

COMPARATIVE EVALUATION OF ENVIRONMENTAL IMPACT ASSESSMENT SYSTEMS IN THE UNITED KINGDOM AND PAKISTAN

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ABSTRACT: Environmental Impact Assessment (EIA) is a vital instrument for fostering sustainable development ensuring the identification, evaluation, and mitigation of impacts on the environment caused by developmental projects. In comparison, developed countries like the United Kingdom (UK) have a well-established EIA framework as a mandatory practice contradictory to developing nations like Pakistan, who are still striving to strengthen the EIA process. Despite this status of development, both countries share the global responsibility of preserving the environment. The current research critically compares the EIA evaluation methods in the UK and Pakistan by examining the Environmental Statements (EA) from the UK and baseline studies from Pakistan. It focuses on the areas where the system differs by analyzing essential steps such as screening, scoping, alternative analysis, EIA report preparation, decision-making, and monitoring. Wood's Model and Lee and Colley's (1992) Review Package are employed to evaluate the quality of the EIA conducting process. Findings indicate that the UK's EIA framework is robust and effectively integrated into project planning to ensure informed decision-making. While Pakistan's EIA framework, in contrast, is facing challenges such as technical deficiencies and weak enforcement, leading to limited capacity in assessing and addressing environmental impacts. Focus on the gaps in Pakistan's EIA framework is crucial in aligning with international standards to achieve sustainable development by embracing lessons from the UK.

Keywords: Environmental Impact Assessment (EIA); Sustainable development; Environmental Monitoring; Baseline Studies; Environmental Statement.

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INTRODUCTION

In today's world, Environmentally sustainable systems are progressively being accepted as they promote economic development without compromising the environmental protection that is necessary for our long-term existence [1]. Environmental Impact Assessment is considered a reliable tool to advocate sustainable environmental development, but its precision is under increasing inquiry [2]. Environmental Impact Assessment (EIA) is a method for efficient detection, estimation, and evaluation of environmental impacts of a planned project [3]. Globally, EIA is considered one of the best-known methods of achieving the United Nations' Sustainable Development Goals (SDGs) with a major focus on climate action, sustainable development, and accountable consumption [4]. This concept has been embraced by more than 100 countries around the globe since introduced in the early 1970s in the United States [5], [6]. Primarily, EIA was mostly limited to developed nations, but eventually, it became progressively more recognized in developing countries [7]. It is observed that

although EIA in developing countries found its origin in the mid-1970s its implementation lagged considerably behind that of the developed countries [8].

Historically, in the UK, the Environmental Impact Assessment (EIA) was officially proposed in 1988. It is known to be a well-integrated and structured process that communicates planning and decision-making [9], [10]. Local Planning Authorities (LPAs) supervise its execution and make sure that all stages—screening, scoping, impact assessment, reporting, and monitoring—are systematically performed [11]. EIA in Pakistan was initially brought forward through the Environmental Protection Ordinance 1983. The Environmental Impact assessment procedures were further improved under Pakistan Environmental Protection 1997, but they only became fully functional with the implementation of EIA regulation in 2000 [12]. In contrast to the UK, Pakistan experiences challenges, including inadequate and insufficient expertise, institutional capacity, and political pressures that demoralize the EIA process [13]. Evidence suggests that regardless of a structured legal basis and

detailed EIA standards, Pakistan still could not yield satisfactory results [5].

EIA is an important tool to achieve the United Nations' Sustainability goals as per the Rio Declaration 1992 [14]. Being a signatory of the Rio Declaration, Pakistan needs to focus on the EIA practices as it is facing a speedily flourishing economy along with rapid population growth and development. Not only the environment but also Pakistan's socioeconomic fabric has been negatively affected by poor natural resource management and unplanned development [15].

To further understand Pakistan's position in the field of EIA, its Environmental Impact Assessment practices are compared with the UK because the UK has adopted and evolved EIA in a much better way [16]. Ample evidence has been extracted from the literature depicting studies of various developed and developing countries, presenting a broader perspective related to EIA practices. These encompass studies such as "EIA in Brazil: A procedures-practice gap," a comparative analysis with European-union, particularly UK, UK and Italian EIA systems: A comparative study on management practices and performance in the construction industry," and "A comparative evaluation of EIA systems in Egypt, Turkey, and Tunisia [17]–[19]. There are existing studies that have briefly described the EIA processes being followed in both Pakistan and the UK separately [13], [20]. These studies often focus on isolated aspects of EIA rather than providing a complete proportional analysis of systems across Pakistan and the UK. The following study aims to bridge that gap by comparing the EIA frameworks in the UK and Pakistan with a major focus on evaluating the EIA processes of both countries by assessing Environmental Statement (ES) from the UK and baseline studies from Pakistan to identify the strengths and weakness of the systems to propose suitable recommendations for improvement. As per my brief knowledge, this study is one of its kind.

METHODOLOGY

Selection of Countries: Comparing EIA methods in a developed (UK) and a developing (Pakistan) country highlights opportunities for improving environmental sustainability. The selection is based on accessibility to relevant ES and EIA reports. For comparison, four reports were selected (two from each country).

Data Acquisition: The study applies Wood's model for EIA comparison and the Lee & Colley review package for ES and EIA evaluation to critically assess the EIA systems of the UK and Pakistan. Wood's model evaluates EIA systems based on 14 assessing criteria, including, environmental impact screening, legal provisions, report quality checks, scoping, public review, monitoring, mitigation, public participation, cost-benefit assessment,

system feedback, decision-making influence, and suitability to broader policies [21]. Since 1992, the Lee & Colley Review Package has been widely used as an evaluation method. This package classifies and ranks ES components from A (well-functioned) to F (very inadequate) which is based on detailed assessments [22].

The models under consideration are both globally known for their flexibility, compliance, user-friendliness, and reliability in documentation. The Lee & Colley package also provides a collation sheet for comprehensive result presentation.

UK environment statement review

A224 Walton Bridge Scheme: The Walton Bridge Scheme is situated in Surrey, on the borderline between Elm Bridge Boroughs and Spelthorne. It plays a vital role in connecting communities as it is one of five main crossing paths on the River Thames supporting both vehicular and pedestrian traffic and also serves as a significant track for emergency services. Being a part of the Thames Path and National Cycle Network, makes it an essential infrastructure for both transportation and recreation [21].

Staffordshire County Council Provision of Residual Waste Treatment Facilit: Staffordshire County Council collaborated with eight district councils and Stoke-on-Trent City Council to adopt a Zero Waste to Landfill policy. The aim is to increase the recycling and composting of municipal waste by up to 50%, along with using the existing Energy from Waste (EfW) facility in Hanford, Stoke-on-Trent. This project also included a second residual waste treatment facility (an EfW plant or an alternative technology) that was subjected to competitive tender and official assessment. The proposed facility aimed to begin around 2012-2013 to manage nearly 300,000 tons of waste per year. To further minimize costs and landfill dependency, it is also expected to take in waste from neighboring local authorities [22].

Pakistan Baseline Study

Wazirabad-Kot Sarwar Expressway: This baseline study was prepared by National Engineering Services Pakistan (NESPAC) for the National Highway Authority (NHA). The expressway starts from Wazirabad, around 2.5 km from Gujranwala, running along the Wazirabad-Pindi Bhattian Road and Chenab River. Then it reaches to Lahore-Islamabad Motorway at Kot Sarwar. The objective of this project was to foster infrastructure development and transport connectivity by refining mobility and access within the area.

Sind Irrigation & Drainage Authority Water Sector Improvement Project (WSIP-I): This study was led by M/s Osmani & Co. (Pvt.) Ltd. for the Institutional Reforms Consultant (IRC) of SIDA. In October 2006, the

Government of Sindh collaborated with the World Bank for this project. Under the proposed plan, the canal command areas were supposed to be divided into 14 Area Water Boards (AWBs). To promote decentralized governance, the management responsibilities were moved to Farmer's Organizations (FOs) and Watercourse Associations (WCAs). A key objective of this project was to further develop the nine main canals (726 km) and 37 branch canals (1,441 km) and also include fresh additional lining for 50% of Akram Wah's lined stretch. Another objective was the control of direct outlets, to upgrade the APMs by enhancing 173 distributaries and canals with geo membrane and concrete lining. A Major Plan for the Indus Delta and Coastal Zone was also a part of the project [23].

RESULTS AND DISCUSSION

The comparison of the ESs from UK and the parallel Baseline Studies of EIA in Pakistan was conducted by using the Lee and Colley (1992) Review Package. This package offers an overview of the following elements: the development description, regional surroundings, and baseline circumstances; the classification and assessment of the major affects; the alternative and the mitigative measures for these impacts; and the result reporting.

The Lee and Colley (1992) review package indicates the following key for its grades. Grades A and B show a grading of satisfaction on the basic categories of the report while C and onward are a level of less satisfaction to non-satisfaction.

Analysis of Environmental Statements UK: Analysis of Environmental Statement A224 Walton Bridge Series 2007 UK grades reveals that 72% of the categories were rated well performed and the rest 28% are generally satisfactory. So the overall assessment of the ES is rated as very well performed. In the case of Waste Treatment Facility Project W2R Staffordshire County Council 70% of the categories of the review package are rated as well performed while 24% are generally satisfactory so the overall assessment of both reports is the same, (figures 1 and 2).

All review areas in the Walton Bridge ES are rated as A and B. The most well-performed category is 'Result reporting' which has a 90 % rating at grade A, while 'Alternatives and Mitigation' is the least well performed with a 50 % rated at grade B. For the Waste Treatment Facility, the majority of the review areas were classed at grade A or B, however, there were areas less than satisfactory in the categories 'Alternatives and Mitigation' and 'Identification of key impacts'- the vast performing area- and minor omission in the other 2 categories. Again, 'Result reporting' was the well-performed category.

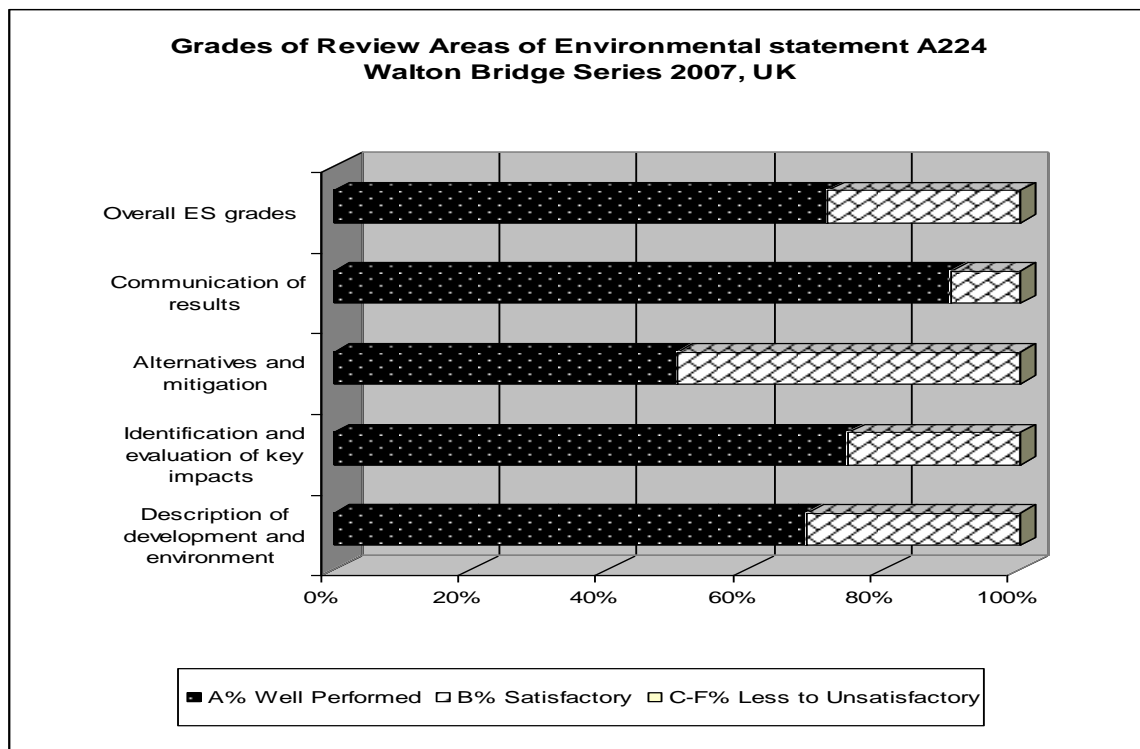


Figure 1: An illustration of the 2007 Walton Bridge series' Grades of Review for ES for A224

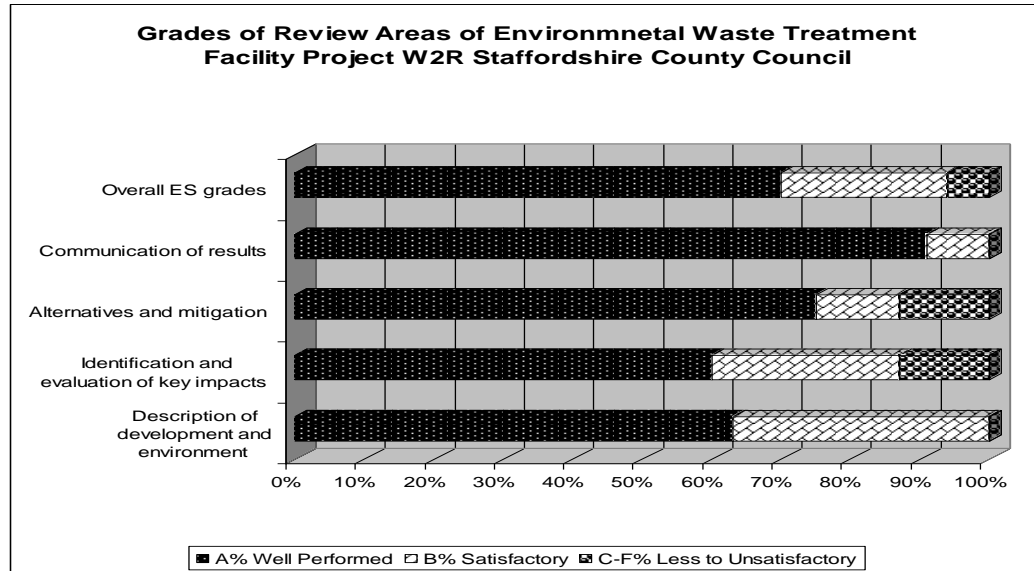


Figure 2: An illustration of the Environmental Waste Treatment Facility Project W2R Staffordshire County Council's ES Grades of Review

Analysis of overall Baseline Studies of Pakistan, grade: Analysis of overall Baseline Studies of Wazirabad-Kotsarwar Road Pakistan (figure 3), grades reveals that only 25% of the categories were rated well performed with the majority (51%) generally satisfactory and the remaining 24% falling between C and F. So the overall assessment of the ES is rated as generally satisfactory.

All the review areas have good grades but the weakest which needs improvement is 'Alternatives and Mitigation', and specifically 'mitigations' which had just 12 % rated at grade A. No category in this report could be scored 50% A, the maximum 'A' score is 30% and it is in 'Developmental description'. Most of the categories lie in grade B which was maximum at 62% at 'identification

and evaluation of the key impacts'. 'Result reporting' was rated at 54% which is also a good percentage of grade B. The overall performance of the review of the baseline study is generally satisfactory but some area of most of the aspects needs attention to be improved.

In the case of review of the baseline Water Sector Improvement Project, Sindh (figure 4), the overall grade for the 'Result reporting' was well performed. However, the treatment of 'Alternative and Mitigation' is unsatisfactory overall. 'Identification of the key impacts' and 'Description of the environment' are well performed. The overall performance of this baseline study is rated between well performed to generally satisfactory.

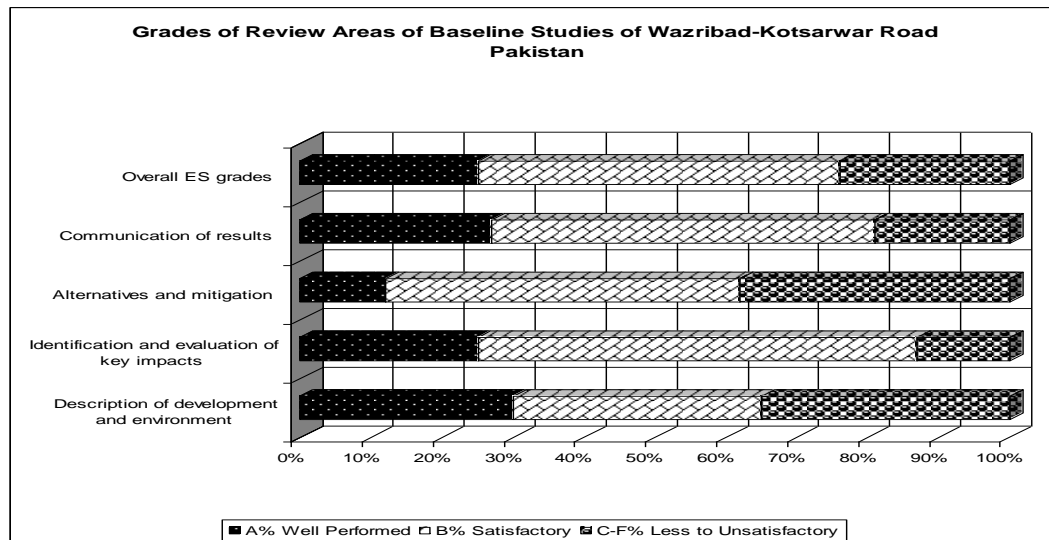


Figure 3: Wazirabad-Kotsarwar Road in Pakistan's Grades of Review of Baseline, represented graphically

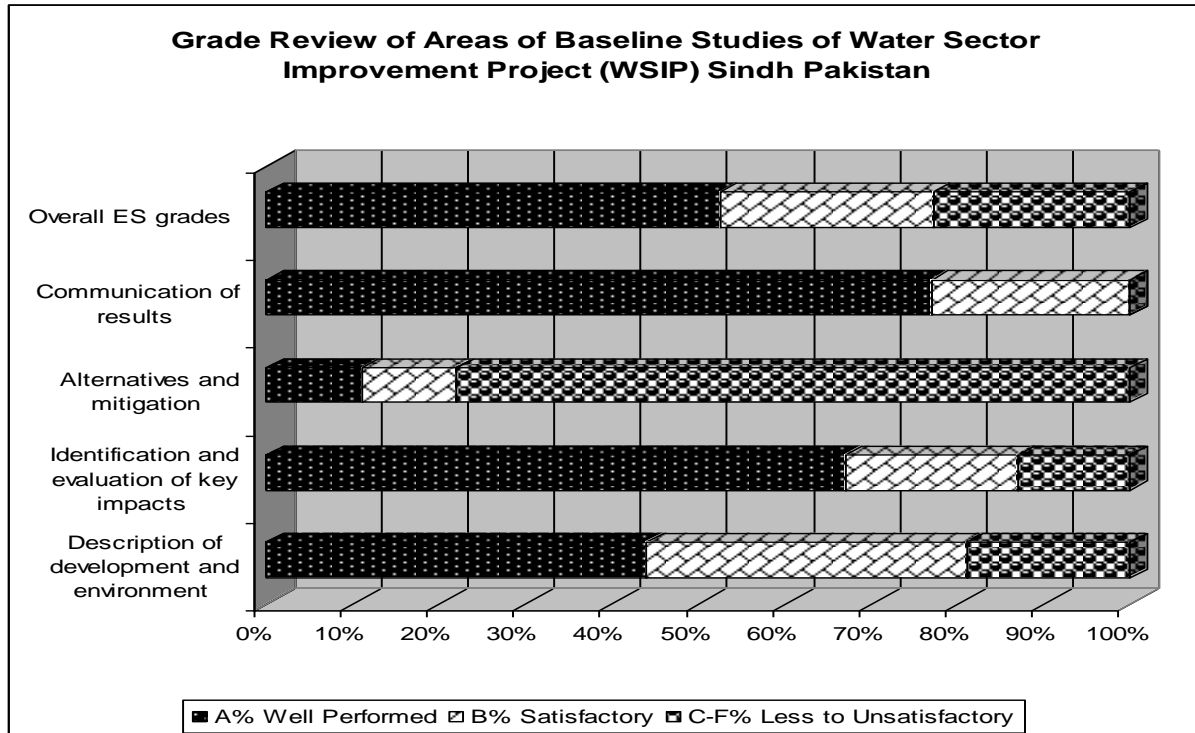


Figure 4: An illustration of the Water Sector Improvement Project (WSIP) Sind Pakistan's Grades of Review of Baseline

Evaluation of the Quality of ES and Baseline Study:

The detailed results obtained from the Lee and Colley analysis of all Environmental statements and Baseline Studies are shown in Tables 1 to 4.

Developmental description, (local environment, and the baseline conditions):

The environmental statement of the UK is a very well-performed area in both ESs. The purpose and objectives of EIA are very well mentioned in both reports; all aspects of site and development that are relevant to the area impact assessment are elaborated and rated 100% A. Only raw material quantities are not very well mentioned and their transportation on and off the site is not clear. That is why it is rated at B with 25% in both of the reports. But overall this area is covered very well. Waste types, quantities, energy, and final disposal of the waste are not mentioned it needs further improvement and is rated at 60% 'A' in ES. An existing environmental description is very well addressed in both reports rated at 100% A. A Baseline condition description in ES is addressed and rated at 100% A.

The review of baseline studies of Pakistan indicates that most of the categories are rated between generally satisfactory to just satisfactory. The development of the project in both studies is described very well. Site description is generally rated at 50% C. There is no clear indication of how the waste will be managed, transported, and disposed of, so it is also rated at C. Description of the environment is very well

attempted but methodologies of assessment are not described in the study. Hence, the overall performance lies between generally satisfactory to satisfactory.

Detection and estimation of major impacts: The waste Treatment ES of UK achieved a score of 87% graded at A/B, with the remaining 13% at 'C' or less. This was mainly due to the failure to predict and access impact significance. Both baseline studies of Pakistan achieved an overall score of 87% graded at A or B, with 13% graded at C and F. However, the Wazirabad and Kotsarwar road had the majority of review areas graded at B (62%), while the WSIP study saw 67% graded at A, and hence was of a better quality.

Alternative and Mitigations: Although the A244 ES of the UK has covered it with great detail it received the lowest score for grade A that is, 50%. Less attention is paid to the scope and efficiency of mitigation measures and least to assurance of mitigation in ES of project A244. While 'Alternatives and Mitigation' are properly addressed in Project W2R it is rated at 75% A. In the case of Pakistan, the Wazirabad-Kotsarwar Baseline study, 'Alternative and Mitigation' achieved 12% A and 50% B, with 38 % graded at C. Some improvement and further research for the selection of the best Alternatives is required. In WSIP, Alternatives are very poorly described in the report and rated at 78% C.

RESULT REPORTING

This most appropriately addressed part of all reports. All have presented maps, diagrams, photographs, graphs, tables, and annexes well. The layouts of all reports are in Chapters so it is easy to find and understand the information. The size of the Chapters is also proper in ESs while in Baseline Studies of Pakistan, it got some extra elongation. The overall performance of this section in ES is rated at 90% A and in Baseline it is 54% B.

Overall assessment of EIA in the United Kingdom and Pakistan: From Table 5, it's observed that legislative aspects for the Environmental Statement and the baseline study, are covered properly they are enlisted and then scrutinized for their compliance. Alternatives are

described for their environmental factors. All the acceptable range of alternatives is considered in the ES and Baseline study in both countries. Screening for the requirement of EIA is properly done. Scoping of the Environmental impacts to be studied is partially meeting the criteria for both the countries. There are some uncertainties in the magnitude of the impact that may occur due to the project. EIA reports are well prepared in both countries. The review of EIA reports needs some further improvements. Decision-making lacks any proper procedure for it. The report must describe the monitoring aspects of the development, environmental indicators, monitoring and sampling methods, and report for monitoring. Mitigations are properly addressed in the Environmental Statement while in the case of baseline study, they are poorly covered.

Table 1: Results summary: proportion of Assessment Symbols in different grade groupings at these review levels, overall Environmental statement A224 Walton Bridge Series 2007 review area and review category grades.

Summary of category grades		A	B	C	D-F	A%	B%	C-F%
1	Developmental description	3	1	0	0	75	25	0
2	Site description	3	2	0	0	60	30	0
3	Wastes	1	2	0	0	33	67	0
4	Description of the Environment	2	0	0	0	100	0	0
5	Baseline circumstances	2	0	0	0	100	0	0
6	Classification of all potential effects	4	1	0	0	80	20	0
7	Methods for identification of impacts	2	0	0	0	100	0	0
8	Scoping	3	0	0	0	100	0	0
9	Prediction of impact magnitude	2	1	0	0	67	33	0
10	Assessment of impact significance	1	2	0	0	33	67	0
11	Alternatives	3	0	0	0	100	0	0
12	Extent and efficacy of mitigation measures	1	2	0	0	33	67	0
13	Monitoring	0	2	0	0	0	100	0
14	Design of ES	4	0	0	0	100	0	0
15	Demonstration	2	1	0	0	67	33	0
16	Weightage	2	0	0	0	100	0	0
17	Summary	2	0	0	0	100	0	0
Summary of review area grades								
1	Description of development and environment	11	5	0	0	69	31	0
2	Detection and calculation of major impacts	12	4	0	0	75	25	0
3	Alternatives and mitigation	4	4	0	0	50	50	0
4	Result reporting	10	1	0	0	90	10	0
	Total ES grades	37	14	0	0	72	28	0

Table 2: An overview of the findings: The percentage of assessment symbols in different grade groups at these review levels, as well as the review area and category ratings for residual waste treatment facilities provided by Stafford County Council.

Summary of category grades		A	B	C	D-F	A%	B%	C-F%
1	Developmental description	2	2	0	0	50	50	0
2	Site description	3	2	0	0	60	40	0
3	Wastes	1	2	0	0	33	67	0
4	Environment description	2	0	0	0	100	0	0
5	Baseline conditions	2	0	0	0	100	0	0

6	Recognition of potential impacts	2	2	0	0	50	50	0
7	Methods for identification of impacts	2	0	0	0	100	0	0
8	Scoping	2	1	0	0	67	33	0
9	Prediction of impact magnitude	2	0	1	0	67	0	33
10	Assessment of impact significance	1	1	1	0	33	33	33
11	Alternatives	3	0	0	0	100	0	0
12	extent and efficiency of mitigation measures	1	1	1	0	33	33	33
13	Monitoring	2	0	0	0	100	0	0
14	Layout of ES	4	0	0	0	100	0	0
15	Presentation	2	1	0	0	67	33	0
16	Emphasis	2	0	0	0	100	0	0
17	Summary	2	0	0	0	100	0	0
Summary of review area grades								
1	Development and environmental description	10	6	0	0	63	37	0
2	Reporting and assessment of major impacts	9	4	2	0	60	27	13
3	Alternatives and mitigation	6	1	1	0	75	12	13
4	Reporting of results	10	1	0	0	91	9	0
	Total grades	35	12	3	0	70	24	6

Table 3: An overview of the findings: Baseline overall studies of Wazribad-Kotsarwar Road in Pakistan, proportion of Assessment Symbol in different grade groupings at these review levels, and review area and review category grades.

Summary of category grades		A	B	C	D-F	A%	B%	C-F%
1	Developmental description	3	1	0	0	75	25	0
2	Site depiction	1	1	3	0	25	25	50
3	Wastes	1	0	3	0	33	0	67
4	Description of environment	0	2	0	0	0	100	0
5	Baseline conditions	0	2	0	0	0	100	0
6	Identification of all potential impacts	2	3	0	0	40	60	0
7	Methods of impacts identification	0	2	0	0	0	100	0
8	Scoping	0	2	1	0	0	67	33
9	Expected impact magnitude	1	2	0	0	33	67	0
10	Measurement of impact significance	1	1	1	0	33	33	33
11	Alternatives	1	1	1	0	33	33	33
12	Extent and value of mitigation measures	0	1	2	0	0	33	67
13	Monitoring	0	2	0	0	0	100	0
14	Design of ES	1	3	0	0	25	75	0
15	Presentation	2	1	0	0	67	33	0
16	Emphasis		0	2	0	0	0	100
17	Summary	0	2	0	0	0	100	0
Summary of review area grades								
1	Development and environmental description	5	6	6	0	30	35	35
2	Classification and calculation of major impacts	4	10	1	0	25	62	13
3	Substitutions and mitigation	1	4	3	0	12	50	38
4	Result reporting	3	6	2	0	27	54	19
	Total ES grades	13	26	12	0	25	51	24

Table 4: Results summarized: proportion of Assessment Symbol in different grade groups at these evaluation levels, overall Baseline Studies of Water System Improvement Project (WSIP) Sind Pakistan assessment area and review category grades.

Summary of category grades		A	B	C	D-F	A%	B%	C-F%
1	Developmental description	3	0	1	0	75	0	25
2	Site description	1	3	0	1	20	60	20
3	Wastes	1	1	1	0	33	33	33

4	Environment description	0	2	0	0	0	100	0
5	Baseline conditions	2	0	0	0	100	0	0
6	Identification of all potential impacts	4	0	0	0	100	0	0
7	Systems of impact identification	2	0	0	0	100	0	0
8	Scoping	1	1	1	0	25	50	25
9	Expectation of impact magnitude	2	1	0	0	67	33	0
10	Calculation of impact significance	1	1	1	0	33	33	33
11	Alternatives	0	0	3	1	0	0	100
12	Scope and effectiveness of mitigation measures	1	1	1	0	33	33	33
13	Monitoring	0	0	2	0			100
14	Outline of ES	4	0	0	0	100	0	0
15	Presentation	2	1	0	0	67	30	0
16	Emphasis	2	1	0	0	67	0	0
17	Executive (nontechnical) summary	2	1	0	0	67	30	0
Summary of review area grades								
1	Development and environmental description	7	6	2	1	44	37	19
2	Identification and assessment of major impacts	10	3	2	0	67	20	13
3	Alternatives and mitigation	1	1	6	1	11	11	78
4	Result reporting	10	3	0	0	77	23	0
	Overall ES grades	28	13	10	2	53	25	23

Table 5: Overall assessment of EIA in the United Kingdom and Pakistan.

No	Evaluation Criterion	Criterion met Within Jurisdiction	
		United Kingdom	Pakistan
1	Legal Basis	Yes	Yes
2	Reporting	Yes	Partially
3	Alternative	Partially	Partially
4	Screening	Yes	Yes
5	Scoping	Partially	Partially
6	Report Preparation	Partially	Yes
7	Report Review	Partially	Partially
8	Decision Making	Partially	Partially
9	Impact examining	No	No
10	Mitigation	Yes	Partially
11	Consultation and participation	Partially	Yes
12	System checking	No	Partially
13	Benefits and costs	Yes	Yes
14	Planned EA	Partially	No

Conclusion: The proportional assessment of EIA processes in the UK and Pakistan emphasizes considerable differences in application. EIA is legally compulsory in both countries but in Pakistan, it is often considered as a ritual formality rather than an applicable environmental management mechanism. Although both countries have similar EIA methods and structures Pakistan strongly lacks enforcement, stakeholder commitment, and monitoring in contrast to strictly regulated compliance in the UK. Pakistan's selection standards rely seriously on project capacity, overseeing smaller projects with considerable environmental effects. Additionally, Pakistan is also facing problems like old-fashioned baseline data, inadequate staff training, and poor institutional commitment in comparison to the UK, where enforcement is ensured by structured

methodologies, impact assessment, and decision-making. This review of Environmental Statements (ES) and Baseline Studies indicates that Pakistan's baseline studies need significant improvements. To enhance its EIA performance, Pakistan must focus on strengthening key areas like alternative analysis, decision-making, enforcement, stakeholder participation, and monitoring.

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