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**Ecological Concepts in Pakistani ESL Textbooks: An Analysis of Content, Visuals, and Exercises**

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# Abstract

This study critically examines the representation of ecological themes in Pakistani ESL textbooks at the secondary level. Through qualitative content analysis of textbooks from Punjab, Sindh, and Khyber Pakhtunkhwa, the research evaluates the presence, presentation, and local relevance of ecological content using Braun and Clarke's (2006) thematic analysis framework. Findings reveal significant gaps: while terms like "pollution" and "climate change" appear sporadically, they lack depth, contextualization to Pakistan's environmental crises (e.g., Lahore's smog, water scarcity in Sindh), and pedagogical integration. Visual materials are predominantly decorative rather than instructional, missing opportunities to reinforce ecological concepts. The study concludes that current textbooks fail to foster ecological literacy or critical engagement, instead offering superficial treatments that disconnect language learning from real-world sustainability challenges. The research contributes to environmental education discourse by highlighting the marginalization of ecological content in Pakistan's ESL curriculum despite the country's extreme climate vulnerability. It proposes actionable reforms, including the localization of content with case studies, adoption of critical pedagogy approaches, and enhancement of visual materials. These recommendations aim to transform ESL textbooks into tools for ecological awareness, equipping students to address environmental issues through language education. The study underscores the need for curriculum designers and policymakers to urgently bridge this gap, aligning Pakistan's educational materials with global sustainability goals while addressing local environmental realities.

**Keywords:** Ecological Literacy, ESL Textbooks, Environmental Education, Content Analysis, Sustainability Integration, Pakistani Curriculum, Climate Change Education

**Introduction**

English dominates Pakistan's education system because it functions both as an instructional language in schools and as a key for entering universities and connecting nationally and internationally. English functions as Pakistan's official second language because it maintains essential importance for students' academic achievements, particularly within subjects including science, technology, and business (Rahman, 2007). According to the National Education Policy of Pakistan, English education serves as a priority component because it provides students with essential linguistic abilities needed to access global knowledge while also allowing participation in worldwide discussions (Government of Pakistan, 2024). English language competency produces dual benefits for academic achievement while creating access to advanced occupational potential in modern global markets. Although English plays a widely recognized central role in Pakistan's education system, there exists an essential deficiency within the curriculum by lacking environmental education content. Pakistan faces multiple critical environmental challenges consisting of declining forests alongside limited water resources, deteriorating air quality, and advancing climate change susceptibilities. Official statistics from German watch place Pakistan within the ten most climate-disaster-impacted nations worldwide based on their Climate Risk Index 2021 assessment (Eckstein, Kunzel and Schafer, 2021). Environmental issues receive minimal attention in English as a Second Language (ESL) textbooks while language instruction dominates the curricular content. As noted by Ishaque, Sultan, and Rehman (2024), Pakistan is one of the most water-stressed countries in the world, with per capita availability of water declining to below 1,000 cubic meters annually, a threshold considered as "water-scarce." In parallel, air pollution in cities like Lahore and Karachi has risen to hazardous levels, accounting for over 128,000 premature deaths each year (Iqbal, 2024). In the face of this alarming reality, most ESL textbooks seldom address even the most basic ecological issues, such as water conservation or air quality management. This omission contrasts with a worldwide epistemic shift toward sustainability education, as seen in Sweden, where environmental literacy has become integrated into curricula (Argento et al., 2020). Such a disregard for critical issues denies Pakistani ESL textbooks the ability to engage students with the challenges they face in the real world and continues the cycle of environmental oblivion. Also, ESL textbooks' neglect of environmental content represents a critical failure to mould student awareness about environmental issues in a country that makes sustainability essential to its future. Students will develop analytical skills regarding ecological matters through the integration of environmental education into their language instruction (Asgher, Saleem, and Ilyas, 2021). Therefore, Pakistan must integrate the United Nations' Sustainable Development Goals (SDGs) into educational materials, including English as a Second Language textbooks, to build student ecological consciousness while countries worldwide build program alignment with SDGs. This qualitative study investigates textual content as well as images and activities while evaluating their connection to Pakistan's natural environment. The research will examine how effectively textbooks support global environmental literacy goals through their approach to student subject matter and development of sustainable development consciousness. Worldwide scholarly literature supports the crucial position of environmental education in academic curriculum. There are findings from Yu, Guo, and Fu (2024) showing language education helps solve worldwide issues by teaching sustainability principles and global protection in textbooks.

**Research Objectives**

To analyze how ecological content is presented through textual content, visuals, and exercises

## Research Question

What sort of ecological concepts do Pakistani ESL textbooks address and how do the Pakistani ESL textbooks present the ecological concepts through content descriptions and visuals together with exercises?

## Problem Statement

Pakistan's environmental situation is not a matter of a few years; rather, it has become one of the most serious situations ever faced. Water resources are rapidly declining, rampant deforestation, and air pollution levels rated among the worst in the world (Sheikh, 2024). These challenges have socio-economic undercurrents, affecting marginalised communities even more and perpetuating poverty and inequality. Unfortunately, despite the immediacy of these matters, they are massively neglected by the education system of Pakistan, especially in the ESL—English as a Second Language—curriculum. Eco-content is almost entirely absent from ESL textbooks, which instead offer obsolete and basic instructions of the language, emphasising grammar and vocabulary skills while ignoring critical thinking and real-world application (Fareed, Ashraf, and Bilal, 2016). The omission of these themes from ESL textbooks is, therefore, highly unfortunate in educational terms as a potential avenue to mitigate environmental threats. The need for environmental education to promote environmental literacy and sustainable development is increasingly being recognised. For instance, one of the principles of UNESCO’s Education for Sustainable Development (ESD) framework is that environmental issues should be integrated into all levels of education, thus enabling learners to act in favour of ecological sustainability (UNESCO, 2021). In contrast, Pakistan has not made that transition in ESL textbooks. Amjad, Binth e Zia, and Masood (2022) reported only a small proportion of the content in ESL textbooks used in Pakistan is about the environment. The authors further added that the included text tends to be trivial, lacking any relevant engagement with Pakistan's specific ecological challenges.

## Significance of the study

This study establishes essential linkages between Pakistan's educational resources with language requirements and environmental needs. Through its examination of ecological gaps in ESL textbooks, this study dreams about how language education could step beyond its standard boundaries to serve as a framework to instruct learners about ecology. The analysis evaluates the effectiveness of ESL textbooks at promoting sustainable development and environmental consciousness while presenting developers and educators with concrete steps to teach environmental themes within language education. The study investigates language learning's connection to ecological education to establish fundamental changes in curricula that develop both linguistic abilities and environmental preparedness for worldwide sustainability challenges. The research demonstrates the requirement for interdisciplinary education that joins language instruction with environmental knowledge by illustrating how textbooks need redesigning to develop worldwide responsible citizens. This unique contribution to educational discourse paves the way to expanded environmental education research that explores multiple subjects and educational settings in Pakistan. This investigation supports an educational approach that allows students to tackle meaningful challenges involving language learning and ecological problems.

## Literature Review

## Definition and Importance of Environmental Education

Environmental Education (EE) is the comprehensive study of an ecosystem to foster ecological literacy and sustainable development. Through EE, people are equipped with the knowledge, skills, and values to understand and confront complex environmental problems. Such liveliness has already been reflected in the UNESCO (2021) definition, which states that EE should not be about just informing but developing critical thinking, problem-solving and responsibility behavior toward the environment. EE further corresponds with the United Nations Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education) and SDG 13, Climate Action, which provide an avenue for integrating sustainability across global education systems. The real worth of EE is its ability to narrow the gap between awareness and action. According to Stibbe (2012), environmental education may be the key to critical approaches toward ecological issues as it gives an opportunity to the individual to transform passive knowledge into active participation in sustainable efforts. But the extent to which EE proves to be effective is largely dependent upon incorporating it into formal educational systems, more specifically into the curricula and textbooks. For instance, Cates (1997) articulates the role of language education in global issues, advocating that ESL textbooks can be potential tools for lacing ecological issues into language learning. There are great challenges to EE, such as the lack of training of instructors, insufficient resources, and inadequate policy support, especially in most developing countries like Pakistan (Amjad et al., 2022). The UNESCO Education for Sustainable Development (ESD) at a global level provides a strong basis for EE; however, its implementation varies largely based on context. For developed countries, EE is frequently integrated into curricula through interdisciplinary approaches, while in developing ones, it is marginalized by competing educational interests and limited resources (Kioupi and Voulvoulis, 2019). Such differences urge the necessity for context-specific approaches that respond to local environmental problems within the framework of global sustainability.

### Global Trends in Environmental Education

The incorporation of environmental education (EE) in formal curricula has received huge momentum across the world due to the Sustainable Development Goals (SDGs) of the United Nations. Countries such as Sweden, Finland, and Japan lead the way in incorporating sustainability into education systems through interdisciplinary approaches that link learning languages and eco-literacy. For example, experiential learning has been introduced in Sweden, which has left students engaging in 'doing' activities such as recycling projects and nature excursions (Ramish, Shaikh and Zahra, 2024). On similar lines, Finland has implemented the Content and Language Integrated Learning (CLIL) approach in integrating language education with ecological issues to gain proficiency in languages and develop environmental awareness among students (Sudarso, Globalisasi and Dibdyaningsih, 2024). These illustrate how the world shifts toward sustainability education, where language education gradually becomes a tool for fostering ecological literacy and global citizenship. Much research has been done on sustainability issues in English language education after the year 2020, according to the study of Zaimoğlu (2024), but the researchers do not seem to have equally spread their focus geographically. The bibliometric analysis has some countries like China, the USA, and the Czech Republic reigning in the research field with the alone contribution of China at 322 publications. It implies that developing countries are lagging behind, whereby some regions are taking bigger steps toward integrating sustainability into language education. This finding resonates with general criticism that global sustainability education simply incorporates common universal themes, such as climate change, and ignores site-specific environment problems (Amjad et al., 2022). In Pakistan, for example, ESL textbooks are severely lacked in ecological issues despite great environmental problems like deforestation and scarcity of water (Fareed et al, 2016). The study of Liu et al. (2024) on the English textbooks used in Chinese universities also supports the fact that while countries are integrating environmental themes in their language education, the initiatives are not always in harmony with one another. Through dissertation analysis on 12 series of textbooks on these topics, important environment-related semantic domains such as 'Green issues' and 'Science and technology' were all apparent; however, the depth and dimensions of critical engagement by the students with these topics were quite different from each other. This contrasts to the Finnish model, in which the main part of the curriculum is sustainability, and students are encouraged to think critically about ecological issues, according to Messina (2023). In addition, it has found a scarcity of evidence regarding effectiveness of educational materials from a Chinese point of view, which resonates well with the findings of Zaimoğlu (2024) that call for more diverse and inclusive studies that take different cultural and linguistic contexts into consideration. The comparative perspective provided by Zguir, Dubis, and Koç (2021) has further strengthened the knowledge of global trends in integrating education for sustainable development (ESD) and SDGs into the educational landscapes of Qatar, Singapore, and New Zealand. Singapore has actively integrated ESD alongside other early childhood curricula and outdoor learning, while New Zealand emphasises ecological literacy through programmes such as Enviroschools. For Qatar, a long list of challenges persists; among them are the lack of concrete guidance for ESD, initial teacher-training programmes, and assessment tools. However, Qatar has made some strides toward integrating the SDGs into its curriculum and educational planning as part of its 2030 National Vision (Zguir, Dubis, and Koç, 2021). The variance highlights that sustainability education has not seen an equitable ground of realisation throughout the world; while some countries have excelled in embedding ESD, others struggle just to get past a very serious hindrance on the administrative and pedagogical front.

**Lack of Integration of Environmental Themes in Educational Materials**

The whole application of the environment to educational concerns, especially in developing countries such as Pakistan, has placed real research tests on the learners. In spite of a global transformation towards sustainability education as evidenced in Sweden and Finland, where environmental literacy is heavily embedded in the curricula (Argento et al., 2020), Pakistan's educational system still lags behind. More so, the gap is prevalent in English as a Second Language (ESL) textbooks, which cover predominantly the landscape but have no ecological content, while the nation is going through extreme environmental crises such as deforestation, water scarcity, and air pollution (Eckstein, Kunzel, & Schafer, 2021). This does most material fail in associating education with the urgent ecological challenges of the 21st century.This is due to the defective curriculum of the education system, which is reported as a major barrier in the way of environmental education in Pakistan (Ashfaq&Mujtaba, 2016). Although the Single National Curriculum (SNC) of Pakistan includes environmental matters such as pollution and conservation, they are treated insignificantly with very little reference to critical areas like climate change and loss of biodiversity. Most environmental issues are tightly confined under general science and geography and, to a large extent, neglect other subjects such as English, added Ashfaq&Mujtaba (2016). Such an approach denies the opportunity for interdisciplinary learning, critical to the personal ecological literacy development of learners. In addition, no very proper direction is given to the sustainability teaching itself within the new framework of course studies and does not correspond with the global sustainability pillars such as the United Nations' Sustainable Development Goals, especially related to SDG 13 (Climate Action) and SDG 15 (Life on Land).Additionally affecting the issue is inadequate teacher training. Most of the teachers have no knowledge or skill to merge environmental issues into their lessons, especially in ESL contexts (Gugssa, 2024). Thus, inadequate policy support for environmental education worsened the case because, even though the National Education Policy (NEP) of Pakistan insists that environmental education is important, this commitment does not materialise in the curriculum or allocation of resources. Consequently, environmental education remains project-based and short-lived, supported within institutions for the integration of ecology into nascent mainstream education.Considering the influence language education holds in promoting ecological consciousness, the absence of environmental issues in ESL textbooks seems rather disturbing. Language education is acknowledged in many parts of the world for its potential for targeting environmental issues, and research shows that 'adding sustainability principles to the language curriculum can raise students' ecological literacy' (Davariet al., 2025). In Pakistan, however, ESL textbooks focus mainly on grammar and vocabulary while almost ignoring real environmental concerns. Such a partly redundant approach has reduced the learners' potential to develop thinking and problem-solving skills while also ensuring the perpetuation of environmental ignorance and inaction.

**Role of ESL Textbooks in Pakistan**

The ESL textbooks in Pakistan are among the primary tools for language learning and beyond. They help shape students' worldviews, critical thinking, and awareness of global and local issues. However, from the available literature, it can be inferred that textbooks lack sufficient concern for environmental content that affects students' environmental consciousness and, consequently, Pakistan's ability to meet its sustainability goals. Shah (2024) elaborates on how ESL textbooks could integrate interdisciplinary issues such as environmental games into language learning. The author presents an argument that textbooks could act as a bridge between language studies and real ecological issues, thereby nurturing ecological literacy along with linguistic competence, one that remains practically neglected on the ground in Pakistan. While such accomplishments have been realised in Finland and Sweden, with sustainability firmly entrenched into the language syllabus, Pakistani ESL textbooks continue to deal narrowly with grammar and vocabulary, already distancing students from ecological-related themes (Hult, 2012). Yu, Guo, and Fu argued, in their study (2024), for a further integration of environmental issues into the ESL syllabus so as to enhance sustainable values in students of that trade. In Pakistan, this integration does not happen, so that students are unprepared to act on the environmental concerns they are facing. For example, while Pakistan remains one of the most water-stressed countries in the world, ESL textbooks say absolutely nothing about water conservation and sustainable resource management.

## Ecological Themes in ESL Textbooks

**Sustainability and Conservation**

As critical issues of environmental education, sustainability and conservation are not all that well included in ESL textbooks within Pakistan. While there are countries like Sweden, Finland, and Japan that teach sustainability within their language curricula and hence promote ecological literacy as well as language learning under it. For example, students learn to recycle and go on nature tours in Sweden's experiential learning curriculum, whereas Finland does CLIL, or Content and Language Integrated Learning, where issues that concern the environment are taught in close combination with language learning and teaching (Zguir, Dubis and Koç, 2021). Such activities have not only improved learners in the concept of sustainability but also engaged them deeply in environmental conservation. In comparison, Pakistani ESL textbooks have very little mention of the themes of sustainability and conservation. A typical finding is the one by Jamil et al. (2024), in which English textbooks for Grade XII in Pakistan showed that environmental sustainability was hardly addressed in the texts. Here, most topics or issues were tangentially referred to, for example, population growth and resource strain. The absence of such explicit content about sustainability and conservation is particularly telling, given the reality of severe environmental challenges facing the country, including deforestation, water scarcity, and biodiversity loss. Not having them in the ESL textbooks leaves a gap for students, and therefore it cannot be meaningful for equipping them to deal with some of these most pressing issues.

### Pollution and Climate Change

On a global scale, pollution and climate change are some of the prominent environmental issues, but their representation within ESL textbooks in Pakistan is quite negligible. On the contrary, certain nations have begun the inculcation of these topics in the educational materials of their countries. In China, for example, university textbooks contain domains like "Green Issues" and "Science and Technology," although the degree of deliberation varies (Liu et al., 2021). Likewise, ecologically related critical thinking is facilitated in Finnish textbooks, which connects global climate change with local environmental challenges. In Pakistan, however, ESL textbooks hardly pay attention to pollution and climate change, even though the country is subject to their adverse impact. Besides, air pollution, air-quality management and health aspects of pollution are not discussed meaningfully in ESL textbooks. Likewise, other than mentioning the fact that Pakistan is one of the countries worst affected by climate change, newly rising temperatures and glacial melt threaten water security, with very few climate-related issues being highlighted in the educational material (Khanum, 2019). This gap requires that Pakistani ESL textbooks include topics linking global climate change with local realities. For instance, lessons could survey the socio-economical implications of glacial melting in Gilgit-Baltistan or the health impacts of smog in Lahore. By serving as a window into the experience of Pakistan, textbooks might make ecological ideas more relatable and doable at the student level. This will ensure not only that students are cognisant of climate change but also that they are equipped with the knowledge to contribute to the local solution.

**Visual and Exercise-Based Learning**

Visual and exercise-based learning promotes ecological literacy, which attracts students' attention to hands-on and interactive approaches. Across the globe, several countries have been successful in using visuals and exercises to impart environmental knowledge. For instance, Swedish textbooks often use pictures of nature and recycling systems with activities that prompt students to think about their behaviours and impacts on the environment (Rosenlundet al., 2025). Finnish textbooks similarly use visuals to illustrate how ecological systems are interlinked for a wider understanding of sustainability (Mykrä, 2023). In Pakistan, however, ESL textbooks on ecological themes cannot establish their goals through efficient visual and exercise-based content. Some texts contained pictures, which were rather decorative than educational to impart meaningful environmental concepts. Exercises are often solely concerned with grammar and vocabulary, hardly touching socio-environmental critical thinking or problem-solving (Khanum, 2019). Thus, they do a poor job of fostering students' ability to hone skills to cope with environmental challenges. This calls for visual and exercise-based content on a more efficient scale in Pakistani ESL textbooks. For example, visuals can highlight local environmental problems, such as those from deforestation in the Margalla Hills or water scarcity in Thar, and exercises would require students to recommend solutions. Also worth applying are activities such as role-play simulations of environmental decision-making or project-based tasks that involve drawing up a water conservation plan for their school (Rumore, Schenk and Susskind, 2016). This will contribute to ecological literacy and make the process of learning the language exciting and connected to students' lives. In conclusion, while global best practices offer valuable insights into integrating ecological themes into ESL textbooks, Pakistan's educational materials remain largely disconnected from these trends. By incorporating sustainability, conservation, pollution, and climate change into ESL curricula, and by leveraging visual and exercise-based learning, Pakistan can equip students with the knowledge and skills needed to address its environmental challenges. This would not only align the country's education system with global sustainability goals but also foster a generation of environmentally conscious citizens.

**Theoretical Framework**

The three frameworks being used in this study are, namely, ecological linguistics, critical pedagogy, and content and language integrated learning (CLIL). They were employed for analyzing ecological themes in Pakistani ESL textbooks.

### Ecological Linguistics

Ecological linguistics is about how things to do with language and the environment relate, especially in terms of how that determines ecology values and attitudes toward ecology. For example, Harrison (2023) argues that language is a medium used usually for the creation and transmission of environmental knowledge. It is also relevant to ESL textbooks, as it asserts that language education has the potential to make people ecologically conscious. This shows the incorporation of ecological vocabulary and narratives into texts that helps students understand environmental problems. Pakistani ESL textbooks, however, do not have such content or substance (Hindujaet al., 2023). That is a lost opportunity as using language education to help promote ecological advocacy. Therefore, ecological linguistics becomes a critical lens for analyzing and improving ecological content in ESL materials.

### Critical Pedagogy

Critical Pedagogy, derived from the works of Paulo Freire (1970), considers education as a vehicle for social transformation, enabling students to critically interrogate the societal issues in which they live and challenge the systems of oppression (Chalaune, 2021). In environmental education, this enables learners to interrogate the lack of sustainability of specific practices and instead propose ecological justice. ESL texts, for instance, could include critical discussions of pollution and climate change, thereby promoting agency and active engagement in environmental stewardship.

### Content and Language Integrated Learning (CLIL)

In this context, CLIL deals with the incorporation into language instruction of subject area content-specific knowledge (Dalton-Puffer, 2011). In this way, it deepens the actual learning of a foreign language and makes eco-literacy part of the common experience. For instance, the Finnish CLIL model successfully integrates English-language learning and education in sustainability. In Pakistan, CLIL could be molded into ecologically centric themes in ESL books so that children learn English through sustainability approaches. This has great practical value in the context of the study on improving ecological content in language learning. These all were employed to inform the research design and analysis. Ecological linguistics recognizes the role of language in making an ecological approach. On the other hand, critical pedagogy addresses the aspect of empowerment such that the students will be able to make sense of the interplay of ecology and other factors affecting the student. CLIL offers a real benefit in bringing ecological content into the internalization of a language. All these align with the study's objective of gauging Pakistani ESL textbooks on ecological content and coming up with points of improvement.

**Methodology**

## Research Approach

## This study employs an inductive mode of research that focuses on allowing rather than assuming ecological themes to come out naturally from analyzing Pakistani ESL textbooks (Kim, 2021). This bottom-up approach highly suited the exploratory nature of this study, as it enables open-ended probes into how environmental concepts are conveyed through textual content, visuals, and exercises. The inductive method fits very well into the interpretivist philosophies upon which the study is based, which again emphasizes the context of the subjective construction of meaning.

**Research Strategy**

The research employs qualitative content analysis as the primary research method to examine ecological themes in Pakistani secondary school ESL textbooks. This method was chosen for its thorough yet flexible mechanism for analyzing visual, textual, and exercise elements of educational materials (Maier, 2024). Specifically for this investigation, content analysis results in two advantages: it allowed for the manifest examination of visible environmental content and, by latent conventions, the interpretation of the underlying themes and messages.

**Research Choice**

This study employs a mono-method qualitative research design, utilizing thematic analysis of existing Pakistani secondary-level ESL textbooks. The decision to adopt this approach was guided by the study's epistemological alignment with interpretivism, the nature of the research questions, and practical considerations regarding scope and feasibility. By focusing exclusively on qualitative analysis of secondary data, the research maintains methodological coherence while ensuring the findings remain directly relevant to curriculum evaluation and textbook development.

**Time Horizon**

The study employs a cross-sectional time horizon, analyzing textbook materials for teaching English as a second language at a secondary level across one contemporary period (Wang and Cheng, 2020). This indicates a narrowed consideration of the current integration of ecological content in language teaching materials in almost a snapshot of actual curriculum activities. With its focus on textbooks that saw use during the course of the 2023-2024 academic years, fresh representations of environmental topics would be running down the research runway towards present educational policymakers and curriculum developers.

## Sampling

This study used purposive sampling to examine Pakistani secondary-level ESL textbooks, a selection of five textbooks considered key as representing major regional educational boards and private publishers. The sampling strategy was framed to ensure the inclusion within the study of materials helpful in clarifying some paradigms of how ecological content is integrated within various curricula, along with being within a manageable scope for a planned in-depth qualitative study (Campbell et al., 2020).

## Data Collection

The research adopts a fully manual analysis of Pakistani secondary ESL textbooks and strives to cover three domains of the content: textual materials, visual elements, and exercise components. Textual analysis covers lessons, reading passages, and dialogues to find direct and indirect references related to ecological themes such as conservation, pollution, and climate change. Analyzing visual materials, including photographs, illustrations, and diagrams, was done to find their representation of environmental issues and sustainability concepts. The last but not least part of this study is a systematic review of exercise sections in order to see to what extent the activities engage students with ecological content through vocabulary practice, comprehension questions, and critical thinking.

**Data Analysis**

The present analysis systematically reviews six phases for the thematic analysis framework by Braun and Clarke (2006) towards ecological content in ESL textbooks used in Pakistani secondary classes.

Phase 1: Familiarisation

Reading, viewing and absorbing all selected textbooks has become an analytical preparatory stage. They recount precise readings, each with a repeated reading of closely examining and initial observations about ecological contents in margins. It fulfils three important functions: (1) the complete understanding of the organisation of structure and content in each textbook, (2) identifying apparent environmental references, and (3) reading less apparent connections between language learning objectives and ecological themes.

Phase 2: Preliminary Coding

After familiarisation with the various literatures, researchers systematically engage in manual coding with coloured pens and annotation systems to indicate and classify the environmental content. Textual units are ascribable to explicit terms (like "deforestation" and "carbon footprint") or to direct allusions without mentioning particular terms (for instance, passages about farming intimating land use issues). Descriptive codes capturing both denotative elements ("polluted river image") and connotative meanings ("human-nature conflict symbolism") apply to visual material. These are also coded by type (vocabulary, comprehension, critical thinking) and by how they engage with environmental concepts in exercises.

Phase 3: Codes Into Themes

Synthesising codes into themes was performed by iterative comparison and grouping. This entire process results in a theme map that displays the relationship between codes and patterns of broader consequence. For example, codes "examples of water scarcity", "accounts of drought", and "how to save water" may be part of a bigger theme titled "Challenges with Water Resources".

Phase 4: Reviewing Themes and Refining Them

At the point where all the coded extracts fit within themes, then the themes should be distinct but related. The researcher re-evaluated the textbook with definitions of the theme in mind and made changes where more borders and names need to be adjusted. For example, the theme "Climate Change" may be distilled into "Global Climate Impacts" and "Local Climate Vulnerabilities", recognising that the two aspects are treated differently across textbooks.

Phase 5: Identifying and Naming Themes

Each theme included a well-formed written description defining its attributes and making it clear what that particular theme represents. They also construct narrative explanations of how themes relate to one another and the research question, thus creating a coherent analytical framework.

Phase 6: Reporting

The findings were richly descriptive, and then they were supplemented with concrete examples from textbooks. Direct quotes, visual reproductions (with permissions), and exercise descriptions would be the evidence for each theme. The report explicitly showed how the themes respond to the research questions while holding a transparent analytic process through an audit trail documenting coding decisions.

# Thematic Analysis

The analysis categorizes ecological content into four themes: pollution, conservation, climate change, and sustainability practices. It evaluates textual and visual materials for depth, local relevance, and pedagogical effectiveness.

**Table 4.1**

## Textual Analysis

|  |  |
| --- | --- |
| Theme | Associated Codes |
| 1.Pollution and Health Hazards | smog, smoke, factories, traffic, vehicles, health, breathing, air quality, garbage, littering, diseases, respiratory, clean air, dust, garbage piles, unclean air, dirt, dust, contaminated water, health problems, diseases, waste disposal, sanitation, |
| 2. Natural Resources and Conservation | trees, forest, greenery, water, rivers, lakes, deforestation, animals, nature, biodiversity, protect, plantation, flora, fauna, trees, forests, River Indus, wildlife, protect, preserve, biodiversity, planting, animals, natural beauty, habitat, arable land, irrigation, groundwater, dams, reservoirs |
| 3. Climate Change and Environmental Crisis | climate, rising temperature, global warming, flood, heat waves, glaciers, drought, food shortage, storms, sea level, melting, environment, extreme weather, floods, droughts, heat waves, global warming, temperature rise, environmental damage, drought, flood, extreme weather, Anthropocene epoch, carrying capacity of earth, water stress |
| 4. Daily Sustainability Practices | recycle, reuse, save water, turn off lights, pick up litter, no plastic, compost, reduce, eco-friendly, paper bags, waste bins, awareness, recycle, save water, turn off lights, avoid plastic, clean surroundings, plant trees, reduce waste, reduce waste, plant trees, efficient crops, drip irrigation, recycling, judicious resource use, melting glaciers |

### Pollution and Health Hazards

For understanding passages and lists of vocabulary, the standard ESL textbook in Punjab uses smoke, dust, factories and vehicles. In one lesson, the focus is on pollution and it briefly covers being clean and sharing interest in how cars release smoke and how garbage accumulates. However, these significant points are usually not explored in detail in the book. The paper names hazards such as respiratory problems and unclean air, yet it does not explain how these hazards affect the students of Faisalabad and Lahore during smog-related sessions. Although the exercises in the material require filling or matching blanks and definitions, they do not provide opportunities for critical thinking or suggestions for solving pollution issues. Since the lesson lacks examples and interactive assignments, students would not see how the terminology can be used in real life. The book on Pakistani education does not highlight the serious environmental problems faced by Punjab’s urban communities. Since English textbooks are not designed to reflect local conditions, there has been no connection made between environmental awareness and health education. This unit in the Sindh textbook focuses on pollution by mentioning mountains of garbage, along with dirty air and the environment, all of which endanger safety in urban areas. Community responsibility is the main topic, but the book does not talk about the major issues of industrial pollution and car emissions which pose serious problems in Karachi and Hyderabad. Water contamination is mentioned in the educational materials, yet there is no mention of how industrial waste in factories causes the major pollution of the Indus River in Sindh. Statistics and case studies from the book give an explanation of how the smog in Lahore is responsible for respiratory diseases found in the Class X curriculum. The Sindh book discusses health dangers in Unit 2 (Labour and People’s Rights) through a statement that connects clean environments with human dignity by overlooking illness connections between pollution and diseases. Students perform Formal Email Writing (Unit 2.4) by writing complaints about local pollution, although the provided prompts lack real-world specificity. The health-friendly measures adopted by Punjab represent a step forward by introducing simulated doctor interviews about patients affected by smog. The textbook in Sindh province should incorporate Punjab's localised example approach by using Karachi's air quality index data while implementing language skills training. For instance, the social media lesson in Unit 4 might examine viral campaigns such as #KarachiSmog, combining digital literacy with environmental consciousness. The KPK textbook recognises pollution by outlining terminology, including garbage-mound and air pollutants and industrial waste, e.g., in Unit 4 Science textbooks show how population growth directly impacts environmental conditions (Unit 4: Population Growth and its Impact on Environment). The curriculum demonstrates direct connections between pollution and associated health problems (catastrophic illnesses from contaminated water) alongside urban difficulties (forced population migration from forest loss). The content mainly focuses on problem identification rather than presenting concrete solutions to the described environmental challenges. KPK textbooks present wider scientific explanations, like greenhouse gases, while they lack the localised context, like that of Lahore's smog crisis, found in Punjab’s content. The NBF textbook for Grade 11 approaches pollution through a sanitised, globalised lens, primarily framing it as a challenge of water sanitation and hygiene. Terms like wastewater treatment and safe drinking water appear frequently, tied to SDG targets, but the discussion remains abstract. For instance, while the text cites statistics like 703 million lacking basic water services, it avoids naming local culprits (e.g., industrial effluents in the Ravi River) or contextualising disparities (e.g., how urban elites access filtered water while rural communities drink arsenic-contaminated groundwater). The health impacts of pollution are reduced to clinical terms (diarrhoea-related deaths), stripping away human stories. Exercises demand rote descriptions (explain the effects of unclean water) rather than critical engagement (why do factories near settlements violate environmental laws?). This reflects a neoliberal bias—individualising responsibility (handwashing) while omitting systemic actors (e.g., Punjab’s smog policies favouring crop-burning farmers). In the Oxford Progressive English books, references to pollution are present but sporadic. Terms such as poison, pollution, and factory smoke are found mostly in the context of vocabulary activities or comprehension passages. For example, in Book 9, students examine headlines like Poisonous Pollution to Blame for Fish Disaster, which draws some attention to the impact of pollution on marine ecosystems. The story involving a snake’s venom (Unit 1) indirectly links to health risks and medicine, offering opportunities to discuss environmental toxins. However, the connection to local Pakistani contexts—such as urban smog in Lahore or plastic waste in rivers—is notably absent. While the use of health and pollution-related vocabulary is commendable, it often lacks depth, real-life application, and follow-up discussions that prompt critical thinking or student reflection. Activities are often more reading-focused, without encouraging students to form opinions or suggest solutions. Therefore, the theme is introduced but underdeveloped in fostering awareness or behavioral change.

### Natural Resources and Conservation

The Punjab ESL textbook sometimes uses terms like trees, forest, rivers, and animals inside descriptive passages and moral stories throughout its pages. The Plant a Tree Save a Life story teaches readers to value nature but does not explore Pakistan's deforestation problems or biodiversity matters. Learners encounter plant more trees statements throughout the lessons, yet these statements do not establish specific local environmental issues such as Khyber Pakhtunkhwa's forest decline and Lahore's tree eradication programmes. The visuals show some greenery pictures and gardens, although wildlife from forests remains absent. The book creates opportunities to educate readers about river conservation, such as the Indus and endangered species in Pakistan. The word protect appears throughout the book, yet it does not associate with ecological protection; instead, it focuses on protective measures for well-being and family safety. Students fail to develop strong conservation attitudes because of this absence. The concepts appear individually rather than presenting them as part of an all-encompassing environmental storyline. This theme functions as a moral lesson despite its absence from ecological necessities in Pakistani contexts while remaining disconnected from actual environmental conditions throughout the country. The sections in Unit 7 titled Praising Nature present descriptions of Sindh's natural scenery, including both Gorakh Hills and the Indus River. The book presents conservation through an aesthetic lens rather than pursuing necessary remedial work. The travel diary in Unit 7.1 mentions clean fields and refreshing air, but it fails to mention dangers such as forestry decline or scarcity of water resources. Scarcity and environmental dangers which impact Punjab are discussed in the deforestation chapters about Murree. Environmental care receives metaphorical treatment within the poem Little Things (Unit 3) through its use of the analogy regarding water droplets forming an ocean. Despite metaphorical references to the power of collaboration (little drops forming the great ocean), the approach lacks concrete methods to help the Indus Delta. Punjab’s textbooks present assignments to measure your personal water footprint, which establishes a direct link between personal conduct and environmental crises. One of Sindh's five educational units (Respecting Self and Others) should embed lessons about environmental protection. The lesson should promote conservation principles by showing how litter damages public resources which belong to all members of society. Instead, its focus is abstract, e.g., bad dreams. Unit 6's Character Building segment offers a missed opportunity to develop a meaningful connection between moral duties and ecological citizenship. Moral obligations toward eco-citizenship particularly require eco-protecting trees as part of civic culture. The terms forests, along with arable land and groundwater depletion, appear in Unit 10: Water Scarcity in Pakistan, highlighting resource management. The book devotes attention to Pakistan's worsening water situation in the Indus Basin region. The annual loss of 18 million acres of forest persists simultaneously with the water crisis caused by the Indus Basin River. Unlike Sindh’s books, which romanticise Sindh's lush plains through natural descriptions, the teachings in KPK prefer scientific terminology (e.g., biodiversity loss). However, they do not mention KPK’s own efforts towards sustainability and deforestation. According to NBF’s Book for grade 11, water scarcity dominates this theme, with technical vocabulary (aquifers, transboundary basins) borrowed from international development discourse. The text’s emphasis on sustainable withdrawals and ecosystem restoration feels performative, as it never names Pakistan’s specific crises: the Indus Delta’s erosion due to dams or Islamabad’s deforestation for housing schemes. The unit’s mind-mapping activity (summarise water-use efficiency) prioritisesmemorisation over critique (e.g., who benefits from mismanaged water treaties?). Notably, biodiversity is mentioned only in passing, with no reference to endemic species loss (e.g., the Indus blind dolphin) or the military’s role in seizing forest land. The textbook’s conservation narrative is depoliticised—celebrating global progress while ignoring local land-rights movements (e.g., Sindh’s fisherfolk resisting mangrove destruction). This theme is one of the stronger areas in the ESL textbooks. In Book 10 by Oxford, Unit 5 titled Trees introduces key terms like forest, biodiversity, protect, and natural resources. It encourages students to think about the importance of trees and forests, which is a good entry point for discussing conservation. Additionally, Unit 8, In the Wild, uses words like endangered, protect nature, and wildlife, providing both narrative and descriptive opportunities to explore conservation themes. Students read about marine conservation in The Blue Heart of Our Planet, where coral reefs and ocean biodiversity are highlighted. These texts foster an appreciation for ecosystems and the natural world. However, the conservation message is still largely global in scope, with little effort made to link it back to Pakistan-specific ecosystems such as the mangrove forests of Sindh or the depleting wildlife in Balochistan. There is also a missed opportunity to include conservation actions in exercises or projects that promote hands-on environmental education.

### Climate Change and Environmental Crisis

The Punjab Board ESL textbook lacks usage of common terms, including climate, global warming, and rising temperature. Broadcast programmes for English language students use general abstract terms when discussing environmental issues within their curriculum. For instance, the textbook includes global issues and earth warming in vocabulary lists, yet it gives no meaningful discussion about them. The textbooks lack any discussion about glacial melt occurring in Gilgit-Baltistan. The areas of Baltistan experience enhanced flooding, while Sindh faces increased floods and Punjab faces heat waves. Such real and urgent phenomena are entirely missing. The theme's complete omission is concerning because Pakistan is listed among the nations most at risk from climate change, according to recent rankings. Students learn environment and disaster terminology, but the examples they receive usually depict fictional or distant events instead of Pakistan's real ecological struggles. The ESL textbook lacks visual aids, including weather charts and climate maps or graphs that could help readers understand these themes better. Students don't receive tasks to analyse regional environmental threats, nor do they have opportunities to write about those threats. Throughout their learning process students encounter climate terminology but lack the capabilities to both understand the content and take action regarding it. This textbook misses its purpose of providing sustainable language learning and promoting environmental awareness. Climate change appears invisible despite its absence as an independent subject matter. Unit 8's Safety Measures debate touches on natural disasters without using specific climate-related terms which are crucial for Sindh's population that experiences large-scale displacement due to climate-driven emergencies. Role-playing activities in Unit 4 of Punjab directly address climate refugees during instructional sessions, although Sindh's curriculum makes no mention of this topic. The My Travel Diary in Unit 7 provides an opportunity to teach climate vocabulary through the weather changes at Gorakh Hills. The diary directs its attention mostly toward landscape descriptions. The Media section in Unit 4 provides fake news criticism yet fails to examine how media reports climate-related disasters, whereas Punjab adds activities showing students how to analyse news accounts about floods. Sindh's textbook should integrate a reading comprehension about Pakistan's 2022 floods alongside Unit 1's section on Notable Leaders to teach students about climate activists. Unit 3's language practice from the curriculum provides an excellent opportunity to introduce climate-related prefixes, including eco- and bio-. The state of Punjab demonstrates a sustainable approach through its implementation of climate glossaries and assignment-based learning activities (such as designing flood-preparedness posters). The KPK textbook introduces sophisticated concepts, including the Anthropocene epoch and carrying capacity, throughout Unit 4 to present global-scale human consequences of climate change. The textbook covers droughts alongside floods yet fails to include specific instances like Pakistan's devastating 2022 flood event. Punjab textbooks present information with basic language (rising temperatures), yet KPK textbook material adopts academic language (e.g., climate as a dominant human influence). The textbook includes critical thinking questions about waste reduction; however, it provides only a superficial discussion of the question.  As per the NBF’s book, climate change is relegated to a subtext of water scarcity (rising global temperatures), with no dedicated exploration. The text’s passive constructions (challenges are compounded by conflicts) obscure agency—avoiding terms like fossil fuels, carbon emissions, or climate justice. Strikingly, Pakistan’s climate vulnerabilities (e.g., the 2022 floods displacing 33 million) are absent, severing the curriculum from students’ lived realities. The unit’s climate change mitigation strategy is reduced to infrastructural investments (better water management), ignoring grassroots resistance (e.g., Thar’s activists opposing coal mines). This aligns with state narratives that frame climate action as technical adaptation (e.g., dams) rather than political struggle (e.g., holding corporations accountable). The silence on youth climate strikes or Greta Thunberg’s influence further reveals a fear of empowering student activism. The books briefly touch on climate change, especially in Unit 3 and Unit 8 of Book 10. Phrases like climate change, melting ice sheets, sea level rise, and global warming appear in readings, particularly in discussions about Antarctica and marine environments. There is mention of international efforts such as the Paris Agreement and Sustainable Development Goals, which broadens student exposure to global climate issues. These inclusions show an attempt to educate students on how environmental crises are interlinked and global in nature. However, while these global references are relevant, they feel somewhat detached from the realities faced in Pakistan, such as increasing droughts in Sindh, extreme heatwaves in Karachi, and flooding in Punjab. The materials do not include writing tasks or debates specifically encouraging students to reflect on how climate change is affecting their immediate communities. Without this local relevance, students may struggle to see how these global challenges are personally or nationally significant.

### Daily Sustainability Practices

Daily sustainable practices which include waste reduction, water conservation and recycling appear almost nonexistent throughout the Punjab Board ESL textbook. The texts briefly introduce the points about avoiding water waste alongside clean surroundings as moral obligations instead of sustainability-based habits. The book neglects to discuss fundamental sustainable practices, including composting, plastic bag avoidance and lighting conservation, despite their application in both households and educational institutions throughout Pakistan. The expressions eco-friendly and zero waste fail to appear anywhere in the curriculum. The exercises at school do not give students work to create posters about water conservation or pen essays about their home recycling efforts. This omission stands crucial yet neglected in addressing management issues, particularly throughout Punjab. Students receive no instruction about waste sorting systems, nor learn about plastic contamination threats, nor discover how personal lifestyle choices affect environmental change. Without sustainability themes within the programme, educators miss a crucial chance to teach young individuals both responsible language skills and environmental stewardship. A unifying theme connecting individual moral values to civic duties gets lost in shallow content, which reduces education's power to create environmentally aware citizens. English Book Two for Class X by Sindh Textbook Board interprets environmental understanding through personal ethical duty instead of critical ecological necessity. The education material from Unit 8 (Civic Sense and Civic Activities) centres on cleanliness and safety while presenting sustainability with minimal guidance, such as do not litter and keep your surroundings clean. While these messages promote civic duty, they fail to connect individual behaviours to systemic environmental challenges, such as Karachi’s plastic pollution crisis or the health impacts of improper waste disposal. By contrast, Punjab’s ESL textbooks explicitly link personal habits to larger environmental consequences—for example, by tasking students with calculating their household’s plastic waste or analyzing how litter clogs urban drainage systems during monsoons. The major weakness of Sindh’s textbook emerges from its failure to build sustainability topics into its activities. The Word Game in Unit 6 (Fun Activity 6.6), together with Filling Forms in Unit 2 (Study Skills 2.5), uses common vocabulary (adventure, employment) instead of eco-literacy vocabulary. The basic science education in Punjab strengthens student abilities by introducing environmental activities alongside hands-on tasks that require students to design recycling systems and hold debates about plastic regulations. The activities about scheduling plastic recycling efforts and debating plastic bag bans teach language skills and teach environmental awareness simultaneously. Unit 4's Cause and Effect Essay (Writing 4.4) features topics without specified themes so students can choose How Plastic Bags Flood Karachi’s Streets—a topic that links vocabulary skills and civic learning about environmental issues. All educational material within the textbook misses opportunities to integrate environmental lessons beyond its dedicated environmental units. Unit 5’s Study Skills (5.5) provides instruction on time management yet omits comparisons to resource management (such as energy-efficient study methods). The grammar learning segment in Unit 3's Cool Collocations (Fun 3.6) misses the opportunity to connect environmental phrases save water or plant trees with tutorial material despite its grammatical education content. The books of Punjab make use of ecological vocabulary teaching exercises (carbon footprint, compost) to achieve normalisation of environmental terms. In Unit 10 the textbook presents three practical steps involving drip irrigation alongside water conservation and tree planting. Students perform essay writing assignments about conservation, but the activities avoid hands-on activities like school water usage audits. KPK shows a stronger preference for agricultural solutions, including conservative farming, instead of Sindh's community cleanliness emphasis. There aren't many moral arguments for responsibility. However, in private books, such as NBF’s book, individual actions (recycling, saving water) are prescribed as moral duties, divorced from collective or policy-driven change. The textbook’s email-writing exercise (Request a cheque book) epitomises missed opportunities—why not simulate lobbying for school composting programmes? Hygiene (handwashing) is overemphasised, while high-impact behaviours (e.g., reducing meat consumption) are ignored. The text’s tone is paternalistic (You must conserve), failing to engage students as agents (e.g., audit your school’s plastic waste). Notably, sustainability is stripped of cultural context: no Sufi references to water’s sanctity or folk proverbs about thrift. This reflects a colonial hangover—prioritising Eurocentric SDG jargon over indigenous knowledge (e.g., karez irrigation systems). Daily eco-actions like recycle, save water, and turn off lights are noticeably underrepresented in the Oxford textbooks. There are brief moments where personal responsibility and environmental care are mentioned—such as in a formal letter written by a student thanking an environmental department for a Green Schools event (Book 9)—but this is more the exception than the rule. Compared to other themes, this one is the weakest in terms of consistency, variety, and student engagement. There are few if any structured tasks where students are encouraged to design posters, write pledges, or conduct mini-research on how they can contribute to sustainability. This is a missed opportunity given how effective simple behavioral modeling can be for developing eco-conscious habits among students. More localized examples—like avoiding plastic shopping bags or conserving electricity during peak hours—would make the content more meaningful. Integrating this theme into grammar, writing, and speaking exercises could strengthen its impact on student awareness and lifestyle habits.

## Visual Analysis

### Pollution and Health Hazards

The Sindh textbook shows only idealized clean streets in illustrations. In Punjab's no relevant visuals were found to support pollution-related content such as smog, litter, or factory smoke. The KPK textbook describes air/water pollution (e.g., "garbage-mounds," "industrial waste") but lacks visuals like smog-covered cities or polluted rivers, missing a chance to localize issues (e.g., Peshawar’s air quality). The The textbook includes no images or diagrams of polluted water sources, smog, or health impacts (e.g., diseased communities). A single generic illustration of a water droplet (p. 57) appears, but it lacks contextual labels (e.g., "industrial vs. natural water"). This fails to meet the objective of localizing pollution issues or fostering critical engagement.In the Oxford book, There are no direct visuals or illustrations of pollution such as smog, litter, factory smoke, or health impacts. However, Unit 1 in Book 9 references a news headline “Poisonous Pollution To Blame For Fish Disaster” within a reading passage, but it is presented textually without any image support.

### Natural Resources and Conservation

In Punjab’s book, no visuals were found depicting climate-related issues like floods, rising temperatures, or natural disasters. Sindh's book features scenic nature images like Gorakh Hills without conservation context.InPubjab;s textbook, Some visuals of trees and greenery were present, but they were not explicitly linked to conservation themes. KPK’s book shows *indirect visuals only.* A photo of the Cordoba Masjid’s greenery hints at preservation, while the Indus Basin diagram educates—but no images show deforestation or dying ecosystems, unlike Punjab/Sindh’s books. The NBF book No visuals depict Pakistan’s ecosystems (e.g., Indus River, mangroves) or conservation efforts. A missed opportunity: maps of water-stressed regions or infographics on deforestation rates could have enhanced relevance to national challenges. The absence undermines the objective of connecting global SDGs to local contexts. There are references to nature (trees, forests, reefs), but no accompanying pictures or diagrams showing forests, biodiversity, or animals in Oxford’s book too. Units discussing trees and reefs (Book 10, Units 5 and 8) are rich in text and contain strong descriptive elements, yet visuals such as photographs or illustrations are missing, which could have helped students visually connect with the topic.

### Climate Change and Environmental Crisis

Sindh's textbook contains no visuals of climate impacts like floods or droughts nor does KPK’s and Punjab’s books. In NBF book, zero images address climate change (e.g., floods, heatwaves). A graph on water scarcity statistics (p. 58) is purely textual, lacking visual appeal. This omission contradicts the objective of raising awareness about urgent crises, as visuals could humanize data (e.g., before/after photos of glacial melt). In Oxford’s book, In topics like melting ice caps, sea level rise, and global warming, especially in the Antarctica and coral reef units, there is no supporting visual material. These topics are purely addressed through reading passages and rhetorical speeches (e.g., The Paris Agreement), but lack visual aids like climate graphs, polar ice images, or environmental maps, which would have added depth.

### Daily Sustainability Practices

In Punjab’s book, no visuals were provided to illustrate recycling, saving water, or other sustainable daily habits. The Sindh textbook only shows simple cartoon images of street sweeping for cleanliness lessons. It lacks practical sustainability visuals like recycling symbols or energy conservation tips seen in other provincial textbooks. *In KP’s book,*  a mind-map lists "Environmental Destruction" but lacks actionable visuals (e.g., recycling bins, water-saving techniques), unlike Sindh’s child-friendly illustrations. The NBF textbook contains the email-writing exercise (p. 69) includes a template screenshot, but no visuals model eco-actions (e.g., recycling bins, water-saving techniques). This limits the objective of promoting behavioral change, as imagery could reinforce practical steps (e.g., infographics on plastic alternatives). In Oxford’s publication, There is one indirect visual reference through a formal letter written by a student about recycling at their school, which mentions the use of separate bins for paper and plastic. However, no image of the bins, recycling logos, or school campaign posters is provided. All ideas remain text-based and hypothetical in structure.

# Discussion on findings

## Theme 2: Natural Resources and Conservation

It is concerning that those ESL textbooks from Pakistan transform ecological problems into simple, idealised and ethically charged stories. “Forests”, “biodiversity” and “water conservation” are often included in the textbooks, but with little emphasis on how much Pakistan suffers from environmental problems. Descriptions of Gorakh Hills and the Indus River are about their stunning nature instead of their risk of becoming polluted and telling someone to plant a tree does not explain how this will help in India which is losing valuable forests at a rapid pace. Lots of picturesque views and calm waters are present, but there is no hint of deforestation, dried-out lakes or threatened wildlife. . For this reason, Amjad et al. (2022) describe aspects of nature as “ecological postcard syndrome,” creating the impression in books that the environment never changes or faces problems when it does. These findings meet both the aim(analyzing presentation through text/visuals) and the interest of the **Research Question** (evaluating how ecological concepts are presented). In environmental education, textbooks do not even reach the minimum standards because conservation should require students to think critically about current problems. Still, their writing has a dreamy feel, focusing on Pakistan’s nature while ignoring the trees they have cut, the water they have wasted and the rules or laws being broken. Punjab’s textbooks describe the Indus River, but they fail to mention that it is one of the world’s most at-risk rivers because of dams and overuse of land for farming. It is similar to Freire’s (1970) view that students generally receive facts they cannot question or apply in their lives (Nugraha, Wibowo and Hendrawan, 2024). Further examinations agree with these concerns. Amjad et al. concluded that conservation in Pakistani textbooks is taught as an appealing idea rather than something necessary to live. Also, according to Bloom and Quebec Fuentes (2019), environmental education works best by presenting students with challenges (such as analyzing cutting down trees and weighing constructing a new dam in an area) which are missing in the chosen textbooks. On the other hand, the Singapore approach is very different, as Akram et al. (2023) explain that learning about mangroves includes role-playing in parliamentary meetings, planning ways to inform the public and analyzing how their habitats can be threatened. The lesson format is closer to CLIL’s aim than Pakistani textbooks’ practice of separating vocabulary from environmental purposes. The consequences are very serious. As a result, by not including Pakistan’s conservation problems in their books, textbooks become responsible for a lack of environmental knowledge among learners (Shah 2024). Students are able to explain what biodiversity means, yet they cannot explain the reasons behind the snow leopard’s vanishing or the problems caused by cotton farming in the Indus Basin. This results from Pakistan’s education system not resonating with UNESCO’s (2021) ESD framework which guides students to take action. An example is that Finnish students are required to figure out their school’s carbon footprint, but in Pakistan, there are no such activities; instead, they find pictures and poems about nature. Accordingly, as an answer to RQ, conservation concepts are given as straightforward information, prioritizing their appeal over their necessity and ethics over big-picture changes. The best way to solve this issue is for textbooks to add CLIL strategies such as taking up conservation subjects for discussions, analysis of laws and working on projects.

## Recommendations for Future Studies

To enhance ecological content in Pakistani ESL textbooks, several targeted strategies are recommended. Firstly, contextualising lessons with local environmental issues—such as Lahore’s smog, Karachi’s water shortages, or deforestation in Khyber Pakhtunkhwa—can make content more relevant. Using real-world data like air quality indices and glacier melt rates not only fosters critical thinking but also strengthens learners' connections to their environment. Integrating a critical CLIL is also crucial. This involves designing activities where students debate eco-policies, analyze industrial effects, or role-play climate negotiations, blending language skills with ecological awareness and civic responsibility (Affandi and Nurfadhillah, 2023). Visual pedagogy should be revamped by replacing decorative images with meaningful visuals—such as infographics on Pakistan’s carbon footprint or photos depicting environmental degradation and recovery. This shift supports comprehension and empathy. Another important recommendation is the incorporation of indigenous ecological knowledge, like karez irrigation and community forestry. These culturally rooted practices promote sustainability while honoring heritage. Teacher training is essential to implement these changes. Workshops should be developed to help educators teach ecological themes interactively, supported by open-access digital resources such as videos on Indus River pollution and renewable energy lesson plans.

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