construction material was done by rail way. Natural material was used for lining the ponds as well as retaining the soil during landscaping. Regardless of the good practices the project did however still encounter some challenges and did have some pitfalls too.

5.7. Outlook

The Federal Government of Austria environmental Impact assessment process can be improved in some areas. The public have too much power over the process, sometimes a project that is of great significance to the community, region and a country as a whole can be prevented to happen by the members of the community which might end up with a lengthy and expensive legal battle like with this project and Vienna airport third runway project. It would also help to make sure that after the Public Participation was concluded (which the community members and the Environmental interest groups are part of) and the environmental impact statement of the project approved by the relevant authorities, issues dealing with the EIA processes not be taken to court unless they are issues arising during the construction phase of the project. Other projects that use road more than railway for transportation of their raw materials for construction should be made to compensate their CO₂ and other greenhouse gases emissions by planting trees in Austria as this will help the fight against Climate Change. The groundwater test should also be made mandatory for some months after the completion of the project to make sure that there is no groundwater contamination after the completion of the project.

Perspective

6.1. International

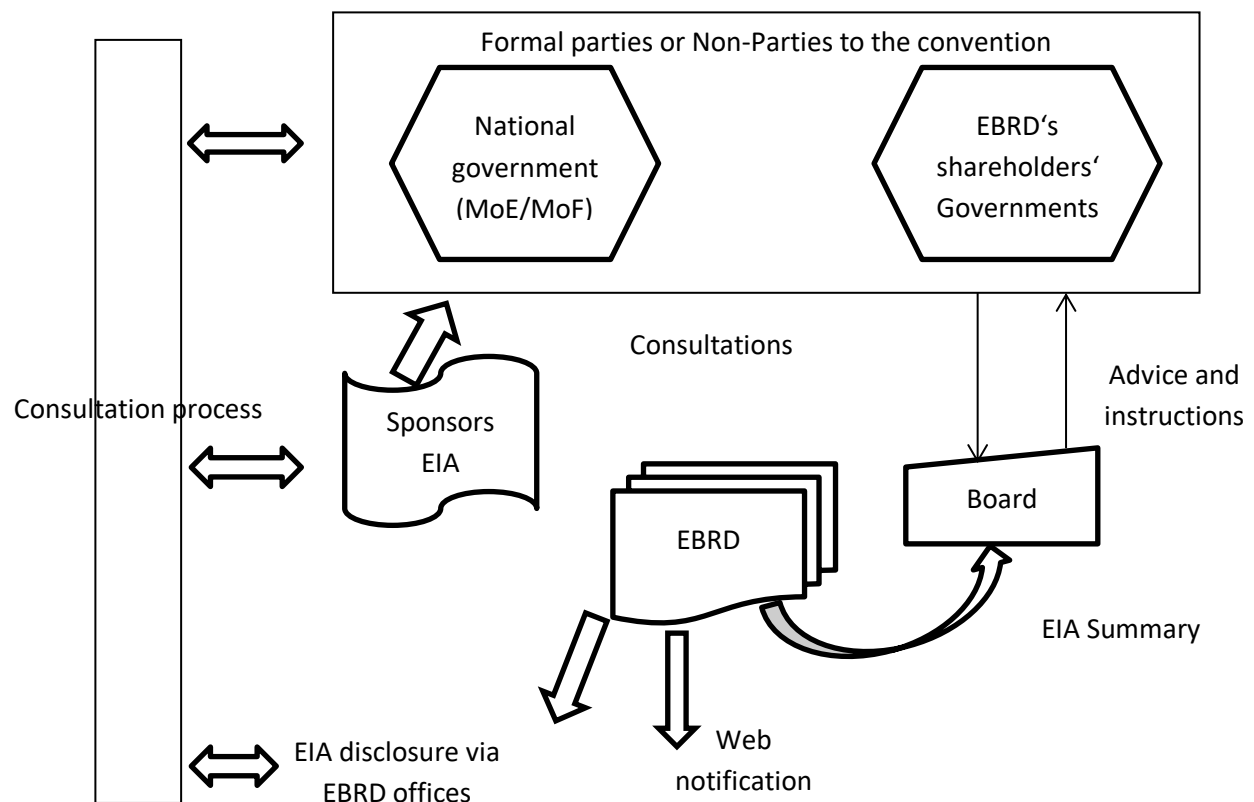
(Hilden 2001: 538) highlights that the convention did not only force its parties to meet the convention requests but also the national Environmental Impact Assessment law in the member states were also impacted by the Convention by developing the basis for European Union regional block and bilateral treaties on transboundary environmental impact assessment. Nazari (2003: 448) states that in the 2001 Sofia Declaration, the ministers of the European Commissioner for the Environment especially invigorated IFIS like the European Commissioner Bank, European Bank for Reconstruction and Development, the Asian Development Bank and the World Bank, to produce and completely impalement environmental impact assessment processes that are in line with the convention to investment developments with state or transboundary impacts and also these organizations to help the governments in the state of source to perform environmental impact assessment in line with the values and procedures. He further states that European Bank for Reconstruction and development (EBRD) is the bank that is focused on its promise to “support, completely variety of its undertakings, environmentally sound and sustainable development”.

Furthermore according to Nazari (2003) while EBRD is not a member and never ratified the Espoo Convention its Environmental procedure states that the bank will, pursue its obligation to provide through investment the application of significant multilateral and regional treaties on environmental and justifiable and sound development, comprising the Convention of Environmental Impact Assessment in a Transboundary Context. EBRD’s Environmental Processes entail and allow additional disclosure and consultation with the members of the public as shown in the consultation process (Fig. 24). The EIAs are made available for community consumption in EBRD’s Business Information Centre (BIC, based in London) and EBRD’s Resident Offices (RO). The Executive Summary of the EIAs is also given to EBRD’s Board of Directors. They communicate the environmental impact study documentation to their government organizations for their evaluation, comments, and guidelines. Based on the comments and criticism given by their government organizations, EBRD’s Board of Directors agrees, refrains, or does not grant backing of each investment project.

The Espoo convention is an international success story as it was referred to International Court of Justice against the Pulp Mills on the river Uruguay. Boyle (2011) says that The International Court of Justice 2010 judgement in Pulp Mills on the river Uruguay is the greatest noteworthy power of environmental impact assessment and International Law in as a whole. It is the initial incident on which an international court has believed that a subsequent assessment of transboundary impacts is not simply a treaty based commitment but a prerequisite of general international law. It is also the first case to consider the content of such an EIA. The case focused on the building of a wood pulp meal in Uruguay. The waste water from the mill would be directed into river Uruguay which forms the boundary with Argentina. He further states that Espoo is regional Convention and it binds its parties and it cannot be anticipated that its expressions have been interpreted into customary international law after it was quoted during the trial. However key components of environmental impact assessment in accustomed international law thoroughly follow the core

fundamentals of the Espoo Convention. There is a requirement to do environmental impact assessment in condition where substantial transboundary harm is expected, the possibility of harm can be anticipated for the kind of undertakings listed in Appendix I of the Espoo Convention, the provisions on notification and cooperation are all stipulated in the customary international law, post project analysis or monitoring is obligatory in both the international law and Espoo Convention.

Fig.24 EIA disclosure and consultation facilitated by EBRD: adapted from Nazari (2003: 444)



According to Boyle (2011) the International Court of Justice (ICJ) delivered the verdict on the Pulp Mills case and it was considered the most important authority on EIA in General International Law. The wastewater from the plant would be released into the river Uruguay which shares the boundary with Argentina. There is no mention of EIA in the Statute of River Uruguay of 1975 and neither Argentina nor Uruguay are the members of the Espoo Convention since it's the European EIA Convention and neither of the two countries EIA legislature include the Transboundary Environmental Impact Assessment, thus Uruguay did not consider transboundary impacts in the EIAs done for the construction Wood Pulp Mills. The ruling stated that it should be well-thought-out obligation under general environmental law to undertake EIA where there is a threat of planned manufacturing activity have vital negative effects on transboundary context, specifically on a communal resource, particularly so if the EIA on the probable impacts of the waste water discharge or any other job being carried out would affect the water quality of the river especially if there are no mitigation measures in place. Espoo Convention, Rio Declaration on

Environment and Development, and Article 7 of the International Law Commissions (ILC) Draft Articles on Prevention of Transboundary Harm from Hazardous Activities, played a significant role in the case with the processes very similar to the Espoo Convention ruled to be followed by the court before the implementation of the project and only with the blessings of the country to be affected by the project. Argentina and Uruguay may not be members of the European Union but the European Union Espoo Convention had a big influence in their dispute because it was more detailed than the General International Law and the Customary Law

6.2. Conclusion

The project critically reviewed Environmental Impact Assessment processes as required by the EIA Act 2000. It can also be concluded that for infrastructure project especially the construction of long distance railways lines environmental impact assessment processes are followed since they belong to the same developer (ÖBB infrastructure). This project was the first ÖBB infrastructure project to be under EIA and the developer learned from the mistakes made on this project therefore enabling them to avoid repeating the same mistakes in subsequent developments. The project is also sustainable and this means all ÖBB infrastructure developments are sustainable as the same methods are used for all their projects.

The project followed the European Union Directive 85/337/EEC and The Federal Government of Austria EIA Act 2000 the EIA processes. It followed the directive and the Act as they require EIA to be performed for the new construction and modification projects of the high-speed railway lines. The possible adverse environmental impacts were established and the mitigation measures were put in place during the construction phase which led to good environmental management practices. The project was also sustainable during the construction phase as the nearby railway lines powered by green energy were used for the transportation of raw materials to the construction side. As a result there was less CO₂ and other greenhouse gases as opposed to heavy machinery and trucks being used for the transportation of the construction material. This also means that large quantities of material could be transported at one go as the good number of rail carriages was used. Moreover the use of railway guaranteed that less noise pollution on the communities next to the highways as it would have been if the trucks and heavy machinery were used and since there is traffic congestion along the highway leading and passing by the construction side. The sustainability of the project will continue even after the project has been completed because trees and shrubs were planted along the railway line and this will help regulate any greenhouse gasses that may be emitted on the railway line. More importantly the railway line uses green energy for everyday operations and this is will enable Austria to reach its goal of reducing CO₂ emissions by 2.25% by year 2020 promoting good environmental management practices at National level.

Is Austria following Environmental Impact Assessment process in infrastructure projects as contained in the European Union Directive on Environmental Impact Assessment?

Yes, Infrastructure projects especially high speed railways follows EIA processes as contained in European Union Directive on Environmental Impact Assessment and The Federal Government EIA Act 2000

Is EIA used as a tool for sustainable development in European Union?

Yes, EIA is used as a tool for sustainable development in European Union especially in high speed railway construction in Austria

Is EIA used as a tool for Environmental management in Austria?

Yes EIA is used as a tool for environmental management in infrastructure projects in Austria

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