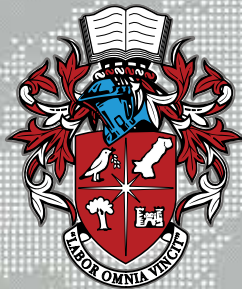


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EDITORIAL NOTE

Greetings the New Horizons, we are proudly presenting you the latest edition of New Horizons Volume 19, Issue 2. This issue includes research articles from Literature and Linguistics, Education, International Relations, Political Science, Socio-Economics and Sociology Fields, where authors emphasized the effects of the economic, social and technological impacts.

I take this opportunity to acknowledge the contribution of Dr. Naveed Mughal and Dr. Rab Nawaz for their support to publish this issue and also the support rendered by the editorial assistants.

Lastly, I would like to express my gratitude the authors, reviewers, the publisher, the advisory and the editorial boards of the journal and the office bearers for their support in bringing out yet another volume and look forward to their unrelenting support for the successful release of upcoming editions.

Dr. Muhammad Asif Khan

Editor

New Horizons

TABLE OF CONTENTS

Articles	Page No.
CONSTRUCTING A "NEW TURKIYE" THROUGH EDUCATION: POLICIES AND RECOMMENDATIONS <i>Dr. Fatima Agha Shah</i> <i>Cemal Sangu</i>	1-12
EXPERIENCES OF PARENTS WITH CHILDREN HAVING LEARNING DISABILITIES AND/OR ADHD IN PAKISTAN <i>Dr. Shazia Nasir, Dr. Sharifah Muzlia, Dr. Hamimah Hashim,</i> <i>Dr. Fatin Aliana</i>	13-25
CLIMATE-SMART INTEGRATION OF RICE AND LOCAL PALM PRODUCTION: ENHANCING RESILIENCE AND SUSTAINABILITY IN TROPICAL AGROECOSYSTEMS <i>Passanan Assavarak*, Prapamon Seeprasert,</i> <i>Ittisak Jirapornvaree</i>	26-42
EMPLOYING CULTURAL TOURISM TO PROMOTE SUSTAINABLE DEVELOPMENT: INSIGHT FROM GALLE FORT AND KOT DIJI <i>Ayesha Agha Shah, Lubaina Soni</i>	43-63
PUBLIC-PRIVATE PARTNERSHIPS (PPPS) AND THEIR EFFECTIVENESS IN PROMOTING SUSTAINABLE ECONOMIC DEVELOPMENT IN UNDERDEVELOPED REGIONS <i>Dr. Allauddin, Dr. Syed Shahab Uddin</i>	64-72
CLIMATE CHANGE AND THE KINGDOM OF SAUDI ARABIA: CHALLENGES AND OPPORTUNITIES <i>Muhammad Siraj Ul Huda Khan</i>	73-85

CHALLENGES, IMPACT AND ECONOMIC CONDITIONS AFFECTING SUSTAINABLE DEVELOPMENT IN THIRD WORLD COUNTRIES

Themes: Quality Education: A Dynamic And Comprehensive Approach
That Goes Beyond Traditional Academic Achievements To Encompass The Broader
Goals of Personal Development, Societal Contribution, And Global Citizenship

CONSTRUCTING A "NEW TURKIYE" THROUGH EDUCATION: POLICIES AND RECOMMENDATIONS

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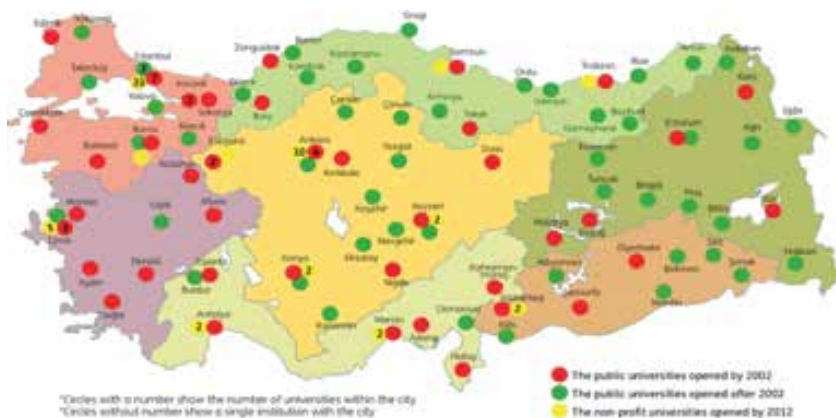
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ABSTRACT

The shift from traditional academic metrics to a holistic educational framework is revolutionizing Turkiye's educational landscape. This comprehensive approach highlights its crucial role in nurturing personal growth, fostering community involvement, and promoting global citizenship. The abstract focuses on the concept of high-quality education, highlighting its various objectives that extend beyond traditional academic achievements. The focus is on providing a high-quality education that encompasses more than just academic achievements. It aims to foster personal development, make a positive impact on society, and cultivate global citizenship. This study explores the importance of high-quality education in shaping a "New Turkiye" and effectively responding to present challenges and demands. This text delves into Turkiye's active and innovative foreign policy, which has led to the establishment of institutions like Turkish Maarif Foundation -TMF, with a strong emphasis on education and cultural diplomacy. The paper highlights Turkiye's contribution to providing higher education opportunities to students from Turkic States and nearby populations, highlighting the commitment to education as a means of international engagement. In addition, the establishment of institutions like Presidency for Turks Abroad and Related Communities (YTB) and its Turkish Scholarships Program showcases Turkiye's commitment to

promoting culture and education in its foreign policy. In addition, the study emphasizes the importance of education in achieving broader societal objectives, such as fostering a sense of responsibility, empathy, and active involvement in building a better society. International education initiatives, such as the movement of students and various educational activities, are seen as important tools for strengthening political and cultural influence and promoting lasting cultural connections. An analysis is conducted on the impact of the Turkiye-Pakistan alliance on educational policies, collaboration, and the exchange of ideas. The study suggests potential collaborations in education between Turkiye and Pakistan, focusing on mutual learning, cultural exchange, and shared educational goals. The research paper concludes by offering a forward-looking perspective on the potential impacts of these educational policies and suggestions. It envisions a "New Turkiye" characterized by a diverse and globally engaged population. The establishment of TMF in 2016 is seen as a significant step towards creating a globally connected and culturally aware population. The study paper delves into the different facets of education's impact on Turkiye's future, with an emphasis on high-quality education, global collaborations, and the broader societal consequences of educational initiatives.

Keywords: Turkiye Education, Turkish Scholarships Program, Global Engagement, Education.



INTRODUCTION

Turkiye's education system has seen substantial changes throughout time, driven by a range of reasons, including adjustments in foreign policy strategies. Since the early 2000s, Turkiye's foreign policy has undergone significant transformations, placing increasing importance on soft power and proactive involvement in global affairs. The country's educational priorities have been significantly influenced by this shift (Nye, 2004). Turkiye is actively pursuing strategic initiatives to advance cultural diplomacy,

globalization, high-quality education, and international collaboration by 2030, in alignment with global objectives such as the Sustainable Development Goal 4 and the Incheon Declaration (UNESCO, 2016). These endeavors are customized to be efficacious on both a nationwide and regional scale.

An essential element of Türkiye's foreign policy shift is in its emphasis on employing soft power, specifically through cultural and educational interactions with neighboring countries. The Great Student Project in the 1990s serves as a prime example of Türkiye's dedication to globalization and the promotion of top-notch education (Çelik, 2022b). The Yunus Emre Foundation and the Yunus Emre Institute, which are supported by the government, have significant influence in advancing cultural diplomacy and defining Türkiye's educational environment (Çelik, 2022a). Türkiye's endeavors transcend national boundaries, encompassing educational programs and cultural projects that seek to enhance standards within the country and on a global scale.

Türkiye has conducted a range of educational programs both within its own borders and abroad, in addition to its cultural diplomacy initiatives, with the aim of improving the standard of education. TİKA and YEE have offered project-oriented educational assistance and courses on Turkish language and culture, in line with Türkiye's strategy of globalization and enhancing its educational environment (Çelik, 2022a). The presence and functioning of international schools in Türkiye, in addition to efforts such as the Turkish Maarif Foundation overseeing educational institutions abroad, have significantly promoted the idea of providing top-notch education within the country (Akgün and Özkan, 2020).

Türkiye's emphasis on cultural diplomacy, globalization tactics, and educational initiatives has significantly influenced the worldwide educational environment. The Turkish educational system faces a range of obstacles, such as venturing into new areas, striking a harmonious equilibrium between local demands and global standards, and maintaining competitiveness in the worldwide education industry. The Turkish Maarif Foundation (TMF) has implemented a thorough strategy to tackle these difficulties, utilizing its standing as a public foundation and its capacity to conform to domestic laws (Türkben, 2022). The Yunus Emre Institute and active engagement in exchange programs facilitate global collaborations and activities aimed at cultural exchange. Türkiye's educational progress demonstrates a commitment to conforming to global educational objectives through targeted efforts centered around cultural diplomacy, internationalization, high-quality education, and global cooperation.

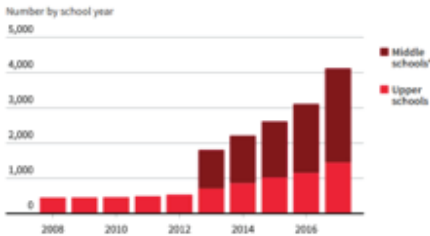
The curriculum of TMF is based on a five-pillar model that prioritizes modern science, social sciences, information technology, foreign language skills, and local cultural values. This distinctive approach sets TMF apart in the competitive global market (Türkben, 2022). TMF strategically situates itself within the global education environment by incorporating local languages and cultures, enhancing curricular material, and promoting humanitarian principles (Akgün & Çelik, 2022).

In addition, TMF provides alternative curriculum choices such as the International Maarif Program (IM), which customizes educational materials to fulfill the specific requirements of host nations while also promoting Türkiye's cultural presence

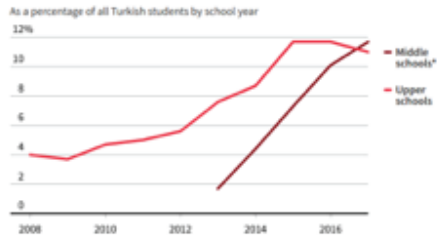
(Akgün & Çelik, 2022). This strategy not only tackles the difficulties encountered by the Turkish educational system but also promotes amicable interactions within the Turkish community and nurtures international friendships and cooperation (Nye, 2004). Türkiye seeks to cultivate lasting connections with future world leaders by implementing initiatives such as extensive student projects, exchange programs, and scholarships. This endeavor intends to foster mutual understanding and collaboration, as stated by Nye in 2004.

Türkiye's emphasis on holistic education is in line with its broader objectives of societal advancement and global involvement, since it prioritizes cultural and educational matters in its foreign policy. Türkiye has created several institutions, such as the Yunus Emre Institute, the Presidency for Turks Abroad and Related Communities (YTB), and the Türkiye Maarif Foundation (TMF), with the aim of advancing Turkish language, culture, and education on a global scale. These endeavors support Türkiye's strategy of internationalizing education, with the goal of enhancing the country's political and cultural influence, promoting awareness of Türkiye, and fostering enduring connections with other societies (Çelik, 2022a). Comprehensive education, encompassing both formal and non-formal educational endeavors, enables Türkiye to actively participate in global affairs, garner the attention and support of other nations and societies, and cultivate a favorable international public perception (Çelik, 2022a). Türkiye's emphasis on comprehensive education promotes societal progress and strengthens its international involvement through the cultivation of cultural interchange, educational prospects, and amicable relations with other countries.

IMAM HATIP SCHOOLS

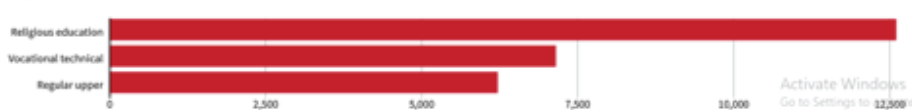


RELIGIOUS SCHOOL STUDENTS



GOVERNMENT SPENDING PER UPPER SCHOOL STUDENT

Budget plans for 2018, by type of school. Amounts in Turkish liras.



Methodology

The study aims to gather and examine data on Türkiye's educational endeavors, partnerships, and policies by utilizing scholarly literature, policy documents, government reports, and statistics from several databases. The study will employ a qualitative content analysis methodology to identify prominent themes, patterns, and trends pertaining to Türkiye's educational diplomacy, collaborations with other countries, and focus on comprehensive education. The analysis will concentrate on Türkiye's goals, tactics, difficulties, and results in education diplomacy.

The combined findings will be analyzed to establish a comprehensive comprehension of Türkiye's contribution to education through its foreign policy, the characteristics and consequences of its educational partnerships with other nations, and the ramifications of its focus on holistic education. The study will rigorously examine the data by applying theoretical frameworks and pertinent literature to derive findings and ascertain significant insights.

The Historical Origins Of Türkiye's Education System

Türkiye's education system has strong historical linkages with populations that share cultural, historical, and religious connections. Since the early 2000s, Türkiye's foreign policy, especially under the AK Party government, has transitioned towards employing soft power methods and international policies with the goal of enhancing relationships with countries that share historical affinities (Nye, 2004).

The impact of global trends and Key Stakeholders in the Education Industry.

Türkiye's educational reform agenda has been greatly impacted by global trends such as globalization and developments in communication technologies. Türkiye has effectively employed student exchange programs as a means of public diplomacy to cultivate partnerships with other nations, acknowledging the significance of international involvement in diverse fields such as research, education, culture, and the arts (Özkan, 2013).

Government officials, policymakers, educators, students, and civil society organizations are all important participants in the education sector in Türkiye. They collectively influence the development of education policy (Nye, 2008). Government officials establish the overall direction and priorities for education policy, policymakers develop and execute reforms to improve educational quality, educators deliver education and shape curricula, students offer crucial perspectives, and civil society organizations advocate for specific educational priorities and ensure they are in line with societal needs.

Establishment and Operations of Türkiye Maarif Vakfı (TMF); Legal Framework and Revenue and Streams

The creation of the Türkiye Maarif Vakfı (TMF) was significantly shaped by Türkiye's proactive foreign policy in the last twenty years, specifically its emphasis on popular diplomacy (Akgün & Çelik, 2022). The establishment of TMF aimed to capitalize on the opportunities that arose for Türkiye in the global stage after the Cold War, specifically to strengthen its ties with regions such as Central Asia, the Caucasus, the Balkans, and the Middle East (Çelik, 2022b). In addition, TMF was established as a response to the educational endeavors of FETÖ, a terrorist organization purporting to advocate for Türkiye's interests internationally (Çelik, 2022b). TMF works within a legal framework that provides exemptions and exceptions from taxes, charges, and fees that are usually imposed on public legal bodies. Additionally, TMF representatives and staff are granted privileges such as the use of diplomatic and service passports (TMF, 2022). TMF generates revenue through many sources, such as revenues from international educational activities, asset assessment, contributions, financial assistance, and allocations from the public budget (TMF, 2022d).

In addition, TMF obtains revenue from commercial endeavors through Maarif International Education Institutions Joint Stock Company (MUEKAŞ) and receives donations, both with and without conditions, to augment its resources (TMF, 2022). The user's text is empty.

Turkiye's Holistic Education Initiatives: Fostering Equity, Inclusivity, and Global Engagement

Turkiye has deliberately employed student exchange programs as a component of its public diplomacy strategy, with the objective of cultivating stronger connections with global communities through the dispatch of Turkish nationals overseas and the promotion of Turkish ideals. Nevertheless, the absence of a clear strategy for Türkiye's funded international student mobility initiatives has been identified as a drawback (Nye, 2004). In response to this issue, Türkiye has implemented various measures to advance a comprehensive educational framework, utilizing institutions such as the Yunus Emre Foundation, the Yunus Emre Institute, the Presidency for Turks Abroad and Related Communities (YTB), and the Turkish Maarif Foundation (TMF) (Çelik, 2022a).

Equity and Inclusivity Initiatives

Turkiye's educational strategy, shown by efforts such as the Turkish Scholarships Program and the establishment of educational institutions abroad by TMF, aims to offer educational opportunities to neglected communities and overseas students. Türkiye aims to promote equal educational opportunities for various populations, both inside its borders and abroad, through the provision of scholarships and educational assistance (TMF, 2019).

Cultural and Social Implications

The transition towards a comprehensive approach to education in Türkiye, focusing on the promotion of Turkish language and culture on a global scale, has substantial cultural, social, and economic ramifications. These programs have a role in promoting Türkiye's cultural heritage and language on a global scale, while also encouraging intercultural exchange and building understanding. Türkiye promotes social integration and establishes positive relationships by offering educational opportunities through scholarships and institutions overseas. Türkiye has the potential to become a significant player in the global education market by leveraging international education mobility and increasing its cultural influence. This might result in economic advantages and prospects for collaboration (Çelik, 2023).

Turkiye's comprehensive education efforts demonstrate its dedication to promoting fairness, inclusiveness, and international involvement in education. Türkiye seeks to enhance its global presence and influence through education and cultural diplomacy, with a focus on addressing educational access concerns and fostering cultural understanding (Çelik, 2023). Nevertheless, persistent endeavors and deliberate strategizing are imperative to optimize the influence of these endeavors and accomplish enduring advancement towards a society that is more inclusive and internationally conscious.

Strengthening Bilateral Relations between Pakistan and Turkiye

Pakistan and Turkiye's strategic locations place them in regions characterized by intricate security dynamics, which have arisen from their participation in the Cold War and its subsequent consequences (Rana, 2016). Nevertheless, both states have always kept amicable relations since the establishment of Pakistan. Although there is recognition of the possibility for mutual cooperation, there seems to be a lack of concrete collaborative endeavors. The economic and commercial connections, which are essential for both parties to gain advantages, are not fully developed, primarily due to obstacles like trade barriers that impede advancement. The application of safeguard levies by Turkiye on Pakistani textile exports, along with Pakistan's exclusion from the EU's Generalized Scheme of Preferences (GSP) Plus status, are significant obstacles to economic partnership (Krishnankutty, 2023). In addition, the lack of cultural interaction and intellectual engagement hinders the development of a deeper understanding and collaboration between the two nations, despite the positive opinions held by their respective publics (Salman, 2015).

The bilateral connection between Turkiye and Pakistan has persevered over a multitude of hurdles, encompassing political upheaval and external menaces. The depth of the friendship between Turkiye and Pakistan is highlighted by Turkiye's assistance for Pakistan in times of crisis, such as the wake of the 2003 Istanbul assault (Akram, 2021). Nevertheless, despite enduring political connections, the level of commercial cooperation falls short of anticipated outcomes. The insufficiencies in transportation infrastructure and the absence of coordinated initiatives to enhance trade and investment collaborations are substantial obstacles to achieving economic integration. To tackle these difficulties, it is necessary to collaborate and improve transportation networks while also creating venues for economic, trade, and technological cooperation. The partnership between Turkiye and Pakistan has a profound influence on educational policies, cooperation, and the interchange of ideas. The two nations possess powerful cultural and theological affinities, resulting in the establishment of educational collaborations focused on reciprocal knowledge acquisition, cultural interchange, and the attainment of common educational objectives. The current educational connections between Turkiye and Pakistan involve the transfer of professional and scientific personnel, which helps to enhance economic stability, particularly for Pakistan (Gul, 2014; Ali, 2017). Furthermore, both nations have implemented the Turkiye-Pakistan Joint Economic Committee Mechanism, demonstrating a dedication to strengthening economic collaboration through educational exchanges (Gul, 2014).

Pakistan can gain advantages from Turkiye's strong economy, which is marked by substantial investments in renewable energy and manufacturing industries. However, fully harnessing the potential of their economic partnership necessitates overcoming current obstacles. The establishment of a collaborative freight line and the promotion of public-private partnerships could enhance the facilitation of commerce and investment between the two countries (Turkiye Ministry of Foreign Relations, 2022). Moreover, by establishing research institutes and cultural institutions, we may strengthen cultural interchange and intellectual collaboration, so promoting a deeper mutual understanding and fostering long-lasting connections. Pakistan and Turkiye can strengthen their strategic alliance and promote regional security and prosperity by effectively tackling these problems and utilizing their complementary assets.

Regarding future prospects, there is a proposition for Turkish corporations to augment their investments in Pakistan to exceed \$1 billion. These interactions would not only enhance cultural and economic linkages, but also create prospects for educational collaborations, professional skill enhancement, and exposure to novel concepts (Gul, 2014). The alliance between Turkiye and Pakistan, based on shared cultural and religious ideas, has resulted in collaborative endeavors to combat terrorism and the implementation of many bilateral initiatives to promote economic cooperation (Guo, 2019).

The current and prospective educational partnerships between Turkiye and Pakistan are centered around augmenting reciprocal knowledge acquisition, cultural interchange, and attaining common educational objectives. These collaborations are crucial for enhancing the relationship between the two nations and guaranteeing sustained economic prosperity through educational alliances and the interchange of ideas.

Discussion

Turkiye's proactive engagement in advancing education through its foreign policy endeavors has both prospective advantages and disadvantages. These programs have the potential to strengthen Turkiye's soft power and worldwide impact by promoting positive impressions of Turkiye as a supporter of education and cultural exchange, hence enhancing goodwill towards the country (Nye, 2004). Turkiye can enhance diplomatic relations and establish enduring connections with other countries by offering educational opportunities overseas and actively participating in cultural diplomacy. In addition, the promotion of education can enhance global stability and development by empowering individuals and communities with information and skills.

Nevertheless, Turkiye's extensive engagement in education promotion through foreign policy may have certain disadvantages. There can be difficulties in guaranteeing the excellence and efficiency of educational programs carried out in foreign countries. Additionally, there are worries about the manipulation of education for political purposes and possible conflicts of interest (Nye, 2004). Furthermore, education programs may have limitations in their ability to significantly influence broader geopolitical challenges. Additionally, Turkiye's foreign policy agenda may have conflicting goals that could overshadow the importance of educational activities.

Turkiye and Pakistan are strategically located in regions characterized by intricate security dynamics, which have emerged as a result of their participation in the Cold War and its subsequent consequences (Rana, 2016). Nevertheless, both countries have always kept amicable relations since the establishment of Pakistan. Although bilateral collaboration is recognized, there seems to be a dearth of concrete collaborative initiatives. The economic and commercial connections, which are essential for both parties to gain advantages, are still not fully developed, mainly due to obstacles in trade that are impeding advancement. The application of safeguard levies by Turkiye on Pakistani textile exports, along with Pakistan's exclusion from the EU's Generalized Scheme of Preferences (GSP) Plus status, are significant obstacles to economic cooperation (Krishnankutty, 2023). Furthermore, the lack of extensive

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Pakistan can gain advantages from Turkiye's strong economy, which is marked by substantial investments in renewable energy and manufacturing industries. However, fully harnessing the potential of their economic partnership necessitates overcoming current obstacles. The establishment of a collaborative freight line and the promotion of public-private partnerships could enhance the facilitation of commerce and investment between the two countries (Turkiye Ministry of Foreign Relations, 2022). Moreover, by establishing research institutes and cultural institutions, we may strengthen cultural interchange and academic collaboration, which in turn can increase mutual understanding and cultivate long-lasting connections. Pakistan and Turkiye can strengthen their strategic alliance and promote regional security and prosperity by effectively tackling these problems and utilizing their complementary assets. These collaborations have the potential to dismantle stereotypes and prejudices, foster empathy and tolerance, and establish connections between disparate populations. Moreover, educational collaborations can enhance the sharing of knowledge and specialized skills, resulting in reciprocal advantages in domains such as scientific investigation, technology dissemination, and inventive advancements.

Turkiye's focus on comprehensive education has substantial ramifications for its position in the international community and its interactions with other countries. Turkiye may establish itself as a pioneer in education reform and innovation by advocating for a comprehensive educational framework that includes not just academic learning, but also personal development, community engagement, and global citizenship (Çelik, 2023). The focus on holistic education is in line with the wider global movement towards a more thorough comprehension of education and its function in promoting sustainable development and social unity. In addition, Turkiye may enhance its diplomatic ties with other countries by prioritizing comprehensive education that encompasses all aspects of learning. This approach would facilitate the promotion of common principles and goals, including the advancement of peace, tolerance, and sustainable development. In summary, Turkiye's focus on comprehensive education has the capacity to bolster its impact and standing on the worldwide platform, while also fostering beneficial societal transformation and global collaboration

Conclusion

This study has undertaken a comprehensive analysis of Turkiye's activities to promote education through its foreign policy initiatives, collaborations with other countries in the education sector, and its emphasis on a holistic approach to education. Through a thorough examination of relevant literature and data, multiple major discoveries have been revealed. Turkiye's educational advancement demonstrates a commitment to following these ideals through the implementation of strategic initiatives that prioritize cultural diplomacy, globalization, top-notch education, and worldwide partnership. The Incheon Declaration establishes a global framework for the promotion of education. Turkiye's approach prioritizes the need of placing global educational goals within specific national and regional contexts to ensure effective implementation and impact. Turkiye's significant involvement in promoting education as part of its foreign policy goal offers potential benefits and drawbacks. Introducing educational initiatives in Turkiye has the capacity to enhance the country's soft power and enhance its diplomatic ties with other states. Nevertheless, it is imperative to address obstacles such as upholding program excellence and averting politicization.

Education collaborations between Turkiye and nations like Pakistan are crucial for fostering mutual comprehension, cultural exchange, and the dissemination of information. Student exchange programs and collaborative research efforts promote the formation of ties among diverse groups and encourage international collaboration. The alliance between Turkiye and Pakistan has exerted a significant influence on educational policies and partnerships. Both nations share cultural and theological connections, which have facilitated educational partnerships centered on the sharing of knowledge and shared goals. These relationships have resulted in the exchange of well-educated and scientific workers, therefore contributing to economic stability. The Turkiye-Pakistan Joint Economic Committee Mechanism demonstrates a firm commitment to improving economic cooperation through educational exchanges. In the future, Turkish companies are expected to increase their investments in Pakistan, aiming to exceed \$1 billion. This would strengthen cultural and commercial ties between the two countries and foster economic cooperation.

Turkiye's emphasis on holistic education underscores its commitment to fostering not only academic knowledge but also personal growth, community involvement, and global citizenship. This approach aligns with the broader trend of gaining a comprehensive understanding of the role of education in promoting sustainable development and developing social cohesion.

Turkiye's endeavors in education diplomacy possess the potential to enhance its influence on the global stage, while also promoting positive societal change and facilitating international cooperation. By consistently prioritizing education as a crucial component of its foreign policy agenda, Turkiye has the capacity to strengthen its diplomatic relations with other nations and actively contribute to a more prosperous and interconnected global community.

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EXPERIENCES OF PARENTS WITH CHILDREN HAVING LEARNING DISABILITIES AND/OR ADHD IN PAKISTAN

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ABSTRACT

This interpretive phenomenological qualitative research study explored the psychological and emotional experiences of parents with children having specific learning disabilities in Pakistan. Focus group discussions with five parents were conducted on zoom. After the data collection from each of the participants was assessed, a cross-case production of the data was completed to develop a list of the themes common among the participants. The sub-themes and the themes originated from the codes are (1) Parents Challenges with the sub-themes of Parenting Style, Emotional Responses and Sufferings. (2). Support from Academia with the sub-themes of Relationship with the teachers, Financial Stress and Modifications in Assessments/ Examinations. The themes originated, after the focus group discussion with the five parents, contain the struggle of the parents of LD children in preparing them to do better academically and socially. The findings revealed that the parents with children having learning disabilities have a very challenging and demanding role as a parent. Their struggles and challenges are more exhausting emotionally, physically, and financially. Parents struggle to identify academic problems faced by children due to lack of awareness which adds to their struggle as well as the children. Parents are the primary caretakers and guardians and are responsible for the upbringing of their children. It is not easy being a parent, but the situation gets difficult when children are identified with learning disabilities.

Keywords: Learning disabilities, Parents, Emotional trauma, Financial Stress

1. INTRODUCTION

According to the National Joint Committee on Learning Disabilities (Jones & Wallace, 2013) an organization working for the welfare and education of learning disabilities (LD) since 1975, learning difficulties are a heterogeneous group of disorders that include difficulties in reading, writing, listening, speaking, comprehension and mathematical abilities (Waqar & Vazir, 2010). They are caused due to some malfunctioning of the central nervous system and can affect the entire life, although it has been observed that many times learning disability students do not exhibit any dysfunction of the brain. Upon reflecting on the above definition, it is evident that it is not one disorder but a group of disorders that affect the learning abilities of specific children (Waqar & Vazir, 2010). Therefore, it is not likely that all LD students show the same level of disability. In a classroom with five LD students, each will be exhibiting a different disability with varying severity ranging from borderline to severe. It can be said that learning disabilities are not like other medical problems with known causes and symptoms. Rather, LD is an extensive term that encompasses a variety of causes, symptoms, supervisions, and actions. The marks of a learning disability on a child's life can be extremely distressing (Mishna, 2003). Parents with children having learning disabilities have a very challenging and demanding role as a parent. Their struggles and challenges are more exhausting emotionally, physically, and financially. Parents struggle to identify academic problems faced by children due to lack of awareness which adds to their struggle as well as the children. Parents are the primary caretakers and guardians and are responsible for the upbringing of their children. It is not easy being a parent, but the situation gets difficult when children are identified with learning disabilities (Mearig, 1992).

As opposed to the developed countries, the educational institutions of Pakistan, a country which is still in the process of developing, are still not ready to give students with learning disabilities a fair chance to grow and be useful members of society (The Express Tribune, 2013). This is because of a lack of awareness and knowledge about learning disorders. Pakistan is a country where the population ratio of rural vs. urban is 60 % and 40% respectively. It is not only in rural areas that people are unaware of the learning disabilities in their children, much of the urban population as well is still unaware of it; some go into the denial phase when told that their son/daughter must be diagnosed by a psychologist. According to the chief executive of the Foundation for Rehabilitation and Education of Special Children, Ms. Ashba Kamran, 10 to 18% of children in Pakistan's private schools have been diagnosed with learning disabilities whereas the situation is even graver in the public sector schools (The Express Tribune, 2013).

1.1 CHALLENGES FACED BY PARENTS OF LD CHILDREN

It is without any doubt that the family, especially the parents play an important role in the education of their LD child. Starting from the first stage of detection till the identification and diagnosis, parents face a lot of challenges at every stage.

They held teachers responsible for having a negative attitude towards their LD child and consider the parents as having low social and cognitive abilities due to their child's disability. Moreover, as the schools are more concerned about their reputation as compared to imparting knowledge or putting more effort into their students, therefore, the most affected ones are the LD students. And due to the limited involvement of parents of LD children, these children suffer more academically (Alobaid, 2018).

1.2 RESEARCH QUESTION

This paper focuses on the experiences of parents with children having a specific learning disability in Pakistan:

1. What are the experiences of parents having children with a specific learning disability in Pakistan?

2. LITERATURE REVIEW

Learning disability refers to delays or deviations and discrepancies in performances in subjects like arithmetic, reading, and writing. A child with a learning disability is not subjected to mental retardation. (Harris, Swanson, & Graham, 2003). Some of the common factors leading to learning difficulties include genetic factors or neurobiological disorders that alter the functioning of the brain. This change in the way your brain functions affects the cognitive process related to learning such as reading, writing, or sometimes Math (Thomas & Woods, 2006).

Parents are the primary caretakers and guardians and are responsible for the upbringing of their children. It is not easy being a parent, but the situation gets difficult when children are identified with learning disabilities (Mearig, JS, 1992). The journey is not only emotionally and financially tiring but is challenging and exhausting. The entire experience is not only difficult and painful for the child, but also the parent who sometimes is unaware of their children's learning disability (ong, 2001). Parents often do not realize the gap in learning faced by their children till they reach school-going age. Lack of support from the community and schools result in great emotional trauma for the parents and children alike (Ow, 2004).

The initial response of the parents is usually seen to be negative and denial. Parents often go into a depressive phase where they keep questioning why this has happened to them and this sometimes goes on for years and years (Pain, 1990). Blaming is also another way parents try to cope up with the painful truth. Both parents blame each other for their child's learning disability (Polambo, 1995). In most cultures, mothers are usually labeled for being responsible for their child's disability. Some parents also consider their child's learning disability as a curse. The emotional well-being of these parents is negatively affected as they find themselves overwhelmed with the day-to-day challenges and struggles that go into raising children with learning disabilities. Parents experience guilt as they blame themselves or each other for their child's LD which sometimes also causes marital problems (Smith O. , 2001).

Parents want their children to excel in all aspects of life including social, academic, and family life. When children face obstacles to flourish in these aspects parents sometimes struggle to identify the root cause of this delay in their performance.

The discovery of a learning disability in a child is devastating and frustrating for the parents as they have little or no knowledge of how to help their child (Smith O., 2001). Parents often see learning disabilities as abnormalities and feel ashamed of discussing them with others (Spratt, 2007). Family support plays a vital role in the positive upbringing of children with learning disabilities. Mothers have often complained of being blamed for their child's learning disability and therefore they refrain from seeking support or sometimes even stop perusing help for their child. The constant comparison of children with LDs with those without these LDs of the same family members causes the parents to isolate and detach from their children (Scroufle, 1977).

Parents of children with learning disabilities are reportedly more stressed due to the challenging experience of providing care to their children which include health issues, emotional, greater feelings of restriction, and higher levels of parental depression. The impact is also observed on their financial abilities as it has become alarmingly high to find the most appropriate support program for their children (Singer, 1991).

The social life of parents of children with learning disabilities is quite different from those parents who do not have children with learning disabilities. Children with LDs are often considered weak social beings and are bullied not only in school but also in social gatherings (Sitlington, 1990). Parents are often criticized and blamed for their child's LD which causes them to avoid or refrain from social interactions as they feel embarrassed or ashamed of the child's behavior or poor performance in academics. It is not only the child who faces bullying, unfortunately, but our society also lacks compassion and kindness towards the distressed parents due to lack of awareness. Parents are not only bullied by their family members but also by other parents who refuse to socialize with these parents giving rise to the feeling of isolation for them (Mearig.JS, 1992).

Parents also struggle to get support and guidance from the educational institutes that refuse to take responsibility for helping the child. These parents are often left helpless with no assistance from the school administration. Examinations and assessments play a pivotal role in evaluating a child's performance but parents of children with learning disabilities need extra help or support programs from schools for their child to progress (Switzer, 1985). Most schools fail to provide support, guidance, and counseling to these parents. Parents experience frustration as they work hard and struggle to enable their child in meeting his/her academic goals. Parents have aspirations for their children to become successful but with all the limitations and restricted resources, these children cannot reach their full potential which gives rise to feelings of disappointment in parents (Ow, 2004). Even when the diagnosis is made parents find it hard to accept the stark truth of the challenges their children go through. In their constant struggle to make the best out of the given situation parents end up making mistakes in their upbringing which further worsens the situation. This also sometimes weakens the bond between parents and children and can cause them to grow distant from each other (Terman, 1984). Parents should seek emotional counseling as they grapple with these challenges. They need to be more aware of techniques to help their children prosper and progress. Help and acceptance from family, community, and educational institutes can help these parents in their difficult journey.

3. METHODOLOGY

To discover the experiences of parents having children with a specific learning disability, qualitative research using interpretative phenomenological approach (IPA), focus group discussions were used. Some of the open-ended questions asked during the focus group discussion are as follows:

What kind of a parent are you? E.g. strict, friendly, understanding, etc. What according to you are your child's strengths and weaknesses? How many times have you interacted with teachers regarding academics when your children were not doing well in academics? What difficulties did you face with the teachers or what kind of behavior was shown by the teachers? What strategies did you use to prepare your daughter for exams? We all know that all the elite schools or above-average schools have some sort of arrangements for these children but they get stuck when it comes to Cambridge or matric exams. As a parent what amendments do you want to have in our assessment system?

To have in-depth knowledge and analysis of parents with LD children, a qualitative method using interpretivism paradigms is a suitable research design. For interpretivists, the reality is fabricated by individuals of society and people's views about it. They identify that people, having different backgrounds, norms and experiences fund the building of reality that exists in their wider social context through social contact. As these human perceptions and understandings are idiosyncratic, social reality may be modified and can have numerous angles (Hennink, Hutler, & Bailey, 2011).

The objective of this phenomenological research is to explore the lived experiences of a phenomenon, in which the experiences and challenges faced by parents of LD children are explored. This method of phenomenology will emphasize the investigation of cognizant and instant lived experience and is subtle to the exclusivity of each person (Manen, 2015). The outcome of the study would be helpful for all the parents with LD children to make amendments in their parenting style.

3.1 SAMPLING AND POPULATION

The target population of this study is parents having children with learning disabilities in Pakistan. The sample participants will be purposively selected. To be suitable for this study, those parents whose children are in post-secondary grade and must be between 15 to 21 years of age were selected. Parents of children who are diagnosed with Dyslexia, Dysgraphia, Dyscalculia, and developmental disabilities like ADHD and ADD were included. Standard sampling was employed where the researcher looked for the maximum types of above-mentioned disabilities within the sample. Standard sampling is when all the cases happened to have some standard that is beneficial for the assurance of quality in a discourse (Creswell, 2019).

The criteria which were used to undertake this study was focus group discussions with five parents. When it comes to the question of the sample size there is no right answer as it depends upon the degree of commitment to the level of study of analysis and reporting, the productivity of the individual cases, and the limitations under which one

is operating (Smith & Osborn, 2007). Therefore, five participants meeting all the requirements were selected. For the selection of the participants, the researcher would be using her personal and professional contacts to find parents who meet the criteria.

3.2 DEMOGRAPHICS OF THE PARTICIPANTS:

Table 1: The following table shows the demographics of Parents having LD children

Numbers	Names (Pseudonyms)	Gender/Age	Profession
1.	Parent A	Female/46 yrs.	House Wife
2.	Parent B	Female/35 yrs.	House Wife
3.	Parent C	Female/50 yrs.	Principal of a School
4.	Parent D	Female/50yrs.	University Teacher
5.	Parent E	Male/57 yrs.	Businessman

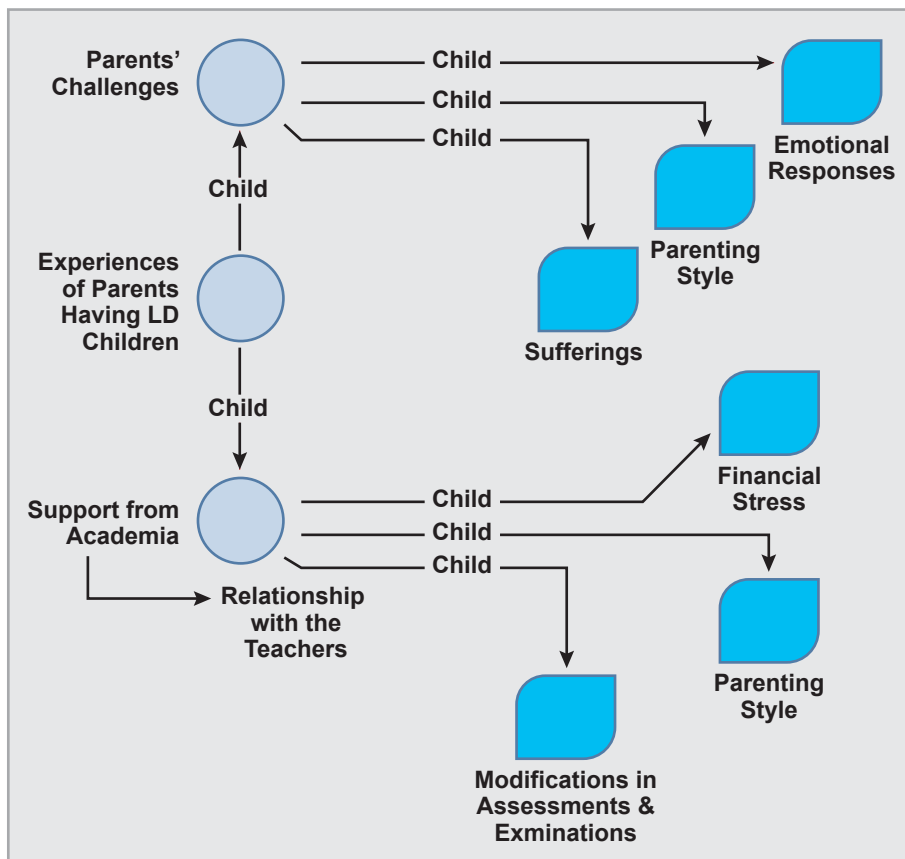
Out of the five parents in the focus group discussion, there were four mothers and one father. Two mothers were housewives, one was a Principal of a private school and one was a University lecturer. The father was a businessman. All were above thirty years of age.

4. FINDINGS AND RESULT

The findings of the present study include the major themes and their sub-themes that emerged from the research question. Due to the COVID-19 pandemic focus group discussions were conducted through zoom keeping in mind the health security of the participants as well as the researcher. The findings are in line with the following research question.

The themes originated, after the focus group discussion with the five parents, contain the struggle of the parents of LD children in preparing them to do better academically and socially. Out of the five parents who opted for the discussion, four were mothers and one father. Parent A was a School teacher and mother of Student A diagnosed with Dyscalculia. Parent B was a soft-skill trainer and mother of Student B diagnosed with Dyslexia, Parent C was a housewife and mother of a Dysgraphia boy, and Parent D was a University teacher, mother of ADHD boy, and Parent E, father of Student E diagnosed with ADD, was a businessman. Two emergent themes with their subthemes are explained below concerning the participants:

1. Parents Challenges with the sub-themes of Parenting Style, Emotional Responses and Sufferings
2. Support from Academia with the sub-themes of Relationship with the teachers, Financial Stress and Modifications in Assessments/ Examinations



When asked about their journey as a parent of an LD child, Parent E, who was a father of an ADD diagnosed child, described his journey with his son, a difficult one that sometimes seemed near but the terminus is far off. He also stated that not much research was being conducted on the parents of LD children.

“I will start by saying that this whole journey seemed sometimes too close but we know that the destination is very far off. Although much of the research is being done nowadays on LD students and their problems not much studies have been conducted on the parents of LD children.”

Studies have shown that parents of LD children face more psychological stresses than the parents of Non-LD children (Bdour, Beirat, & Al-Bustanji, 2019). Bdour et.al (2019) also states that the parents of children with any learning disability need more support in terms of their children’s educational and emotional needs.

All the parents in the focused group discussion had been facing problems with their LD children both outside and within the house environment. When questioned about their reaction to the diagnoses, the parents had mixed responses. Parent A defined it as a very painful and emotional journey. She states that she was in complete denial when confronted with the harsh reality. She even cried while narrating her journey with her LD child:

“I can never forget the day of her evaluation, when I was handed the report I was shocked and in denial. I kept thinking that how is it possible when nobody in my family has it and I do not have it either. I kept crying the whole time. I did not have a car so I was traveling in a rickshaw I kept crying in the rickshaw.”

While the research question deals with the lived experiences of parents having children with learning disabilities, the negative effects on the children due to their learning disabilities became a pivotal aspect of the research. Parents revealed that their children suffered from low self-esteem because they were constantly bullied and made to believe that they are not achievers.

Parents were asked about the support they received from the education system. They revealed that although some of the teachers tried to be supportive, sadly the education system does not have any help or support for the children. In primary classes, the children find it easy to excel but as they grow older they find themselves stuck when they appear for Cambridge or Matric exams. These examination systems do not make any exceptions for these children apart from giving extra time but they ignore the challenges in comprehension, reading, writing, and memory faced by these children. The education system does not have any exemptions for children and they are tested in the same way children without learning disabilities are tested. This puts the children under pressure and they go through high levels of stress which only adds to their struggle and challenges. The parents feel that the education system has no support for these parents and the constant struggle of their children puts added stress on the parents. They revealed that they had to spend a lot of time with their children in preparing them for exams and tests.

Parent B stated that ***“Ever since I removed him from school he feels relaxed and does not feel the pressure of tests anymore. He is at ease.”***

The parents were presented with a very important question on their experience with the teachers. Parent A said that she had received great support from the teachers and found them to be compassionate but some of the teachers she interacted with were not very empathetic and understanding of their child’s learning disability. Parent B also had some mixed experiences with the teachers as she said that being a teacher trainer herself she would know all the teachers. The teacher’s to boost the confidence of her child sometimes gave him more marks. However, the administration did not approve of it and that made her lose her emotions and would cry:

“They would be lenient with his marking but unfortunately, the whole education system does not support children with LDs. The science teacher would say that she is marking him for the concept as his concepts were clear.”

Even his Urdu teacher would give him marks regardless of the kind of sentences he made. The head office of my school would get upset with this support. Sometimes I would break down as well.”

Studies have shown that one of the reasons why students with learning disabilities leave higher education is the lack of understanding of the needs of LD students by the administrators of the school/college or the people involved in the assessment procedures (Barnard-Brak, Lechtenberger, & Lan, 2010).

Parents involved in this study had similar views. When asked about the problems they faced in preparing their LD children for the formative or summative examinations Parent A showed her dissatisfaction, more on the policies of our Government exam boards and Cambridge Boards. She was of the view that there need to be special arrangements in the curriculum as well as in the modalities of the exam papers for all LD students:

“Our government exam boards, as well as Cambridge, must cater to the needs of such kids in making the exam papers.”

5. DISCUSSION

The results of the finding after the focus group discussion with the parents of LD students showed that their whole journey with their LD children, right from the beginning of diagnosis to adjusting socially and academically, had been a daunting one. Each day is a test for them as almost every day they have to listen to the complaints of their child-related to academics or their social interactions at home or their relationship with their teachers. The results also indicated that society is more suitable for typically developing individuals than for the learning disabled ones.

The discoveries showed that out of frustration and anger some of the parents used to hit their LD child. It was mainly due to the low grades in the assessments and the parents compared the results with their non-LD children. However, all the parents in the study did admit their mistakes in handling their LD kids and tried their best to keep their learning process smooth by giving them every support. Parents participating in this study expressed their concern about the stigma that society attaches to the LD children. They get hurt when people consider their LD child as someone not to be associated with. Therefore, each one of the parents strongly condemned society in general and the school in particular in limiting their child's academic and social achievements. The findings had also shown that sometimes parents might do some acts which according to them was beneficial for their kids but actually, that act could be harmful in the long run. For instance, doing the homework by themselves instead of their child just to show the class that the child can do it. The researcher was told by Parent D, the episodes of depression after the teachers would call her and advised her to work more with the child. She felt hurt as her child had no friends at school and he used to take out his anger and frustration at home. According to the literature review, the parents of LD children get very limited support from the family, community, or school as they are the ones who label their children and bully them for being

intellectually disabled. These parents get emotionally disturbed upon seeing their LD child suffering emotionally as well as academically. As they are bullied by society and their peers at school they could not concentrate on their studies and lag behind. They are trapped in a vicious circle.

All the parents in the study reported having been suffering a lot due to the stigma attached to their children as learning disabled. This suffering is both in the child as well as in his/her parents. The lack of empathy shown by the school administration and teachers and also by the class fellows of their children had created negative effects on the LD child and his parents. The results also indicated that some of the parents of the non-LD students have been seen bullying the LD students within and outside the school environment. The findings indicated that due to the constant pressure of being accepted as other non-LD students were, the parents were of the view that this pressure was one of the barriers that affected their child's academic performance as he/she could not concentrate on their subjects. These children are mocked, labeled and often face rejection when making friends. As a result, they do face stress, depression, and social anxiety. And because of this anxiety, their academics suffer.

The results from the focus group of parents revealed that because of limited awareness about individuals with learning disabilities in Pakistan, the support from the government is also limited. The education ministry is well aware of special children and physically disabled ones but very few have a deeper knowledge about learning disabilities. However, the findings also indicated that the private schools/ colleges do cater to some extent to the needs of LD students but their hands are also cuffed when it comes to their board exams or O or A –level examinations. The literature has also indicated that it is indeed a matter of concern that the education policymakers in the Pakistan government hardly mention the students with learning disabilities. Even the Right to Free and Compulsory Education bill, 2012, which guarantees free education to all the children in the age bracket of 5-16 years, as mentioned in Article 25A of the Constitution of Pakistan, seldom indicates LD children (Singal, 2016).

The results gathered from the findings of the parent-teacher relationship were less positive and more negative. Except for parents A and B who had both good and bad interactions with the teachers of their children, the rest of the parents had bitter experiences with the teachers. The role of a teacher is to identify any student who shows any kind of learning disability (Tyagi, 2016). Tyagi (2016) further stated that the teacher must involve LD students in all the school activities and the curriculum should be designed in a way that is supportive of these students. Moreover, regular parent-teacher meetings would be beneficial for the LD students as the parents would be getting feedback about their child. All the parents talked about a few of the teachers who lacked empathy towards their children and those were the ones responsible for the developing low self-esteem in their children. However, the parents did realize that the teachers were bound with the school policies regarding the exam pattern or finishing the curriculum at a specific pace. But they were of the view that a teacher could give extra time to their child to make him understand a concept, knowing that he/she had some learning issues. A healthy parent-teacher relationship could help support the academic achievements of LD students. The results of the findings are

evidence of the fact that in a country like Pakistan with limited awareness of children with learning disabilities, it is the responsibility of the government and the school administration to organize professional development programs for teachers handling LD students. The scenario is even grave in the government schools as in those schools even the parents do not know about their child's learning disability.

6. CONCLUSION & RECOMMENDATIONS

The primary focus of this phenomenological study was, to deeply understand the challenges faced by the parents of LD children in preparing them for their academic progress. The study also proposed that parental involvement in school activities is necessary for the academic development of LD students. Constant feedback by the teachers would keep the parents in the loop and they would be able to help their children at home in preparing for their assessments. The literature review mentioned a direct relation of parental involvement to the progress of their LD children. However, in Pakistan, very few parents have the chance to get involved in their child's school. Parents participating in the research blamed the school administration, faculty, and above all the government for not taking adequate measures for taking the examination of the LD students. They suggested various ways of conducting their exams like giving objective or MCQ-based papers, taking oral exams only, or making amendments in the curriculum. By doing these arrangements students would be at ease and would come out of the pressure of failing the class.

All the participants unanimously agreed that unless the government and the governing bodies will not intervene and take up the issue of learning disabled students with interest, these students will keep on suffering and lagging in academics. They suggested that a policy needs to be made and implemented regarding the assessment of these students.

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CLIMATE-SMART INTEGRATION OF RICE AND LOCAL PALM PRODUCTION: ENHANCING RESILIENCE AND SUSTAINABILITY IN TROPICAL AGROECOSYSTEMS

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ABSTRACT

Global agricultural systems are facing serious difficulties from climate change, especially in tropical countries where the production of rice and palm is essential for both food security and economic growth. In order to improve resilience and sustainability in tropical agroecosystems, this study investigates the integration of rice and palm production systems as a climate-smart strategy. In addition to changes in temperature, precipitation patterns, and pest dynamics, the study looks into the interplay between climate change and rice and palm product. It assesses the possible benefits and drawbacks of combining agroecological approaches including crop diversification, agroforestry, and water management. In order to establish sustainable land use, lessen environmental effects, and increase the socioeconomic resilience of smallholder farmers, policy frameworks and governance structures that facilitate integrated farming systems are examined. The study additionally investigates at economic factors, evaluating the effects on local populations' livelihoods and the economic viability and market dynamics of integrated rice-palm farming. It is suggested that knowledge-sharing platforms and capacity-building programs be implemented to help the parties involved in sustainable agricultural development learn from other parties while collaborating together. By providing insights into adaptation strategies, policy interventions, and technological advancements essential for boosting resilience and sustainability in tropical agroecosystems facing climate change challenges, this study anticipates to advance the field of climate-smart agriculture strategies.

Keywords: *Adaptation, Agriculture, Climate Change, Local Palm Trees, Rice Cultivated, Thailand.*

INTRODUCTION

The Sustainable Development Goals (SDGs) of the United Nations, especially SDG 2: Zero Hunger, recognize food security as a basic human requirement. Ensuring food security and advancing sustainable agriculture are necessary to achieve this goal. However, historical agricultural practices and climate change pose serious obstacles to the world's food production, particularly in poor nations. In order to improve food security, the sustainability of the environment, and the welfare of farming communities, this study highlights how vulnerable Thai rice cultivation is to climate change and the importance of sustainable agricultural practices. In an effort to increase agricultural production, the Green Revolution brought in chemical inputs and technical innovations. Despite being effective in raising output, these methods have had a negative impact on the environment, degrading soil, contaminating water, and reducing biodiversity. By altering precipitation patterns and raising global temperatures, which in turn affect agricultural productivity, climate change makes these problems worse. The findings of Peng et al. (2004) and Zhao et al. (2017) that rising temperatures have a detrimental effect on rice yields emphasize how urgent it is to address climate change in agriculture.

Thailand, a significant producer of rice, is especially susceptible to these modifications. The Social Ecological Systems (SES) framework, which takes into account elements like resource systems (RS), resource units (RU), and users (U), offers a helpful lens through which to view the obstacles to rice production in Thailand. The resource system has notable issues, including chemical contamination, water scarcity, and deteriorating soil fertility, as highlighted by the Thailand Development Research Institute (2010) and Sirirat Trongwattanawuth et al. (2018). Further exacerbating these problems is the ignorance and lack of technology among farmers, as noted by Wannisa Wangjai et al. (2017) and Thumngong Chidchob (2011). Huai Yang Ton (HYT) Sub-district in Ratchaburi Province serves as a case study for exploring these vulnerabilities. The region's rice farming practices, both chemical and organic, illustrate the contrasting approaches to agriculture and their respective impacts on sustainability. The area's climate, characterized by seasonal rainfall and varying soil types, further complicates rice production. Notably, the use of chemical fertilizers and pesticides in conventional farming practices has led to soil degradation and reduced yields over time. To mitigate the effects of climate change, rice production must adopt a resilience approach. This entails incorporating techniques like organic farming, large-scale rice farming partnerships, potential zoning for fertilizer use, and better seed selection. These tactics not only increase output but also lessen environmental damage and support farmers' sustainable means of subsistence. According to SDG 13: Climate Action, community-based adaptation solutions are crucial, as this study highlights. Farmers in the HYT Sub-district and the province of Nakhon Pathom are adapting their methods to deal with climate fluctuation on a larger scale. This entails changing the timing of plantings, implementing sustainable farming practices, and looking for alternate water sources. Local communities are better equipped to survive climate change and safeguard their food production systems when they cultivate resilience through a variety of biological resources, production techniques, and knowledge systems. In conclusion, investigating how

vulnerable Thai rice farming is to climate change emphasizes how important it is to adopt sustainable farming methods that support the SDGs. In the face of persistent climatic challenges, addressing these vulnerabilities through resilience-building measures and community-based adaptation techniques is essential to guaranteeing food security and advancing sustainable development.

Objective of the study

1. To assess the impacts of climate change on rice production in Huai Yang Ton (HYT)
2. To evaluate the effectiveness of resilience strategies
3. To investigate the socio-economic and environmental resilience of communities in Thailand

METHODOLOGY

Secondary Study: Carry out an exhaustive analysis of the literature, research papers, and reports that are currently available about the effects of climate change on Thai agriculture, with a particular emphasis on rice production and the function of local Thai knowledge. The response of palm trees to climate change.

Qualitative Approaches: Interviews with key informants in the area, such as farmers, regional specialists, extension agents for agriculture, and local leaders.

Case Study Location: Ban Lat District in Phetchaburi Province and Huai Yang Ton Sub-district in Pak Tho District in Ratchaburi Province

Data Analysis: Using content analysis, investigate how the community's adaptive tactics and rice agriculture are affected by climate change.

Exploring Climate Change Vulnerability in Thai Rice Farming

Food is a human need. Zero hunger is part of the Sustainable Development Goals (SDGs) by the United Nations. More importantly, food security and production safety should be aware of the implementation for better production, environment, and life. The world's food production in several countries, especially developing countries, is facing insecurity due to the Green Revolution and climate change. Though the green revolution used technology and chemical substances to overcome a challenge, the yield was unsafe and had environmental impacts. Climate change affects the precipitation (e.g., freshwater, rain, and snow). The world temperature is rising greenhouse gases, which consist of Carbon dioxide (CO₂), Methane (CH₄), and Nitrous oxide (N₂O). Peng, Huang, Sheehy, Laza, Visperas, Zhong, Centeno, Khush, and Cassman (2004) said that the rice yield decline when the world temperature is increased, consistent with Zhao, Liu, Piao, Wang, Lobell, Huang, Huang, Yao, Bassu, Ciais, Durand, Elliott, Ewert, Janssens, Li, Lin, Liu, Martre, Müller, Peng, Peñuelas, Ruane, Wallach, Wang, Wu, Liu, Zhu, Zhu, and Asseng (2017) who reported that climate change, as well as temperature and precipitation changing, influences on productivity.

Barriers to rice production can be explained using the Social Ecological Systems framework, which includes the resource system (RS), resource unit (RU), and user (U). RS is caused by chemical contamination in cultivation areas and occurs during transportation (Sirirat Trongwattanawuth, Piyawan Siriprasertsin, & Chaiwat Baimai, 2018). Climate change is causing a scarcity of previously unavailable production inputs, such as water and natural resources (Sirirat Trongwattanawuth et al., 2018; Thailand Development Research Institute, 2010). RU has not changed the land used, but inputs (seeds and fertilizers) have increased. Furthermore, soil fertility in rice production areas is declining because the substance must be balanced when used and maintained. Previously, fertilizer ratios were utilized to analyze soil textural qualities, which were different and unrelated to soil potential. U consists of Lack of knowledge, is confirmed by Thumnong Chidchob (2011); Wannisa Wangjai, Benchamas Yooprasert, and Ponsaran Saranrom (2017) found the pre-harvesting phase is characterized by a lack of understanding about rice cultivation (for example, water management, weed management, fertilizer use, plant diseases, and harvesting methods). The post-harvest phase includes rice processing and storage. Sirirat Trongwattanawuth et al. (2018) stated that information flow is non - connecting data for personalized retail plans that alter rather than forecast demand. Lack of technology - agricultural machines were discovered during the pre - harvesting and distribution phases. The Thailand Development Research Institute (2010) supported the Lack of Labor report, which identified the problem of upstream production.

Rice Production in Huai Yang Ton (HYT) Sub – district, Ratchaburi Province

Ratchaburi Province is located in the Western Region, divided into eleven districts. There were approximately 1.50 million rai (Land Development Department, 2023). Ratchaburi province's annual rainfall ranged from 8.70 to 29.08 millimeters ($X = 14.39$), with the rainy season occurring from March to October (Data Innovation and Governance Institute, 2022). Soil groups were 1, 6, 18, 36, 48, 49, 56, 60, and 62, respectively, with low soil fertility and organic matter, fine - loamy soil, and slightly acid ($pH \approx 5.5 - 6.5$) (Land Development Department, 2024). The agricultural area consists of Excellent (Yellow Zones), High (Pink Zones), and Low (Orange Zones) Potential Cultivation. The Excellent Potential Cultivation to grow rice is mostly in Photharam District, which covers approximately 0.12 million rai. Meanwhile, The High Potential Cultivation is mostly located in Pak Tho District as shown in Figure 1.

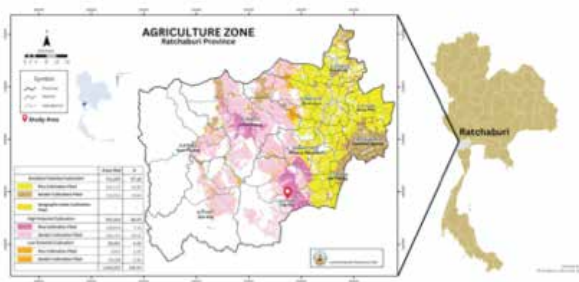


Figure 1: Agriculture zone, Ratchaburi province
Source: Land Development Department, 2023.

Soil Preparation	2. Chemical fertilizers containing nitrogen, phosphate, and potassium are applied twice a year during the rainy season, in May and June, as well as in August. Soil preparation involves using organic fertilizer, manure, or plant fertilizer (Crotalaria juncea), or bio - fermentation.	Soil preparation involves using organic fertilizer, manure, or plant fertilizer (Crotalaria juncea), or bio - fermentation.
Planting	Pesticides and herbicides are also used to protect crops, particularly during planting.	Microbial pesticides (<i>Trichoderma harzianum</i>) are also used to protect crops, particularly during planting.
Harvesting	Harvesting rice takes approximately four to five months, depending on the climate.	

Resilience Approach in Rice Production

Previously, HYT's farmer - determined fertilizer ratios by evaluating soil textural features rather than soil potential. Also, HYT's chemical rice production areas have not changed land use, but inputs (seeds and fertilizers) have increased. Furthermore, soil fertility in rice production areas has decreased since soil fertilizers must be balanced, used, and maintained. Hence, the resilience approach in rice production is appropriate for this case as seen in Table 2.

Table 2 Resilience Approach in HYT’s Rice Production

Approach	Description	Reference
Rice Production by Potential Zoning	Rice cultivation yield increases as fertilizer is applied based on soil potential.	Rice Department, 2013
Organic Rice Production	1. Organic jasmine rice production reduces resource use, has a lower environmental impact, and increases product value. 2. Organic jasmine rice cultivation yields were significantly higher than chemical jasmine rice production.	Jirapornvaree, I., Suppadit, T. and Kumar, V., 2021

Large - scale Rice Farming	Farmers in the region collaborate to produce rice. This decreases expenses while increasing production efficiency.	Assavarak, P., Seeprasert, P., and Jirapornvaree, I., 2024
Seed Selection	Seed selection is a critical factor in rice production. RD95 rice seeds are eligible for selection for cultivation in this area. The result of this study found RD95 can produce the yield, approximately 0.8 to 1.0 tonnes/rai/crop. Compared to RD105, the yield can be around 0.5 tonnes/rai/crop.	
Form of Participation in Rice Supply Chain Management	<ol style="list-style-type: none"> 1. Three perspectives on connecting stakeholders in Rice Supply Chain include information flow, product quality, and production costs. 2. Farmer should focus on production quality rather than quantity. 3. Rice processor and distributor operated by fair price mechanism. 4. Consumer sent the feedback information to the both for continuous improvement. 	Thumnong Chidchob, 2011

Table 2. explained that despite the climate change issue, farmers must improve their ability to cope with change through integrated production management. Additionally, HYT’s farmers must plan their produce and calculate the cost, especially in rain-fed agricultural areas, to reduce the risk of loss and future debt.

The concerning pattern of rice productivity declines due to environmental changes linked to climate change is consistent with research on climate change adaptation among growers of major cash crops in the Nakhon Pathom province, Thailand.

This research emphasizes the main problems farmers face: temperature variations, disease and pest outbreaks, and flooding. Farmers are responding to these challenges by implementing a variety of measures, such as revising planting schedules, transitioning to sustainable agriculture, seeking alternate sources of water during dry spells, and changing the types of crops grown (Jirattinart Thungngern et al., 2023).

The sustainable development concepts provide the foundation for community-based climate change adaptation using several frameworks. Communities employ a variety of biological resources, production techniques, knowledge types, and revenue sources to manage climatic fluctuations and extremes. This method of relying on diversity improves the ecological, social, and economic resilience of local communities by expanding the range of adaptation options available across various spatial and temporal dimensions.

Climate Resilience of Local Palm Trees in Thailand

Although palm trees have long been associated with the tropics, they are currently facing new difficulties due to climate change. Notwithstanding these challenges, palm trees are demonstrating incredible resilience and flourishing in new habitats. They are adapting significantly, one of which is by being able to withstand a wider variety of temperatures. Numerous palm species are expanding their geographic ranges in response to global warming. Furthermore, as a result of rising temperatures and atmospheric carbon dioxide concentrations, palm trees are expanding more quickly. Their rapid growth enables them to outcompete other species for resources and establish themselves in new settings quickly.

There are around 161 native palm species in Thailand, which are categorized into 33 genera. Two infraspecific taxa and sixteen species are native to the nation. Thailand's climate, which spans 511,731 km², is distinguished by a latitudinal gradient of temperature and precipitation as well as a longitudinal gradient of precipitation. Peninsular Thailand, which is bounded to the east by the Andaman Sea (Indian Ocean), to the west by the Gulf of Thailand, and to the east by a portion of the South China Sea, is home to 80 percent of all Thai palm species. The majority of species in the north can be found in the montane forests that border Burma, Laos, and Cambodia. In Thailand, palm trees are used for many different things. They are a major source of food and shelter for rural inhabitants. This study addresses the native wisdom palm tree found in Thailand, emphasizing their adaptability and resilience to the environmental and socioeconomic difficulties posed by climate change.

Challenges of the Palmyra palm (*Borassus flabellifer*)

The palmyra palm (*Borassus flabellifer*), which grows all over Thailand, is essential to the regional economy. It lives a very long time and starts reproducing at the age of 12 to 15. Because it is a dioecious plant, the male and female specimens are different. The palmyra palm is crucial to the Ban Lat District of Phetchaburi province's efforts to adapt to climate change. The district's primary assets include its physical layout, historical significance, and tradition of using palmyra palm products. Culturally significant is the palm sugar production heritage in Phetchaburi Province, commonly referred to as the 'Muang Phet, City of Palmyra Palm.' A 2007 survey found that there

were 300,355 palmyra palm trees in Phetchaburi Province, with 73,858 of those trees—or 24.59 percent of the total—located in Ban Lat District. The knowledge of palm sugar production is crucial for career development in this field, turning it into an economically viable crop that provides income for the local community. Palm local wisdom, which varies by locality, includes unique characteristics, methods, and practices, all of which hold important cultural and commercial value. Understanding the production of palm sugar is essential for advancing one's career in this field and making palm sugar a sustainable crop that boosts the local economy.

It was noted that farmers are boosting their rice cultivation while decreasing their production of Palmyra palm sugar as a means of responding to economic, technological, and social demands. Traditionally, farmers would rotate between producing palm sugar and rice once a year. Farmers no longer have time to make palm sugar because rice is now farmed twice a year. As a result, many people have given up on this habit. Moreover, the twice-yearly farming results in water retention throughout the year, which causes sugar palm trees planted beside rice fields to eventually die off. Additionally, they are altering their production processes by substituting less expensive melt sugar with more costly real Palmyra palm sugar. Regarding the efforts to maintain the production of Palmyra palm sugar, the data indicates that the conventional method—which uses palm material from trees planted in rice fields—is deteriorating and may disappear in the next thirty years (Angkavanich & Nitjaran, 2013).

Not only is there a risk of losing biodiversity due to changing planting patterns, but socio-economic factors also pose a threat. The expertise and cultural heritage associated with palm sugar production are at risk due to a generational gap, as most individuals skilled in this craft are over 50 years old (Kamnuansin, 2019). The number of people engaged in palm sugar-making has decreased, causing the wisdom associated with palm trees to fade away. This emphasizes the need for sustainable development and resilience within the community. Government agencies and community leaders are aware of these problems and are working to find sustainable solutions to preserve and develop the palm sugar occupation (Nokkaew, 2021). In Ban Lat District, Phetchaburi Province, which consists of 115 villages in 18 sub-districts, only 291 people are currently engaged in palm sugar production.

“...It takes time for one Palmyra tree to regrow fully and produce quality products. Typically, it requires a minimum period of 15 years before it begins yielding high-quality output....” said the headman of Rai Krang village.

In an interview, the local headman stated that the production of palm sugar is currently the principal profession of approximately 11 households in Rai Krang local. Furthermore, about ten workers are engaged in climbing and harvesting duties. Participants in these activities range in age from a minimum of around 22 years old to a maximum of about 80 years old.

Because of the vast traditional knowledge of Palmyra palm products—which are now essential to community livelihoods—there are several economic options.

The community's ability to respond to shifting environmental conditions and economic challenges is strengthened by this economic diversification. Renowned for its adaptability, the Palmyra palm is an essential source of income for many underprivileged people. Different sections of the palm are used to make different goods. A representative from Rai Krang Village stated that female Palmyra palm trees yielded approximately 4,500 THB (equivalent to 125 USD) per tree per harvest, while those working in climbing and harvesting tasks are paid about 50 THB (1.5 USD) per tree, with a maximum capacity of about 8 trees per day. Value-added goods, such as palm sugar, can support economic viability. In addition to their nutritional and therapeutic benefits, these items are important sources of employment and income, especially for underprivileged groups involved in their cultivation and sale (Srivastava et al., 2017).

In conclusion, the traditional practice of palm sugar production is declining due to changing agricultural practices, economic pressures, and a generational gap in knowledge. The decreasing number of individuals engaged in this craft, particularly in Ban Lat District, underscores the need for sustainable development and community resilience. Government agencies and community leaders are actively seeking solutions to preserve and develop palm sugar production. The palmyra palm's adaptability and economic potential, including its role in providing income for underprivileged groups, highlight its importance. Sustaining this tradition is crucial for maintaining biodiversity, cultural heritage, and economic stability in the region.

In Thailand, the Palmyra palm (*Borassus flabellifer*) is an important ecological component because of its remarkable tolerance to drought, ability to prevent landslides, ability to sequester carbon, and ability to maintain biodiversity. Palmyra palms are well-known for growing well in arid climates. Their large root systems help to prevent soil erosion and promote water retention. The numerous environmental advantages of the palmyra palm highlight how crucial it is for fostering resilience and sustainability in regional ecosystems.

According to Ali-Dinar et al. (2023), the Palmyra palm (*Borassus flabellifer*) thrives in arid settings, making it essential for areas experiencing drought issues that affect agricultural sustainability. Due to their deep root systems, these palms help retain water and reduce soil erosion, making them ideal for regions with variable rainfall patterns. Research conducted in Odisha, India (Behera et al., 2021), shows that alluvial soils with optimal pH, high amounts of organic carbon and moisture, and moderate temperatures are ideal for Palmyra palm growth and yield. Palmyra palms are the predominant perennial component in Nalgonda, Andhra Pradesh, India (Osman et al., 2000). Their adaptability in providing a variety of products in addition to sugary juice supports lucrative agriculture in drylands.

As mentioned earlier, in addition to drought resistance, the robust root systems of Palmyra palms are pivotal in stabilizing soil and reducing the risk of landslides, especially in hilly or sloped terrain. These palms act as natural barriers, effectively preventing soil erosion and enhancing overall environmental stability. Aroonsrimorakot et al. (2021) highlight that the extensive root system of sugar palm trees, reaching depths of up to 15 meters, offers a practical approach to mitigating

landslides and erosion along riverbanks when strategically planted along roadsides and canals in Thailand. This approach provides an eco-friendly alternative to traditional concrete barriers funded by substantial government allocations for erosion control. However, the successful implementation of such strategies requires meticulous planning, continuous maintenance, and community support, underscoring the need for policymakers and management teams to collaborate effectively to establish sustainable defenses against natural disasters.

Because they absorb and store carbon dioxide, palmyra palms are essential for carbon sequestration, which reduces greenhouse gas emissions and fights climate change. Studies carried out in diverse locations have evaluated the capacity of Palmyra land use to sequester carbon across a range of soil types. The results have indicated differing concentrations of soil organic carbon and biomass carbon stocks, with the highest concentrations being found in the uppermost soil layers. Research conducted in the province of Phetchaburi revealed that palm plantations and natural regions had noteworthy capacity to store carbon, with mean carbon levels of 30.84 ± 2.59 kilograms and 37.08 ± 2.28 kilograms, respectively (Gnanavelrajah et al., 2023; Pattamaporn Yodsanti et al., 2020). These results highlight the role that Palmyra palms play in environmental conservation initiatives by efficiently capturing and storing carbon.

According to one of the informants, “...*I will use a palm sugar knife to thinly slice the tips of the male palm flowers, allowing fresh sugar to flow out, and I will use hanging containers to catch this fresh sugar....*” This practice ensures that male flowers of sugar palm trees are deliberately removed before blooming to benefit sugar tappers, as flowering palms attract crucial pollinating insects that are scarce in heavily taped areas.

Because palmyra palms are essential habitats and resource sources for a variety of species, they promote ecological balance and greatly enhance local biodiversity. Adhering to traditional knowledge in sustainable harvesting practices is essential for biodiversity conservation as it prevents overexploitation from depleting the resource. According to a study, there are 50 insect pollinators that thrive among sugar palms in natural forest environments. This highlights the importance of protecting these habitats in order to promote pollination activities and preserve the health of the ecosystem as a whole (Susanti Withaningsih and Haifa Nurislamidini, 2021).

Other than cultivating sugar palms in Phetchaburi province, various areas across Thailand feature indigenous palm species, such as the Sago palm (*Metroxylon sagu* Rottb.), native to Southeast Asia and Oceania. These palms are culturally and economically important in Thailand, especially in southern provinces like Nakhon Si Thammarat and Phatthalung, where they exhibit potential for climate adaptation. They play crucial roles in both local agriculture and ecological systems. Nearly all parts of the sago palm find use: its sucker and young leaves are edible, the bark serves as flooring or fuel, seeds are decorative, and the pith is used in animal feed or food processing. Despite its versatility, Thailand lags behind neighboring countries like Malaysia and Indonesia in sago palm cultivation and utilization. Economic studies highlight significant benefits from utilizing sago palms, particularly in Nakhon Si

Thammarat, where leaves are the most economically valuable part, contributing annually to substantial incomes. Age and utilization type significantly influence economic productivity, with older trees being more profitable, primarily through starch production and as a food source for sago grubs. However, challenges persist, especially in managing younger trees to sustain sago palm forests (Wattananarong Markphan et al., 2016, Wichit Charungsutjaritkul et al., 2017). The study conducted in Yala, Pattani, and Narathiwat aimed to assess the current status and distribution of sago palm (*Metroxylon sagu* Rottb.) forests using observational methods, interviews, and focus groups across 199 sub-districts. Findings indicated that sago palms thrive in swampy, waterlogged, and occasionally rocky environments, often growing alongside other trees. Narathiwat showed significant sago palm coverage with over 1 million square meters and a majority of trees. Most sago palm forests in these provinces were privately owned, and a substantial portion was deemed to be in good condition. The study underscores the importance of sustainable conservation efforts by local communities and stakeholders to ensure the preservation of sago palm forests for future generations (Wilaiwan Kaewtathip et al., 2018).

The research conducted in Nakhon Si Thammarat province on sago palm forests explored their utilization, aquatic biodiversity, and water quality. Sago palm leaves are commonly used for roofing, while the trunk serves as feed for animals and sago worms, contributing economically. The fish community in these ecosystems showed high diversity with 74 species across 9 orders and 24 families. Phytoplankton diversity varied between dry and wet seasons, reflecting 21-32 genera and 22-28 genera respectively. Water quality assessments indicated a mesotrophic to meso-eutrophic status suitable for aquatic life despite varying trophic levels (Suriya Chankaew et al., 2014). Another study on algae diversity in the same area highlighted significant variation with 100 genera and 210 species identified across five divisions (Manthaka Weeraphong et al., 2016).

This study emphasizes the potential of integrating two palm tree species and indigenous knowledge in Thailand to combat climate change through ecological, economic, and cultural strategies, serving as a model for sustainable development in comparable regions. The Palmyra palm (*Borassus flabellifer*) is crucial to Thailand's economy, particularly in Phetchaburi province's Ban Lat District, renowned for its palm sugar production heritage. Despite challenges such as declining traditional practices and economic pressures favoring rice cultivation over palm sugar, efforts are underway to sustain and develop palm sugar production. Meanwhile, the Sago palm (*Metroxylon sagu* Rottb.), found in southern Thailand, holds cultural and economic significance, despite lagging cultivation compared to neighboring countries. Studies underscore its versatile uses and economic benefits, urging sustainable conservation to ensure its ecological and economic contributions endure for future generations, providing a model for sustainable development in similar areas.

Discussion

The vulnerability of rice farming in Thailand to climate change is a significant concern, particularly in the context of sustainable development goals (SDGs). The United Nations' SDG 2, which aims to end hunger, achieve food security, and promote sustainable agriculture, underscores the importance of addressing these

vulnerabilities. This research highlights several critical aspects that need to be considered to enhance the resilience and sustainability of rice farming in the Huai Yang Ton (HYT) sub-district of Ratchaburi Province.

Climate Change and Rice Production

Climate change poses a profound threat to rice production, as evidenced by the impacts on precipitation patterns and temperature increases. The findings of Peng et al. (2004) and Zhao et al. (2017) align with this study, indicating that rising temperatures and altered precipitation patterns negatively affect rice yields. In HYT, farmers face challenges such as water scarcity, reduced soil fertility, and increased input costs, which are exacerbated by climate change. The reduction in yield not only threatens food security but also the economic stability of farming communities reliant on rice production.

Social Ecological Systems Framework

The application of the Social Ecological Systems (SES) framework provides a comprehensive understanding of the barriers to rice production in HYT. Chemical contamination and the overuse of fertilizers have degraded the resource system (RS), leading to long-term environmental damage. The resource unit (RU) has also been affected, as the continuous use of chemical inputs without considering soil potential has led to decreased soil fertility. The user (U) aspect highlights the lack of knowledge and technology among farmers, which hampers their ability to adapt to changing conditions and optimize production practices.

Resilience and Adaptation Strategies

Resilience approaches in rice production, as demonstrated in HYT, offer potential pathways to mitigate the impacts of climate change. Implementing practices such as potential zoning for rice cultivation, organic farming, and large-scale farming can enhance productivity and environmental sustainability. The success of organic jasmine rice production, which reduces resource use and increases product value (Jirapornvaree et al., 2021), suggests that similar strategies could be effective in HYT. Additionally, collaborative farming efforts can reduce costs and improve efficiency, providing a model for scaling up these practices. Resilience strategies in palm production are essential to mitigate the impacts of climate change and ensure long-term sustainability. Agroecological practices, such as intercropping, cover cropping, and maintaining biodiversity, can improve soil health and reduce pest outbreaks. These practices not only enhance the resilience of local palm plantations but also contribute to the broader ecological health of the region (Garrett et al., 2017).

Community-Based Adaptation

Community-based adaptation (CBA) strategies, rooted in sustainable development principles, are crucial for enhancing the resilience of local communities. By leveraging local knowledge and diversifying agricultural practices, communities can better manage climatic variability and extremes. The study on climate change adaptation among farmers in Nakhon Pathom province (Thungngern et al., 2023) illustrates the importance of adjusting planting calendars, seeking alternative water sources, and modifying crop types to cope with changing environmental conditions. Similar CBA approaches could be applied in HYT to strengthen local resilience.

The policy recommendations

1. **Promotion of Organic Farming:** Encourage and support farmers in HYT to adopt organic farming practices similar to the successful model of organic jasmine rice production. Organic farming can improve soil fertility, reduce dependency on chemical inputs, and enhance product value, contributing to both environmental sustainability and economic stability.
2. **Implementation of Climate-Resilient Agricultural Practices:** Introduce potential zoning for rice cultivation based on climate suitability assessments. This approach helps farmers optimize planting decisions and reduce the risk of crop failure due to climate variability. Additionally, promoting large-scale farming and cooperative efforts can help consolidate resources and increase efficiency in water and input use.
3. **Community-Based Adaptation (CBA) Strategies:** Facilitate community-led initiatives that leverage local knowledge and diversify agricultural practices. Encourage HYT farmers to adjust planting calendars, explore alternative water sources, and diversify crop types to enhance resilience against changing climate conditions. Providing support for these adaptive measures through local institutions and partnerships can amplify their effectiveness.
4. **Community Engagement and Benefits Sharing:** Ensure that local communities benefit from local palm production through equitable employment opportunities, revenue-sharing schemes, and community development projects. Implement policies that require palm production companies to engage with local communities, respect indigenous land rights, and contribute to local infrastructure and social programs.
5. **Research and Development Investment:** Allocate resources towards research and development aimed at developing climate-resilient palm varieties. This includes breeding programs focused on drought resistance, disease tolerance, and improved nutrient uptake. Support collaborative research efforts between universities, research institutions, and palm production companies to accelerate innovation in sustainable palm cultivation.

Future research

For future research on climate-smart integration of rice and local palm production: enhancing resilience and sustainability in tropical agroecosystems could be explored:

1. **Integrated Land Use Planning:** Research on integrated land use planning strategies that optimize the coexistence of rice farming and local palm production. Investigate spatial planning approaches that balance agricultural productivity, biodiversity conservation, and ecosystem services to minimize environmental impacts and maximize socio-economic benefits.
2. **Economic and Social Dimensions:** Investigate the economic implications of integrating rice and local palm production systems, considering market dynamics, profitability, and livelihood impacts for smallholder farmers and local communities. Analyze the social acceptability and adoption barriers of integrated farming approaches among different stakeholder groups.

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EMPLOYING CULTURAL TOURISM TO PROMOTE SUSTAINABLE DEVELOPMENT: INSIGHT FROM GALLE FORT AND KOT DIJI

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ABSTRACT

Cultural tourism refers to the mutual motivation of the visitors toward learning and appreciating historic places. It is closely connected to the sustainable approach, efficient management of heritage sites, built environment and social customs of these locations. However, the relations among these complex phenomena and unplanned tourist activities are always challenging to manage with large scale heritage sites. Sustainable cultural tourism has become an increasingly important topic in recent times. In this context, this study explores the intricate connection between cultural tourism and heritage management in augmenting the sustainable development of heritage sites. This idea can be referred to as 'cultural sustainability' in heritage conservation. It is argued that integrated management of heritage sites, social inclusion of communities, and informed tourism activities intersect to conserve a more sustainable tourism of heritage sites. The management and the practices to maintain heritage site, during the recent years has brought several challenges, contributing directly to economic, environmental, and social challenges. With the demand for more resilient cities and communities, it is crucial to explore how cultural sustainability can contribute to positive outcomes. This research explores cultural tourism and sustainable development by employing the notion of integrated management to identify its crucial role in promoting cultural conservation, enhancing community participation, and supporting social sustainability within heritage sites. It specifically examines the influence of strategic planning of sustainable tourism approach on communities and consequently on heritage sites, by looking into two

case studies. They are the Galle Fort of Sri Lanka and the Diji Kot Fort of Pakistan. It employs constructivist grounded theory and collects and evaluates data from the above two sites. The inductive process enables the formulation of ideas based on archival data, resulting in a detailed comparison of the phenomena under investigation. The study utilizes qualitative methodologies, such as archival research, site visits and personal notes to collect data from the sites. The findings demonstrate that informed tourist activities greatly affect the sustainable approach, and associative experiences in the heritage sites. It further reveals that integrating cultural management into heritage conservation initiatives promotes social sustainability and contributes to achieving broader sustainable development objectives. The research offers insights into developing sustainable and authentic tourist experience that could conserve heritage sites while creating a sense of ownership for all stakeholders, by incorporating community engagement into heritage conservation efforts. Hence, the overall cultural sustainability, how tourism receives feasibility regarding its management practices with community involvement should be considered alongside other policies and techniques. This study will create new knowledge and evidence for facing the challenges of today's cultural tourism towards sustainable development goals. These findings suggest considerable improvement in heritage conservation of the region when weighed against the increased demand of cultural sustainability.

Key words: *cultural tourism, sustainable development goals, heritage sites, Bahrain, Sindh.*

1. INTRODUCTION

The maintainable advancement of tourism has been the center of numerous logical ponders within the tourism paradigm since the late 20th century. Concurring to Buckley (2012), appropriate tourism lead to regional improvements regarding the natural values and tourism objectives, the worth of visitor encounters, as well as the social and cultural backgrounds of neighborhood individuals. Sightseers going to developed areas is one of the most seasoned shapes of tour and with chances to essentially progress economically for those areas (Murillo et al., 2013). Past research has informed that numerous cities found this financial potential and acknowledged it as a important zone inside their economies since 1980s (Rogerson and Rogerson, 2014). Undoubtedly, a predominant improvement procedure in urban areas has been supporting tourism as a driver for financial advancement. Developed countries have been restoring and apprising their recreational places that have potential to be profitable (Rogerson and Rogerson, 2014). Other research shows how these regions de-industrialize their main cities and started arrangement intrigued in tourism to present unused development divisions. Subsequently, such areas which have achieve high tourism with unused organize of pertinence due to increased projection within their state strategies rehash underneath advertisements, postmodern move, and the associated rebuilding economy of those areas (Nyerere, 2020).

Despite the numerous obstacles, developing countries have opportunities for growing socially and economically, while developing their regional and cultural tourism (Musavengane et al., 2020). The complex relationship between sustainable tourism, heritage conservation and management of historic sites, requires a delicate balance for long-term destination viability (Loulanski and Loulanski, 2011). Effective collaboration among stakeholders is essential, emphasizing responsible travel behaviors, cultural sensitivity, and community empowerment (Roxas et al., 2020). While sustainable tourism holds promise for inclusive growth, challenges such as unequal distribution of benefits and environmental degradation necessitate strategic interventions. Addressing these challenges requires implementing fair trade practices, supporting local enterprises, and enforcing sustainable policies (Gupta et al., 2024). The relationship between sustainable planning and heritage conservation has historically been compartmentalized, leading to the need for integration of policies and objectives (Appendino, 2017a). While both are essential, they have often operated independently, creating potential conflicts. Bridging these spheres is crucial to achieve an integrated approach that effectively marries heritage conservation with urban sustainable development. On the other hand, certain authors acknowledge these challenges while emphasizing the responsibility of the conservation field. They argue that conservation professionals have not effectively connected their work to sustainability and quality of life issues. There's a call for greater engagement and dialogue with stakeholders from various disciplines who share similar concerns but offer different perspectives (Appendino, 2017b; Gössling, 2018; Salazar, 2012).

Subsequently, to discover out the challenges of executing maintainable tourism improvement procedures and arrangements, with a set of creating data on information of the economic improvement challenges among partners. The research aims to consider two destinations to produce data on information of the economic advancement procedures and approaches that are being implemented by tourism partners within the Galle Fort of Sri Lanka and the Diji Kot Fort of Pakistan; and distinguish the opportunities and difficulties confronted by tourism partners and stakeholders in accomplishing a tourism sustainability in these fortification cities. These destinations will contribute to the realization of the important point, and the research investigates about the tourism advancement techniques and approaches being actualized by tourism stakeholders, and the challenges encountered by people accomplishing tourism sustainability.

2. LITERATURE REVIEW

2.1. Impact of Unplanned Tourism Activities on Cultural Heritage

Given that tourism, which is playing a vital role in driving global economic growth, has undergone remarkable expansion in recent decades. Being an industry that intersects with economic, social, and environmental aspects, there's a pressing need for sustainable development within tourism. Recognizing the interconnectedness between tourism and the environment, various stakeholders, policymakers, and the tourism industry have increasingly stressed the importance of adopting sustainable practices (Gupta et al., 2024). Positive tourist feedback can draw more visitors to destinations, but excessive tourism can lead to social and environmental degradation.

Overcrowding may damage cultural heritage, while commercialization can compromise authenticity (Garrod, 2012). Proper preservation is crucial for sustaining cultural tourism experiences and avoiding long-term sustainability decline. To achieve sustainable cultural tourism, it's essential to manage tourist numbers and minimize negative impacts, despite the temptation for maximum economic gain often prevailing in tourism projects (Liu and Shu, 2020). Mass tourism is frequently accused by the media of causing irreversible harm to cultural heritage sites. Examples include the tomb of Tutankhamun in Egypt and Buddhist pagodas in Myanmar, both of which have suffered significant damage due to excessive numbers of visitors. In some cases, authorities have restricted access to these sites after initial exploitation, while in others, measures to mitigate heritage damage were implemented too late to prevent permanent depreciation. Venice has also been highlighted as a concerning case by The Economist's Editorial Board (Chenavaz et al., 2022). In addition to recognizing the broader impacts of heritage on local environments, it's crucial to consider factors such as transaction costs, the distribution of costs and incentives from heritage tourism, and the most efficient organizational modes from economic, social, environmental and cultural perspectives. Institutional frameworks, public strategies, investments, and projects play significant roles in shaping the impact of heritage tourism. It's essential to acknowledge that different actors may compete for the use of heritage resources, leading to issues of resource allocation. Furthermore, heritage tourism activities can generate both positive and negative externalities, which may be addressed through institutional arrangements. Viewing heritage tourism from this perspective involves assessing the possible and desired direct and indirect impacts of formal institutions and stakeholders, including public authorities at various levels and networks of private actors, on the development direction of heritage tourism (Murzyn-Kupisz, 2012).

2.2. Sustainable Development

Urban heritage conservation and sustainable development are intertwined concepts that have evolved over the past three decades, representing a critical imperative for our era (Nocca, 2017). Cultural heritage is increasingly integrated into various public development strategies at different levels, such as local, regional, and national levels, as it is seen as an asset for contemporary socio-economic development (Timothy, 2014). This inclusion presents significant opportunities for territorial units to undertake projects related to the conservation, restoration, and adaptation of heritage sites, as well as the preservation of intangible heritage. However, it also poses substantial challenges, particularly in achieving sustainable development in certain areas, especially when considering both quantitative and qualitative aspects of development comprehensively (Murzyn-Kupisz, 2012). Despite its significance, there remains a lack of a universally accepted definition for sustainable development, leading to ambiguity and vagueness. This ambiguity is exemplified in the influential 1987 Brundtland Report, which defines sustainable development as the ability to meet present needs without jeopardizing the ability of future generations to meet their own needs (Appendino, 2017b). Originally founded on three pillars—environmental, economic, and social dimensions—sustainability has undergone a transformative evolution over time, becoming a more intricate and holistic concept, owing to contributions from international debates and gatherings (Appendino, 2017b; Ruggiero, 2021).

2.3. Cultural Tourism

Cultural heritage and cultural tourism share a symbiotic relationship, with heritage serving as a primary attraction for cultural tourism. Cultural tourism, in turn, provides financial support and raises public awareness for heritage conservation efforts. This paper aims to explore the interconnectedness of three central concepts: cultural heritage, cultural tourism, and sustainability. At the core of sustainable cultural tourism is the preservation of cultural heritage values, which begins with defining conservation concepts and analyzing effective conservation practices. Cultural tourism is differed from the recreational tourism where the essence of the visited destinations are always appreciated (ICOMOS, 1999) . They serve as a fusion of tangible and intangible heritage, providing a rich context to comprehend the intricate relationship between humans and their environment. Cultural tourism is commonly understood as a sociocultural interaction among individuals, facilitated and influenced by a diverse array of actors including planners, politicians, researchers, marketing professionals, and travel agencies.

2.4. Heritage Management

Heritage management is the process of managing cultural properties through identification of heritage, interpretation, maintenance and conservation of physical sites as well as managing of intangible aspects of cultural heritage (Ababneh et al., 2016). Heritage management requires the element of truthfulness so that it is relatively simpler to discern if heritage sites require our utmost attention to detail. Simply put, if truthfulness is not embraced, we lose reliability, an error that can overshadow our historical narratives. According to Liu et al. (2019), modern urban conservation practice which has emerged in Europe in the nineteenth century, has since progressed from preserving monuments to preserving historic districts to now conserving the entire historic cities. Climate change, urbanization, market exploitation, mass tourism, and other factors have increased the pressures on urban heritage since the twenty-first century. Hence, in the face of everchanging urban scenarios, it is of critical importance to focus on integrated conservation management along with informed tourist activities, which may be able to integrate the sustainable development.

2.5. Community Engagement

Stakeholders in the tourism industry have an impact on its development, and up-keeping and policy-making processes (Matiku et al., 2021). Throughout the lengthy process of investigating operational strategies for sustainable heritage tourism, the host community has been repeatedly mentioned as a key component (Du Cros, 2001; Liu et al., 2013; Salazar, 2012). It would be impossible for heritage tourism businesses to set up transparent institutional structures and to fairly and equally divide costs and benefits among stakeholder groups without the active involvement and participation of local communities. The host community is defined in this study as all the stakeholder groups at a heritage site who share an interest in tourism operations. Stakeholder groups that may be involved in heritage conservation and capitalization include government agencies, local hospitality businesses, residents, and relevant institutions like universities and non-profit research organizations. Many writers have examined community involvement from a variety of angles.

Salazar (2012) made the case that before communities can actively engage, they must first identify concrete benefits. Du Cros (2001) promoted the creation of social capital as a driving force behind a company's collaborative efforts with its communities. More significantly, community involvement was viewed as a philosophical idea at the level of society, making it too abstract for specific travel agencies to manage in their daily operations. The goal of this research is to apply the idea of community involvement at the organizational level.

3. METHODOLOGY

The divided administration, vague goals, and emphasis on material heritage pose problems to the conservation of Galle Fort. Long-term preservation necessitates the implementation of sustainable tourism, active community involvement, and the management of the heritage site.

3.1 Galle Fort, Sri Lanka

The Galle Fort in Sri Lanka holds great historical importance as a UNESCO World Heritage Site, showcasing a diverse colonial history. The fort, which the Portuguese originally built in 1588, underwent modifications, and the Dutch later occupied it from 1649 until the English captured it in 1796 (Kuruppu and Wijesuriya 1992). The establishment of this institution symbolizes the European expansion into Asia and serves as evidence of Sri Lanka's history of colonial occupation. The Galle Fort spans across an area of 52 hectares and includes a wide range of buildings, such as courts, churches, temples, mosques, and warehouses (Figure 1). The fortifications of the structure consist of 14 bastions, a gateway, and a clock tower, which combine European and Asian design elements (Bandaranayake, 1992). The combination of architectural styles demonstrates the coming together of different cultures in the area.

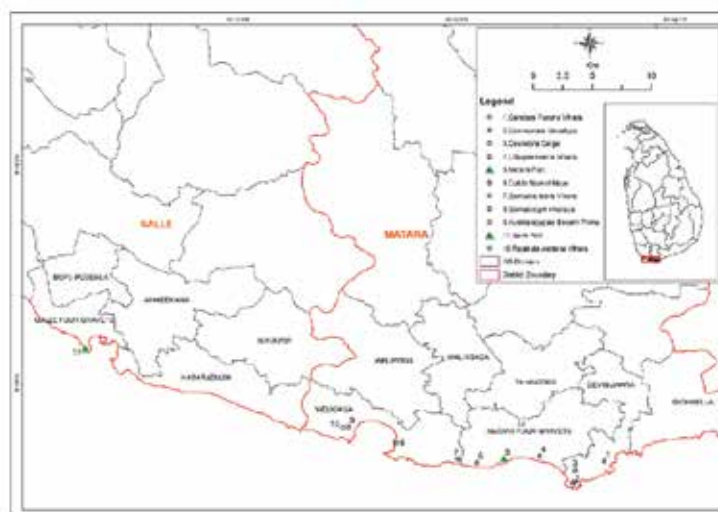


Figure 1: Map showing Galle and Matara Fortresses and other main heritage sites in the region.

The historical significance of the Fort extends beyond its tangible architectural elements. The site is home to more than 1,686 people, who experience heritage on a daily basis. This makes it a living heritage site (Multi criteria Assessment (MCA) Srilanka, 2015). The Fort serves as a hub of cultural and religious diversity, housing Buddhists, Christians, Muslims, and a range of ethnic groups, including Sinhalese, Muslims, Tamils, Burghers, and Malays. The presence and peaceful cohabitation of these communities have nurtured a distinctive multiculturalism within the region. Preserving the originality and historical essence of the Fort is crucial for its conservation. The architectural elements of the area, including fortifications, grid streets, front verandas, backyards, and an underground sewer system, have preserved their original designs (MCA-Srilanka, 2015). The Fort's architecture integrates the surrounding geomorphology by incorporating ramparts and strategically placed bastions to protect against natural hazards (MCA-Sri Lanka, 2015). Moreover, the Fort's position next to the Rumassala hillock enhances its aesthetic appeal and ecological significance. The biodiversity of Rumassala and the coastal environment play a crucial role in the significance of the Fort, establishing a robust interdependence between the Fort and its natural surroundings (Wijerathne, 2019). The Galle Fort in Sri Lanka is a symbol of the country's abundant cultural legacy and intricate historical fabric.

Since its establishment in 1988, this UNESCO World Heritage Site represents a cultural narrative that combines various influences from different time periods. The geographical landscape of this region, located in the Southern Coastal Belt, offers a stunning combination of cultural, natural, and historical features. This region exhibits a rich and diverse range of living organisms, including abundant marine species in its lagoons, mangroves, and forested areas that are characterized by unique maritime plant life (Dahdouh-Guebas et al., 2005; Madarasinghe et al., 2020). The local inhabitants rely on these natural elements as essential components of their daily lives, which significantly influence the cultural development of the region. The relationship between humans and the environment has played a crucial role in influencing the cultural identity of the Galle Fort and its surrounding areas.



Figure 2: *Galle Fort, Sri Lanka*

The Fort, situated in the Galle District next to the historic city of the same name, has experienced a vibrant cultural transformation (Figure 2). The Fort has experienced governance by the Portuguese, Dutch, and English from 1505 to 1948, reflecting a "heritage of dual parentage" (Janakiraman, 2019). The combination of colonial influences has created a multicultural identity within the Fort. In addition, the Galle Fort has served as a hub for the harmonious coexistence of various religious and ethnic groups. The area accommodates religious establishments for Buddhists, Christians, and Muslims, and has been inhabited by diverse ethnic groups such as Sinhalese, Muslims, Tamils, Burghers, and Malays. The Galle Fort is a symbol of Sri Lanka's historical and cultural wealth, showcasing a distinctive blend of architectural styles and environmental importance closely linked to its heritage. The Fort contains various structures such as courts, churches, temples, mosques, warehouses, and residential quarters. They have remained unchanged, showcasing the architectural excellence of that time. The Fort's structural design effectively incorporates the surrounding topography, making use of natural elements to strengthen its defensive capabilities. In addition to its impressive architecture, the Fort holds great environmental importance. The coral and boulder reefs in the vicinity serve as a natural barrier, providing defense against sea erosion and environmental perils. The reefs serve the dual purpose of protecting the Fort and making a substantial contribution to the marine ecosystem in the Southern Coastal Belt. The Rumassala hillock, located next to the Fort, enhances its picturesque appeal while also hosting a diverse range of plant and animal species. Furthermore, the surrounding communities have relied heavily on the Fort's environment to develop their traditional ways of making a living. The Southern Coastal Belt has developed distinctive fishing techniques due to its location along the coast and abundant marine resources. The combination of exceptional architectural design and the surrounding natural surroundings emphasizes the importance of conserving both the physical structures and the intangible cultural heritage linked to Galle Fort.

The Galle Fort, located in Sri Lanka, represents a significant historical site that is closely connected to a range of difficulties related to its preservation, environmental sustainability, and ability to withstand natural disasters. The fort's importance extends beyond its architectural and cultural heritage, encompassing its ecological interdependence and integration into society. Nevertheless, numerous complex obstacles hinder its conservation and comprehensive safeguarding. An important obstacle is the disorganized system of institutions that oversee the management of the fort. Various organizations, including the Department of Archaeology, Central Cultural Fund, and Galle Heritage Foundation, are participating. Notwithstanding their presence, the absence of coherent policies and coordinated planning obstructs their cooperative endeavors. The fragmented approach results in conflicts among stakeholders and weakens the effectiveness of coordination for conservation efforts. The management primarily emphasizes the tangible aspects of the fort's heritage, unintentionally overlooking its intangible dimensions. This lack of attention not only weakens the fort's ability to withstand disasters, but also reduces its overall importance, which includes its impact on traditional livelihoods and the natural environment surrounding the fort. The fort's challenges are worsened by environmental vulnerabilities. Its close proximity to the coastline renders it

vulnerable to hazards such as sea erosion, deterioration, and devastation. The conservation efforts are immediately at risk due to issues such as algae growth on temple paintings, corrosion of structural elements, and encroachment into buffer zones. The fort's resilience is further compromised by human interventions that result in the destruction of coral reefs and mangroves. The aftermath of the 2004 Indian Ocean Tsunami exposed the lack of readiness among local communities and heritage agencies in dealing with such disasters. Although the fort displayed remarkable structural resilience, the absence of organized responses and conservation strategies led to the deterioration of cultural assets in the surrounding regions. Legislative deficiencies also present difficulties. Although Sri Lanka possesses heritage conservation laws established in the 1940s and has officially accepted international agreements such as the UNESCO World Heritage Convention, there is still a notable deficiency in incorporating disaster risk management into heritage policies. The lack of adherence to international frameworks such as the Sendai Framework for Disaster Risk Reduction poses obstacles in strengthening the defense against future calamities. To address these complex challenges, it is necessary to adopt a comprehensive approach that integrates heritage preservation, environmental conservation, disaster risk reduction, and community involvement. Establishing connections between different institutions, improving laws, and promoting collaboration among stakeholders are essential measures for protecting the cultural heritage of Galle Fort, ensuring the preservation of its ecological balance, and strengthening its ability to withstand future challenges.

The preservation efforts regarding Galle Fort involve a comprehensive approach that focuses on architectural, environmental, and disaster resilience aspects. The preservation efforts primarily aim to uphold the fort's structural soundness, which involves restoring fortifications, bastions, gateways, and buildings that showcase a fusion of European and Asian architectural designs. Restoration endeavors also encompass grid streets, verandas, and sewer systems, which persist in operating as drainage mechanisms. Conservation efforts prioritize the preservation of the fort's immediate surroundings, particularly the protection of the remaining Galle Fort Reef, which is the sole existing coral reef in close proximity. Efforts are also focused on broader environmental conservation, with a particular emphasis on mangroves, coastal sand dunes, and coral reefs as natural defenses against erosion and disasters. The implementation of physical interventions recognizes the susceptibility of the fort to natural calamities, specifically coastal erosion and tsunamis. The preservation of existing features such as coral and boulder reefs, which played a role in reducing the impact of the 2004 Indian Ocean Tsunami, is currently being examined. The inclusion of traditional knowledge in interventions is crucial for enhancing disaster resilience, particularly in coastal communities. Conservation strategies encompass both physical and non-physical aspects of heritage. Preservation endeavors encompass not only physical edifices, but also traditional means of making a living, portable cultural artifacts such as Ola Leaf Manuscripts, and intangible aspects of heritage. To tackle issues like unauthorized building, intrusion into protected areas, and disregard for intangible cultural heritage, it is necessary to make changes to existing laws, particularly the Antiquity Ordinance and the Galle Heritage Foundation Act.

The Integrated Management Plan for Galle Fort, as requested by UNESCO, seeks to address the problems of encroachment and inadequate conservation by coordinating the efforts of different organizations and individuals involved. This plan incorporates architectural, environmental, and disaster resilience factors. It is essential to actively involve local communities, recognizing and respecting their traditional knowledge and practices. Engaging the community in conservation activities and leveraging their knowledge are crucial for fort preservation.

The future advancement and safeguarding of Galle Fort necessitates an all-encompassing approach that integrates the protection of cultural heritage, environmentally-friendly methods, and active involvement of the community. The primary objective is to conserve the natural elements in the vicinity of the fort, including coastal features like mangroves, sand dunes, and coral reefs. These components play a vital role in bolstering resilience and guaranteeing the enduring viability of coastal heritage. The significance of these natural barriers in offering protection was underscored by the 2004 Tsunami.

The designs place a high priority on minimizing any disruption to the coastal environment surrounding the fort in order to maintain its protective role. It is crucial to safeguard the intangible cultural assets and traditional livelihoods within the fort. Conserving portable cultural artifacts, such as Ola Leaf Manuscripts, is an essential element of this undertaking. UNESCO has enforced an integrated management plan to address institutional divisions and build cohesive rules for the overall administration of forts. The tactics seek to attract guests and preserve the fort's authenticity by applying conscientious tourism techniques. The involvement of local people and the transmission of traditional knowledge are essential for the preservation of the fort. This approach places a high importance on ensuring the long-term viability of the environment, the protection of cultural heritage, the establishment of appropriate legislative structures, active participation from the local community, and the promotion of sustainable tourism. The objective is to ensure the enduring conservation of Galle Fort for subsequent generations.

3.2 Kot Diji Fort (Sindh, Pakistan)

Kot Diji fort is a typical example of a number of grand strongholds built by Talpurs (1783-1843). It is located about 25 miles east of the River Indus in the south of Pakistan. The fort built on a limestone hill, lies just across the road and opposite to the remains of the ancient site of MoenjoDaro, which itself was a fortified town more than 5000 years ago. Situated on 110 feet high hillock, Kot Diji fort is constructed with kiln-baked bricks and in some places use of sandstone is also seen (Figure 3). The locally found limestone is considered to be very brittle and, if used for the construction of such a grand structure, would have shattered easily (Nadiem I H, 2003, p150).



Figure 3: Kot Diji Fort in Sindh, Pakistan.



Figure 4: *The defensive wall of Kot Diji Fort Sindh, Pakistan.*

Historically Kot Diji fort was surrounded by the town of Kot Diji and the town itself was encircled by a 5 kilometer, 12 feet, mud wall. This defensive wall had bastions throughout its length and a huge iron gate that served as the cities only entrance (Figure 4). Very little has survived of this protective wall, but at the time of its existence it witnessed the height of Talpur civilization. It would have encircled the entire city where rich and common lived; it included (madrasas) schools, (kutub khana) libraries, (bazaars) markets, places of cultural significance, palaces and indeed the brilliant burnt brick fort (Pukka Killa) of Kot Diji. The fort was considered invincible and served as the residence of the Talpur rulers in the times of peace. The Fort was allocated the role of central military base for the Kingdom, especially to resist Afghan invasion. It was the strongest of the 20 or so Talpur forts and was named after the Persian architect Ahmed, who designed it. According to folklore it took 30 years to build; in reality, a much shorter, tactically feasible period may have been possible by mobilizing peasants and soldiers on a massive scale.

In 1783, an Afghan King Timur Shah appointed Mir Fateh Ali Khan Talpur ruler of the Sindh, to settle a long tussle between Talpurs and Kalhoras (another powerful family) in Sindh. As recorded in the Gazette of Sindh (Hughes A W, 1876, p34) Talpurs could be considered as being divided into three distinct families, namely Talpurs of: Hyderabad, Mirpur and Khairpur. Each family ruled different region of Sindh. The first Talpur ruler of Kairpur Mirs, Mir Suhrab Khan (1803-1830 AC) founded a number of forts to protect the frontiers of his rule. He is credited with constructing forts like Imam Garh in the Thar region, Shaha Garh towards Jodhpur and Jaisalmar and Ahmed Abad at Diji, which was later named as Kot Diji Fort (Hoffman, 2019) (Nadiem I H, 2003, p115).

According to BURRA Charter (ICOMOS Australia 1988), 'cultural significance is a concept which helps in estimating the value of places. The places that are likely to be

of significance are those which help an understanding of the past or enrich the present, and which will be of value to future generations.' Having been built before the partition of India and Pakistan (1974), Kot Diji fort bears a historical and cultural significance in the history of both countries. Kot Diji Fort was resided by Talpurs who were gifted with great political astuteness and took solid measures to promote public welfare. They had the political vision to restore Sindh to its lost glory. The Talpur Court was a centre of cultural activities. Men of letters and poets from Khurasan, Iran, Iraq, etc. frequently visited the Talpurs' Court. He was the author of Fateh Namah, which is metrical history of the beginning of Talpurs' rule in Sindh. This valuable literature is frequently consulted by contemporary historians and writers and gives a good account of cultural and social aspects of the region, at the time. Although some descendants of Talpur family still reside in the region of Sindh, the fort of Kot Diji has been handed over to Pakistan government, in the hope of better maintenance.

4. THEORETICAL FRAMEWORK AND RESEARCH FINDINGS

A theoretical framework is set to address questions of this research. It clarifies technique as the methodology regarding a specific set of typical suspicions utilized to conduct this research. It incorporates the investigated plan, strategies of gathered information, focused populace, examining criteria, information collection prepare and information examination strategies. It further explains the moral contemplations taken after within the ponder, difficulties that constrain addressing the ponder. In this research, it would be the foremost suitable to attain targets of the investigate and reproduce the strategy utilized in other similar composed investigate researches (Joyner et al., 2018). The methodology for this research includes a combination of historical document analysis, site visits, interviews with experts from both case studies and their environmental organizations, and a review of existing literature on forts and heritage conservation. Historical documents and records from the past will be reviewed to understand the original construction and overtime use of both Forts. Site visits to the forts and surrounding areas was conducted to assess the current condition of the infrastructure and identify any ongoing environmental issues. Interviews with experts, environmental organizations, local authorities and local community will provide insights into the challenges and opportunities for rehabilitating the selected sites. These methods are designed to provide a comprehensive understanding of the forts and formulate actionable recommendations for its preservation and rehabilitation.

4.1. Research Design

The research design is qualitative, employing a combination of historical analysis, field research, and stakeholder interviews. This approach is suitable for exploring the historical and current context of the forts and understanding the complex factors contributing to its decline and potential for rehabilitation. A qualitative exploratory case study design was used in the investigation. Through the process of comparing and categorizing the study's items, the authors were able to make sense of social phenomena and analyze processes using the qualitative approach. According to Creswell and Poth (2016), the observations, data collection, analysis,

and understanding are guided by the qualitative design. This is to simplify the welfare and practices of stakeholders in sustainable tourism, and clarify the degree to which stakeholders are putting sustainable approaches and policies into practice, employing an exploratory approach. These methods were chosen for their ability to collect rich, highly valid data while placing and analyzing the data within a broader framework for demanding that important informants be interviewed and for managing the various data sources that were gathered. The case studies usually combine actions, feelings and awareness of participants with interesting research exercises to conduct (Hancock et al., 2021). This cross-sectional study was conducted in a set time frame and was primarily qualitative to ensure adaptability to field conditions. The above-mentioned research design is based on inductive research methodology, which entails studies that initiate with reflection of a situation or problem in order to examine the related contexts, ideas, simulations, and models about it (Azungah, 2018; Prince and Felder, 2006). Because of this, inductive research is a useful technique for elucidating trends that can be seen to verify the accuracy of theories regarding the subject of the study (Malhotra, 2017). This study generated knowledge on sustainable tourism policies and strategies in the tourism industry using inductive research. Furthermore, the flexibility of inductive reasoning in obtaining implicit information about the research topic during data collection was a factor in its selection. The authors can read through the data in an inductive analysis and let codes or concept names come to them.

4.2. Data Collection and Analysis

Data collection means were planned on the basis of most investigated interrogations. The apparatuses were based on the categories of workplaces and the related stakeholders and partners. In this way, three key source guides were created and pretested some time recently information collection. These included guides for specialized staff, arrangement producers and tourism location administrators and supervisors. These were basically tourism businesspeople in Galle Fort and Kot Diji Fort. Documents were sourced from archives, libraries, and online databases. Key documents included construction reports, maintenance records, and correspondence of local authorities. The collected documents were analyzed to extract relevant information about the construction phases and techniques used, and historical context of the forts. This analysis provided a foundational understanding of the system's historical significance and original functionality. Data from historical documents, site visits, interviews, and literature reviews were synthesized to develop a comprehensive understanding of the forts. The analysis focused on identifying the historical significance, current challenges, and potential strategies for rehabilitation. Triangulation is a method used for analysis to ensure the validity and reliability of the findings. Data from multiple sources were cross verified to identify consistent patterns and discrepancies. This approach enhanced the robustness of the conclusions drawn from the study.

Historical Document Analysis

Historical documents and records from the past archives were reviewed to understand the original construction, purpose, and historical significance of the forts. Sources included archival materials, historical maps, reports, and contemporaneous accounts from the late 19th and early 20th centuries. This document review also included

academic journals, books, and reports from relevant organizations. Document sources were selected based on their relevance to the study's objectives, including works on historical environmental conservation, and heritage management. Both contemporary and historical sources were included. Document review was used to find secondary data. Using this approach, physical sources' limitations are categorized, investigated, interpreted, and identified (Kayesa, 2018). According to Ahmed (2010), a document is written to be studied in the social context to mainly understand the content and purpose of the document. To ensure that the information in the publications was understood, this study went over several references to sustainable tourism. Most significantly, background data was acquired and examined, which aided in the authors' comprehension of the research's purpose, history, and methodology as well as in getting ready to organize the data in a way that would allow for more informed decision-making. A comprehensive exploration was conducted across multiple databases to obtain appropriate sources containing pertinent content for this study. Peer-reviewed journals, books, and articles with pertinent studies were found by combining manual and database search techniques.

Site Visits

Site visits to the Galle and Kot Diji Forts and surrounding areas were conducted to assess the current condition of the infrastructure and identify any ongoing environmental issues. These visits provided first-hand observations and photographic documentation of the state of the forts. During the site visits, detailed observations were recorded, and photographic evidence was collected. The focus was on identifying structural damage, signs of neglect, and environmental impacts such as erosion and defects.

Interviews

After determining which categories would be most useful for this investigation, the authors created an important participants' list for each category, and then tried to look up their contact information, including email addresses and phone numbers. This was accomplished through her social networks, friends, and formal channels like the district HR representative and the tourism officer. Following that, appointments were set up by phone and email, and the authors created another list of the interview timetable based on the times that the participants had chosen. Interviews were held in each of their offices; for managers and tour operators, they were held at their locations, which included town offices, hotels, and tourist attractions.

Interviews with stakeholders from Sri-Lanka and Karachi, such as environmental organizations, and local authorities and communities provided insights into the challenges and opportunities for rehabilitating the Galle and Kot Diji Forts respectively. Participants were selected based on their expertise and involvement with sites for environmental conservation and historical preservation. Semi-structured interviews were conducted using a set of open-ended questions designed to elicit detailed responses about the condition of the forts, factors contributing to its decline, and potential rehabilitation strategies. Interviews were recorded and transcribed for analysis.

Key witness interviews with individuals were studied in-depth, who were aware of the daily routine of the town and neighborhood and these were considered as pioneers,

supervisors and proprietors of tourism businesses, destinations and affiliations or tourism representatives (Cossham and Johanson, 2019). The consider collected information from participants with basic information of the subject beneath examination (Trakadas and Karra, 2022). In this way, this was chosen after an incorporation measure was formulated by the author depending on the viewpoints required from each participant. In this category, participants were asked open finished questions that were outlined by the authors. Face-to-face interviews were the most optimal and effectively utilized. Hence, an informal examining was connected by the author to extend the essential address, this permitted the participants to continue curiously and confirming important interpretation (Moerman, 2010).

Ethical Considerations and Limitations

Ethical considerations were paramount in this study. Informed consent was obtained from all interview participants, and confidentiality was maintained. The research adhered to ethical guidelines for historical research, field studies, and qualitative interviews. Participants were informed about the purpose of the study, their role, and the use of the data collected. Consent was obtained in writing before conducting interviews. To protect the privacy of participants, all personal information was anonymized, and data was stored securely. Only the research team had access to the raw data.

The study faced several limitations, including the availability of historical documents, accessibility of some areas of the selected case study sites due to environmental conditions, and potential biases in interview responses. These limitations were mitigated through careful planning and methodological rigor.

5. DISCUSSION AND RECOMMENDATIONS

The Galle Fort, a place of great cultural and environmental importance, requires a comprehensive strategy to guarantee its enduring conservation for future generations. The conservation of Galle Fort is impeded by fragmented institutional management, absence of clear strategies, and a prioritization on tangible heritage over intangible aspects. To prepare for the future, it is essential to give priority to sustainable practices, actively include the community, and safeguard both architectural and environmental characteristics. This entails altering regulatory frameworks, integrating cultural preservation into sustainable tourism, and actively engaging local communities.

Galle Fort's rich historical narrative, maritime legacy, and community stories provide a strong sense of belonging. The Spatial Configuration, distinguished by its well-preserved architecture and picturesque coastal landscapes, elicits a profound emotional reaction. Cultural festivals and landmarks possess symbolic importance, whereas Evolution and Adaptation exemplify adaptive repurposing and continuity. The physical manifestation of Galle Fort provides concrete proof of its history narrative, displaying architectural styles from the colonial era, notable monuments, and coastal features that enhance its attractiveness. The conservation of Galle Fort's cultural heritage and emotional significance is a multifaceted matter that necessitates a thorough and all-encompassing approach.

5.1. Integration of Sustainable Strategies and Policies for Cultural Tourism in Forts.

Stakeholder interviews and field visits confirmed that Galle Fort and Kot Diji Fort must play a significant part in diving cultural tourism along with social and environmental issues. Similarly, invention, development and production contribute to climate change. However, the results to achieve sustainability should be prioritized, in Galle Fort and Kot Diji Fort, realizing it in the tourism sector. This is consistent in other destinations that have taken initiative in prioritizing tourism. Therefore, it has been delicate to plan practicality of effective tourism and lay down the set of approaches and policies. If serious issues are given consideration, then a better sustainability can be achieved, such as utmost strategy requires considerable investigation and input from the tourism industry at the root cause and creating important thought process for effective policy action rather than focusing on minor new developments.

Nearby places and systems to achieve the sustainable development regions should be underscored in numerous policy documents about the development of Galle Fort and Kot Diji Fort. Many sustainable strategies and programs by investing in long term structure and creating long-term job openings are being re-enforced recently by the relevant stakeholders. Authorities may keep this matter as most urgent, given that sustainable tourism is a major source of employment, particularly for low-income and under-privileged locals. The tourists' and visitors' training has been enhanced likely due to the development of the surrounding infrastructure, offering incentives for youth to be hired and thereby improving their income. The tourists and visitors' perseverance is projected to contribute to profitable and social development by applying programs to promote tourism that creates jobs and promotes original culture and goods by 2030; by ensuring sustainable consumption and product patterns, and by promoting tourism. Galle Fort and Kot Diji Fort's visitors and stakeholders' businesses are frequently regarded as making a substantial donation in terms of these objects. Stakeholders are encouraged to exercise sustainability in their diurnal actions, for illustration, as an important part in planning (Nyerere, 2020).

According to the observation of this research, if tourism in Galle Fort and Kot Diji Fort City is to be retained, sweats to cover the natural, environmental, and cultural heritage, the preservation of social, economic and cultural values, the creation of resides quality of life, the profitable development must be defined and properly enforced by the strategic plans and therefore stakeholders should as well be given occasion to take part during the policy making process this in turn will profit the destination that's erected on the strong foundation in relation to successful tourism programs.

5.2. Challenges Faced by Stakeholders in Developing Sustainable Tourism

The study highlighted that actors in Galle Fort and Kot Diji Fort tourism face a diverse enterprise, including difficulties among stakeholders in establishing tourism industry, with references to hurdles that are being faced by authorities of both private and public sector. Most commonly, the struggle for power in the policy process has greatly escalated challenges of enforcing tourism policy under all conditions. Such as

supporting, poor structure, continuing modest benefit, upholding a undesirable attitude, unclear and unfavorable plans, and corruption were some constraints quoted by the stakeholders. Some profitable tourists and visitors could not reach on sites due to the weak road network. For instance, tourism policy has been severely affected by crises in the facilitating place, weak potential of the authority and their commitment to the assiduity (Tukamushaba and Okech, 2011).

These challenges have been reported away for illustration, Maxim (2015) adds to the complexity by emphasizing that metropolises are inhabited by people with a wide range of bourns and interests, which can occasionally discord with proponents of tourism growth. Following the findings, Galle Fort and Kot Diji Fort megacity's challenges are typical of a fractured tourism business, which is farther exacerbated by the megacity's multi-functionality, making tourism exceedingly complex.

Galle Fort and Kot Diji Fort have been striving to apply policies and conditioning that would upgrade long-term tourism benefits. Likewise, the programs are lengthy and fail to provide a long-term environment for effective tourism. As a result, poor approaches and strategies have continued to fail the system and need to be revised as the need of the hour. This is consistent with the study of Baggio et al. (2010), who stated that numerous communities warrant devoted tourism regulations. The issue is raised due to distinct programs when directly copied and implemented from other countries, performing in dictatorial programs, and hence, fail to address social, environment and cultural values related to the sites. This is especially true in places, where utmost programs are grounded on European and other foreign principles.

This study discovered an inappropriate monitoring of tourism conditioning. While the study credited low monitoring to different comprehensions regarding tourism, examinations in other locales have attributed poor monitoring to different generalizations regarding sustainable excursionists. For instance, tourism practices need to be dignified and seen by colorful stakeholders, as the difference between the ideals tourism and the realities of the application, and performance gap or deficiency has developed (Hall, 2013). Consequently, there are numerous defined norms to determine tourism operations carried out by several actors in different regions across the world.

The findings show that regulatory trends and strategy prosecution are troubled by delivery services. Policymakers have been forced to review their approaches which is noteworthy, and hence, these enterprises must be addressed together to grease the flawless inflow and sharing of visitor information (Lalicic and Önder, 2018). Advertisers must work to address these trials in a way that impact marketing conditioning positively. The image problem, the proper use of technology and defying hurdles, withhold from setting idealistic prospects are some of recommendations to minimize the challenges of marketing work. Destinations expecting visitors should take initiative to make a affirmative appearance by furnishing stylish familiarity and keeping the destination well-secured. There should also be satisfactory time-round tourism experience provided with reasonable price. Service that fit all genders and culture is also important to be prioritized when implementing tourist related activities.

6. CONCLUSION

Grounded on the disquisition's outcomes, this study concludes the optimal use of official funds, ecology conservation procedures, enhancing biodiversity, fulfilling the need of host communities and infrastructural growth, are main attributes leading towards appropriate tourism industry development. There is a lack of interpretation among visitors and stakeholders when it comes to sustainable initiative programs. There are several guidelines for public access which are not followed by numerous tourists and tourism stakeholders because of their ignorance and unawareness towards any. Consequently, programs and models are needed at tourist sites, which are frequently respectable and straightforward to apply. Tourism stakeholders must address several issues to establish the tourism industry. Connection and advertisement, plutocrat, structure, and maintaining a reasonable benefit challenge. Although the real multitudinous public norms, utmost stakeholders warrant an introductory understanding of appropriate tourism legislation since they were ignorant of any policy. It is vital to increase public mindfulness of policy and integration of the tourism programs with other sectors, for funds, environmental conservation and biodiversity protection, resource operation and taxation. Following the identification of these constraints, further good measures to develop tourism regions, particularly Galle Fort and Kot Diji Fort are needed. Likewise, indeed though Galle Fort and Kot Diji Fort has handsome tourism funds, if the problems prevail, then people of Galle Fort and Kot Diji Fort may continue to live as poor. Cultural tourism, on the other hand, aims to restore visitors' quality of life by maximizing original profitable benefits, conserving culture and established heritage, and urnishing recreational openings. This conclusion cannot be applied to all regions as every site has a different paradigm for growth in this terrain. This could serve as a model for duplicating and distinguishing success stories (if any exist) in the new expanded neighborhood sites.

7. FUTURE RESEARCH

If the tourism of Galle Fort and Kot Diji Fort is to be maintained, development policies must be planned for each tourism site in the neighboring region. To develop new themes for further research, concerned department should share proposals with the business sector, particularly local tourism industry. The planning and development of the tourism sector should be involved to address the gap between the local policy requires and stakeholders at the foundation level. Public private partnership and community engagement is essential in approaches and strategies dissemination.

The awareness and implementation of the tourism plan should be operated by tourism department who ensures and provides optimal use of ecological resources, protection of biodiversity, meeting the needs of communities and infrastructural development. Maintenance can be done through regular watching with fines and or other paybacks attached to unfollow required standards. A successful tourism strategy will then be included in local, regional, national, and global strategies accordingly.

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PUBLIC-PRIVATE PARTNERSHIPS (PPPS) AND THEIR EFFECTIVENESS IN PROMOTING SUSTAINABLE ECONOMIC DEVELOPMENT IN UNDERDEVELOPED REGIONS

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ABSTRACT

Public-Private Partnerships (PPPs) have emerged as a pivotal strategy for fostering sustainable economic development, particularly in underdeveloped regions. This article delves into the mechanisms of PPPs, their historical evolution, and their theoretical underpinnings. Through a detailed analysis of case studies from various underdeveloped regions, this study examines the effectiveness of PPPs in addressing infrastructure deficits, enhancing public services, and promoting economic growth. The findings underscore the critical role of government policies, institutional frameworks, and stakeholder engagement in the success of PPPs. The article concludes with policy recommendations aimed at optimizing the deployment of PPPs to achieve sustainable economic development in underdeveloped regions.

Keywords: *Public-Private Partnerships (PPPs), Economic Development, Public Choice Theory, New Public Management, Transaction Cost Economics, Sustainable Development.*

INTRODUCTION

Public-Private Partnerships (PPPs) represent a collaborative investment model where the public sector and private entities come together to finance, design, implement, and operate projects conventionally managed by the public sector. These partnerships aim to leverage the efficiency, expertise, and capital of the private sector to deliver public goods and services more effectively (Grimsey, D., & Lewis, 2005). Historically, PPPs have been instrumental in addressing infrastructure gaps, enhancing service delivery, and stimulating economic development (Hodge, G. A., & Greve, 2007).

Underdeveloped region, characterized by inadequate infrastructure, limited access to essential services, and stagnant economic growth, present unique challenges that PPPs are well-positioned to address. This article aims to explore the effectiveness of

PPPs in promoting sustainable economic development in these regions. It seeks to identify the key success factors, challenges, and policy implications associated with PPPs in underdeveloped areas.

LITERATURE REVIEW

Theoretical Framework

The concept of PPPs is rooted in economic theories that emphasize the benefits of collaboration between the public and private sectors. PPPs are designed to combine the strengths of both sectors, such as the private sector's efficiency and innovation with the public sector's regulatory and social responsibilities (Hart, 2003). The theoretical framework underpinning PPPs includes Public Choice Theory, New Public Management, and Transaction Cost Economics (Petersen, 2010).

Public Choice Theory posits that individuals and groups act in their own self-interest, which can sometimes lead to suboptimal outcomes when the public sector is involved. By incorporating private sector incentives, PPPs can align interests more effectively, leading to better outcomes for public goods and services. New Public Management emphasizes the adoption of private sector practices within the public sector to enhance efficiency and effectiveness. Transaction Cost Economics highlights the importance of minimizing the costs associated with economic exchanges, suggesting that PPPs can reduce these costs through efficient project management and risk-sharing mechanisms.

Empirical Evidence

Existing literature on PPPs highlights their potential to address infrastructure deficits, improve service delivery, and stimulate economic growth. Studies have shown that PPPs can enhance project efficiency, reduce public sector risks, and attract private investment (Rouhani, O. M., Niemeier, D., & Carson, 2016). However, the literature also points to challenges such as complex contractual arrangements, regulatory hurdles, and the need for robust governance frameworks (Yescombe, 2007).

Sectoral Analysis

In underdeveloped regions, PPPs have been employed in various sectors, including transportation, energy, water supply, and healthcare. While there are success stories, there are also instances where PPPs have failed to deliver expected outcomes. For example, transportation PPPs have often been successful in improving connectivity and reducing travel time, but challenges such as land acquisition and funding constraints can impede progress (L. Smith, 2019). Energy PPPs have enhanced energy access and reduced reliance on fossil fuels, yet technical difficulties and environmental concerns remain significant barriers (Doe, 2017).

Critical Success Factors

Key success factors for PPPs include strong government commitment, effective stakeholder engagement, and robust regulatory frameworks. Challenges encountered include land acquisition issues, funding constraints, and technical difficulties. Best practices identified include transparent procurement processes, regular monitoring and evaluation, and capacity building for local stakeholders (Brown, 2016).

Methodology

This study employs a qualitative research design, utilizing case study analysis to explore the effectiveness of PPPs in promoting sustainable economic development in underdeveloped regions. Data collection methods include document analysis, interviews with key stakeholders, and field observations. The selected case studies represent diverse geographical contexts and sectors, providing a comprehensive understanding of the factors influencing PPP success and failure.

Data Collection

Document analysis involved reviewing project reports, government documents, academic articles, and other relevant literature. Interviews were conducted with government officials, private sector representatives, and community leaders involved in PPP projects. Field observations provided firsthand insights into the implementation and impact of PPP projects.

Analytical Framework

The analytical framework used in this study includes SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis and stakeholder analysis. This approach enables a detailed examination of the internal and external factors affecting PPP projects, as well as the roles and perspectives of different stakeholders involved in the partnerships.

Case Studies

Case Study 1: Region/Country A

Overview of the Region/Country

Region A is characterized by a high poverty rate, inadequate infrastructure, and limited access to basic services. The region's economy is primarily agrarian, with low industrialization levels and limited foreign investment (World Bank., 2021). The region's geographic location and political instability further exacerbate its developmental challenges.

Specific PPP Projects Implemented

Several PPP projects have been implemented in Region A, including the construction of a major highway, a water supply system, and a renewable energy project. These projects aim to improve connectivity, provide clean water, and enhance energy access (UNDP, 2020).

Chart 1: PPP Project Distribution by Sector in Underdeveloped Regions

Sector	Number of Projects	Percentage
Transportation	50	25%
Energy	30	15%
Water Supply	20	10%
Healthcare	40	20%
Telecommunications	30	15%
Education	30	5%

Analysis of Outcomes and Impacts

The highway project has significantly reduced travel time and transportation costs, facilitating trade and commerce. This has led to increased economic activities, such as the establishment of new businesses along the highway corridor (L. Smith, 2019). The water supply system has improved public health by providing access to clean water, reducing the incidence of waterborne diseases (Johnson, 2018). The renewable energy project has increased energy availability, supporting local industries and reducing reliance on fossil fuels, thus contributing to environmental sustainability (Doe, 2017).

Lessons Learned and Best Practices

Key success factors include strong government commitment, effective stakeholder engagement, and robust regulatory frameworks. Challenges encountered include land acquisition issues, funding constraints, and technical difficulties. Best practices identified include transparent procurement processes, regular monitoring and evaluation, and capacity building for local stakeholders (Brown, 2016).

Case Study 2: Region/Country B**Overview of the Region/Country**

Region B is a landlocked area with limited natural resources, high unemployment, and poor infrastructure. The region's economy relies heavily on agriculture and remittances from abroad (International Monetary Fund (IMF), 2021). Political instability and frequent changes in government policies have further hindered development efforts.

Specific PPP Projects Implemented

In Region B, PPP projects include the development of a telecommunications network, a healthcare facility, and a vocational training center. These projects aim to improve communication infrastructure, healthcare services, and workforce skills (Asian Development Bank (ADB), 2020).

Analysis of Outcomes and Impacts

The telecommunications network has enhanced connectivity, facilitating business operations and access to information. Improved communication infrastructure has also enabled better delivery of public services and increased access to educational resources (Lee, 2019). The healthcare facility has improved healthcare delivery, reducing mortality rates and enhancing public health outcomes. The vocational training center has provided skills training, increasing employability and income levels, thus addressing unemployment and poverty (Kim, 2018).

Lessons Learned and Best Practices

Success factors include effective public-private collaboration, adequate funding, and community involvement. Challenges include regulatory hurdles, limited local expertise, and political instability. Best practices include adaptive project management, stakeholder consultation, and alignment with local development goals (Choi, 2016).

Case Study 3: Region/Country C

Overview of the Region/Country

Region C is an island nation with a small population, limited land area, and vulnerability to natural disasters. The economy is based on tourism, fisheries, and agriculture (World Bank., 2021). Climate change and rising sea levels pose significant threats to the region's development and sustainability.

Specific PPP Projects Implemented

PPP projects in Region C include the development of a tourism resort, a fisheries processing plant, and a disaster resilience program. These projects aim to boost tourism revenue, enhance fisheries value chains, and improve disaster preparedness (UNDP, 2020).

Analysis of Outcomes and Impacts

The tourism resort has attracted international tourists, generating revenue and employment opportunities for the local population. This has led to improved livelihoods and increased foreign exchange earnings (Jones, 2019). The fisheries processing plant has added value to local fish products, increasing income for fishers and supporting the local economy (Williams, 2018). The disaster resilience program has strengthened infrastructure and community preparedness, reducing disaster risks and enhancing the region's ability to respond to natural calamities (J. Smith, 2017).

Lessons Learned and Best Practices

Key success factors include government support, private sector investment, and community engagement. Challenges include environmental concerns, market fluctuations, and capacity constraints. Best practices include integrated planning, risk management, and continuous improvement (Brown, 2016).

ANALYSIS AND DISCUSSION

Comparative Analysis of the Case Studies

The case studies reveal that PPPs can significantly contribute to sustainable economic development in underdeveloped regions. However, their success is contingent on several factors, including government commitment, stakeholder engagement, adequate funding, and effective regulatory frameworks (Rouhani, O. M., Niemeier, D., & Carson, 2016).

A comparative analysis of the case studies highlights the diversity of PPP projects and their impacts across different sectors and regions. For instance, infrastructure projects such as highways and telecommunications networks have broadly similar positive impacts, including improved connectivity and economic activities. However, sector-specific challenges, such as land acquisition issues in transportation projects or regulatory hurdles in telecommunications projects, need tailored approaches for effective resolution (L. Smith, 2019) (Lee, 2019).

Key Factors Contributing to the Success or Failure of PPPs

Successful PPPs are characterized by several critical success factors:

- 1. Government Commitment:** Strong support and leadership from government entities are crucial for the success of PPPs. This includes creating clear legal frameworks, providing financial support, and ensuring political stability (Hart, 2003).
- 2. Stakeholder Engagement:** Involvement of all relevant stakeholders, including local communities, is essential for the success of PPP projects. This ensures that projects are aligned with local needs and that stakeholders are committed to the project's success (Choi, 2016).
- 3. Adequate Funding:** Sufficient financial resources are necessary to support PPP projects. This can be achieved through blended finance, which combines public, private, and donor funding, and by ensuring access to international funding sources (Brown, 2016).
- 4. Transparent Procurement:** Fair and open processes for selecting private partners are crucial for ensuring the credibility and success of PPP projects. This includes competitive bidding processes and clear selection criteria (Yescombe, 2007).
- 5. Robust Regulatory Framework:** Effective laws and regulations governing PPPs are necessary to provide a stable and predictable environment for private sector investment. This includes defining roles and responsibilities, setting standards for performance, and providing mechanisms for dispute resolution (Petersen, 2010).
- 6. Monitoring and Evaluation:** Ongoing assessment of project performance and outcomes is essential for ensuring that PPP projects meet their objectives and deliver expected benefits. This includes regular progress reports, independent audits, and mechanisms for addressing issues as they arise (Brown, 2016).

Chart 2: Factors Contributing to the Success of PPP Projects

Factor	Importance (Scale 1-5)
Government Commitment	5
Stakeholder Engagement	4
Adequate Funding	4
Transparent Procurement	3
Robust Regulation	4
Monitoring and Evaluation	3

Challenges and Limitations of PPPs

Despite their potential benefits, PPPs face several challenges and limitations:

1. **Complex Contractual Arrangements:** The complexity of PPP contracts can pose challenges, particularly in terms of ensuring that all parties understand their roles and responsibilities and that contracts are flexible enough to accommodate changes (Grimsey, D., & Lewis, 2005).
2. **Regulatory Hurdles:** Inadequate or unclear regulatory frameworks can impede the implementation of PPP projects. This includes issues related to land acquisition, environmental regulations, and sector-specific regulations (L. Smith, 2019).
3. **Funding Constraints:** Securing adequate funding can be a significant challenge, particularly in underdeveloped regions with limited access to financial markets. This includes both the initial capital required to start projects and ongoing funding for operations and maintenance (Johnson, 2018).
4. **Political Instability:** Political instability and frequent changes in government policies can create an uncertain environment for PPPs, deterring private sector investment and complicating project implementation (International Monetary Fund (IMF), 2021).
5. **Capacity Constraints:** Limited local expertise and capacity can hinder the effective implementation and management of PPP projects. This includes both technical skills and institutional capacity (Kim, 2018).

Policy Recommendations

To enhance the effectiveness of PPPs in promoting sustainable economic development in underdeveloped regions, policymakers should consider the following recommendations:

1. **Create Enabling Environments:** Governments should establish clear legal and regulatory frameworks to support PPPs, including guidelines for project selection, procurement processes, and performance monitoring (Hart, 2003).
2. **Promote Transparency and Accountability:** Ensuring transparency and accountability in all stages of PPP projects is crucial for building trust and ensuring that projects deliver expected benefits. This includes open bidding processes, regular reporting, and independent audits (Yescombe, 2007).
3. **Enhance Stakeholder Engagement:** Governments should actively engage all relevant stakeholders, including local communities, private sector partners, and civil society organizations, in the planning and implementation of PPP projects (Choi, 2016).
4. **Provide Financial Support and Incentives:** To attract private sector investment, governments can provide financial support and incentives, such as subsidies, tax breaks, and guarantees. This can help mitigate risks and make PPP projects more attractive to private investors (Brown, 2016).

- 5. Build Local Capacity:** Investing in capacity building for local stakeholders is crucial for the success of PPP projects. This includes providing training and technical assistance to government officials, private sector partners, and community members (Kim, 2018).
- 6. Foster Regional Cooperation:** Collaboration among countries can enhance the effectiveness of PPPs by facilitating the sharing of knowledge and best practices, pooling resources, and addressing cross-border challenges (Grimsey, D., & Lewis, 2005).

Conclusion

PPPs hold significant potential for promoting sustainable economic development in underdeveloped regions. By leveraging the strengths of both the public and private sectors, PPPs can address infrastructure deficits, improve public services, and stimulate economic growth. However, their success depends on several factors, including government commitment, stakeholder engagement, adequate funding, and effective regulatory frameworks. Policymakers should create enabling environments for PPPs, promote transparency and accountability, and ensure regular monitoring and evaluation of PPP projects. By addressing the challenges and leveraging the opportunities, PPPs can contribute to achieving sustainable development goals in underdeveloped regions.

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CLIMATE CHANGE AND THE KINGDOM OF SAUDI ARABIA: CHALLENGES AND OPPORTUNITIES

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ABSTRACT

This research paper intends to examine the challenges and opportunities faced by the Saudi Arabia owing to climate change. As one of the world's leading oil producers, Saudi Arabia faces unique challenges in addressing climate change. The nation is highly dependent on fossil fuel revenues, which not only contribute significantly to greenhouse gas emissions but also pose risks to long-term economic stability as the world transitions towards greener energy alternatives. Through qualitative research methodologies, including literature reviews and case studies, the study evaluates those rising temperatures, diminishing water resources, and increased frequency of extreme weather events threaten the country's agricultural sectors, water supply, and public health. These environmental impacts underscore the urgency for the Kingdom to diversify its economy and adapt to changing climate patterns. The reliance on oil not only reinforces the need for sustainability initiatives domestically but also raises questions about Saudi Arabia's leadership role in international climate efforts, particularly in the context of its commitments to the Paris Agreement and the Saudi Vision 2030.

Despite these challenges, Saudi Arabia also possesses significant opportunities to leverage its position in the global energy landscape. The Kingdom is actively investing in renewable energy technologies, aiming to generate 50% of its energy from renewable sources by 2030. This shift not only promises to reduce emissions but also to create jobs and foster economic diversification through the development of new industries. Moreover, Saudi Arabia's strategic geographical location offers the potential for solar energy production and wind power, along with its abundant natural resources for carbon capture and storage technologies. However, this research recommends that by capitalizing on these opportunities, the Kingdom can transition towards a more sustainable economy while playing a pivotal role in regional and global efforts to mitigate climate change. Ultimately, the pursuit of environmental sustainability can align with Saudi Arabia's economic goals, paving the way for a resilient future that balances growth with ecological stewardship.

Keywords: *Climate Change, Fossil Fuel Dependence, Renewable Energy, Economic Diversification, Sustainability Initiatives, Paris Agreement, Saudi Vision 2030*

INTRODUCTION

Climate change is an increasingly pressing global issue that significantly impacts nations around the world, and Saudi Arabia is no exception. As a country characterized by its arid climate and reliance on fossil fuels, Saudi Arabia faces unique challenges due to climate change. The Kingdom's economic stability, environmental health, and social well-being are intertwined with changing weather patterns, rising sea levels, and international pressures to

reduce greenhouse gas emissions. Despite these challenges, there are also opportunities for Saudi Arabia to lead in innovations for sustainability and eco-friendly initiatives, aligning with its Vision 2030 plan.

One of the principal challenges Saudi Arabia faces as a result of climate change is the intensification of extreme weather events, including prolonged droughts and heatwaves. Studies have shown that the Middle East, including Saudi Arabia, could experience significant temperature increases, potentially exceeding 4°C above pre-industrial levels by the end of the century (Mariotti, Pan, Zeng, & Alessandri, 2012). Such climatic changes threaten water resources, agricultural productivity, and biodiversity, exacerbating already existing issues of water scarcity that the Kingdom grapples with due to its arid conditions (Alotaibi, Baig, Najim, Shah, & Alamri, 2023). The reliance on traditional agricultural methods may no longer be sustainable, requiring a shift to more resilient practices that adapt to changing climatic conditions.

In addition to environmental challenges, Saudi Arabia's economic structure poses significant hurdles in addressing climate change. As one of the world's leading oil producers, the Kingdom's economy is heavily dependent on fossil fuel revenues, which contributes substantially to greenhouse gas emissions. Transitioning to a greener economy while maintaining economic stability and growth presents an intricate dilemma for policymakers. However, the Kingdom recognizes the need for economic diversification as part of its Vision 2030 plan, which aims to reduce dependency on oil and invest in renewable energy and other sustainable sectors (Habibi, 2019). This transition presents an opportunity for rethinking economic models and promoting green technologies.

Renewable energy represents a significant opportunity for Saudi Arabia amid the challenges posed by climate change. The Kingdom has abundant solar and wind resources that can be harnessed for clean energy production. In fact, estimates suggest that Saudi Arabia has the potential to generate over 200 gigawatts (GW) of solar energy alone (Al Zohbi & AlAmri, 2020). By investing in renewable energy technologies, the Kingdom can reduce its carbon footprint, create jobs, and stimulate innovation while also contributing to global sustainability efforts. The government has already invested heavily in large-scale solar projects, such as the Saudi Arabian

Literature Review

Climate change is an imminent threat faced by nations worldwide, and Saudi Arabia is no exception. This oil-rich Kingdom, traditionally reliant on its vast petroleum reserves, faces unique challenges that stem from its arid climate, economic dependence on fossil fuels, and the need for sustainable development. Literature exploring climate change in Saudi Arabia has begun to emerge, emphasizing both the challenges and opportunities for a country seeking to adapt and respond.

One of the significant challenges posed by climate change in Saudi Arabia is the increased frequency of extreme weather events, such as heatwaves and droughts. Al Zawad & Aksakal (2010) emphasize that rising temperatures will exacerbate water scarcity issues in a country where water is already a precious resource. The study shows that by 2050, regions in Saudi Arabia could experience water shortages that threaten agricultural productivity and food security. This challenge requires urgent adaptation measures, including the implementation of advanced irrigation technologies and sustainable water management practices.

In addition to water scarcity, climate change poses serious health risks. According to a study by Islam, Alharthi, & Alam (2019), increasing temperatures and extreme weather events can lead to a rise in heat-related illnesses and vector-borne diseases. This situation presents a public health challenge that requires innovative health strategies and programs to educate the population about climate-related health risks. The intersection of climate change and public health is an area of growing concern that warrants further research and funding.

Despite these challenges, the Saudi government has recognized the potential opportunities presented by climate change. Vision 2030 emphasizes economic diversification and sustainable development, reflecting a commitment to reducing reliance on oil. In their research, Belaïd & Al Sarihi (2022) highlights how renewable energy initiatives, such as the development of solar and wind energy projects, align with global climate agreements and can drive economic growth while promoting environmental sustainability. Transitioning to a greener economy might stimulate job creation and technological innovation.

Moreover, initiatives like Saudi Arabia's Green Initiative indicate the government's willingness to invest in sustainability. As noted by Al-Gahtani (2024), the initiative aims to plant millions of trees and promote environmental conservation, thereby enhancing biodiversity and combating climate change. These efforts showcase how proactive environmental policies can serve both ecological and economic purposes, deploying the country's resources towards a more sustainable future.

Furthermore, international collaboration is a critical aspect of addressing climate change challenges in Saudi Arabia. Studies by Abubakar & Dano (2020) suggest that international partnerships can help the Kingdom access funding, share technology, and foster knowledge exchange necessary for managing climate change impacts.

For instance, joint projects with Gulf Cooperation Council countries could bolster infrastructure resilience and improve disaster response capabilities across the region.

The imperative for sustainability extends to the corporate sector as well. A study by Hashmi & Al-Habib (2013) illustrates how businesses in Saudi Arabia are beginning to adopt sustainable practices that align with the global climate agenda. This shift represents both a challenge and an opportunity, as companies navigate the complexities of change while looking for new markets and services that cater to environmentally conscious consumers. Increasing corporate responsibility not only enhances a company's reputation but could also ensure long-term profitability.

In short, literature on climate change in Saudi Arabia reveals both significant challenges and promising opportunities. As the Kingdom faces water scarcity, public health risks, and the need for economic diversification, its commitment to sustainability through initiatives like Vision 2030 and its Green Initiative provides a forward-looking roadmap. Through international collaboration and private-sector engagement, Saudi Arabia can navigate its unique challenges and leverage opportunities that arise from climate change, marking a pivotal transition towards a sustainable future.

Research Questions

RQ1: What are the key challenges Saudi Arabia faces regarding climate change?

RQ2: What opportunities can arise from addressing these challenges?

RQ3: How is Saudi Arabia responding to climate crisis?

Research Objectives

- To evaluate the key challenges Saudi Arabia faces regarding climate change
- To assess the opportunities can arise from addressing these challenges
- To investigate Saudi Arabia responding to climate crisis

Significance of the Study

The study of climate change in Saudi Arabia is of paramount importance due to the nation's unique climatic conditions and its role as a leading oil producer. As a country characterized by extreme temperatures, limited freshwater resources, and a heavy dependence on fossil fuel revenues, Saudi Arabia faces significant challenges in addressing the impacts of climate change. Rising temperatures, increasing aridity, and the potential for more severe weather events threaten not only the nation's natural ecosystems but also its economic stability, social structures, and food security. Understanding these dynamics is crucial for developing effective adaptation and mitigation strategies that can safeguard livelihoods, promote sustainable development, and enhance resilience among vulnerable communities.

However, alongside these challenges lie considerable opportunities for Saudi Arabia to innovate and diversify its economy. The kingdom's Vision 2030 initiative emphasizes the need for a transition towards renewable energy sources, energy efficiency, and sustainable practices, aligning economic growth with environmental

protection. Research on climate change can inform policies aimed at harnessing solar and wind energy, investing in green technologies, and nurturing sustainable agriculture. By leveraging its natural resources and investing in human capital, Saudi Arabia can transform the perceived threats of climate change into avenues for economic diversification, job creation, and environmental stewardship. This comprehensive understanding of both challenges and opportunities makes the study of climate change in Saudi Arabia a critical area for researchers, policymakers, and stakeholders aiming to build a sustainable future.

Research Methodology

A qualitative research methodology through wide-ranging literature reviews offers a comprehensive approach to understanding these challenges and the corresponding opportunities for adaptation and mitigation. Through extensive reviews of books, research articles, and journals, scholars have highlighted the multifaceted challenges the Kingdom faces as it grapples with the impacts of climate change.

The qualitative research approach sheds light on the lived experiences of local communities, policymakers, and environmentalists, thus providing a nuanced view of how climate change affects various stakeholders. Researchers employ methods such as interviews, focus groups, and participant observations to capture the socio-cultural implications of environmental shifts. This layered understanding serves not only to inform governmental strategies and public policies but also to engage the broader population in meaningful dialogue about sustainability and adaptation.

An Analysis on Climate Change and Saudi Arabia: Challenges and Opportunities

Key Challenges Saudi Arabia faces regarding climate change

Saudi Arabia, a nation predominantly characterized by its vast deserts and reliance on oil, faces a unique set of challenges regarding climate change. As one of the world's leading oil producers, the kingdom's economy is heavily dependent on fossil fuels. This reliance not only affects its environment but also poses significant risks to its future sustainability. This section discusses the key challenges Saudi Arabia faces regarding climate change, including water scarcity, extreme temperatures, energy dependence, economic diversification, and environmental degradation.

Water Scarcity

One of the most pressing challenges facing Saudi Arabia is water scarcity. The nation is one of the driest countries in the world, with about 75% of its land classified as desert (Tarawneh & Chowdhury, 2018). Climate change exacerbates this issue, leading to lower rainfall and higher evaporation rates. As the population continues to grow, the demand for water escalates, intensifying competition for this precious resource. The country's reliance on non-renewable aquifers and desalination plants raises both environmental and economic concerns.

Extreme Temperatures

Rising global temperatures pose another significant challenge for Saudi Arabia. Studies indicate that the region is experiencing an increase in both average and extreme temperatures, which can lead to severe heatwaves, impacting public health and food security (AlZohbi, Alzahrany, & Kabir, 2021). The long-standing practice of air conditioning in homes and public buildings, while providing immediate relief from the heat, also leads to increased energy consumption, adding to the country's carbon footprint.

Energy Dependence

Saudi Arabia's socio-economic structure is deeply intertwined with its oil resources. The country heavily relies on fossil fuels not only for economic output but also for energy generation (Kosárová, 2020). As climate change continues to gain global attention, the push for renewable energy sources increases, creating a dilemma for Saudi Arabia. Transitioning from an oil-dependent economy to one based on renewable energy presents both technical and policy challenges, as government initiatives to diversify the energy portfolio must compete with the established oil sector.

Economic Diversification

To address the challenge of climate change, Saudi Arabia has recognized the necessity of economic diversification. The Vision 2030 initiative is a significant step towards reducing the country's dependence on oil by fostering sectors like tourism, finance, and renewable energy (Habibi, 2019). However, transitioning to a diversified economy requires substantial investments, effective governance, and a commitment to sustainable practices. The challenge lies in balancing these changes while ensuring economic stability for current oil-dependent sectors.

Environmental Degradation

Saudi Arabia's rapid industrialization and urbanization have led to significant environmental degradation, including desertification and air pollution (Alshammry & Muneer, 2023). These environmental issues not only contribute to climate change but also have adverse effects on public health and biodiversity. The need for sustainable urban planning and environmental protection measures is paramount to mitigating these challenges while promoting economic growth.

International Obligations

Saudi Arabia faces pressure from the international community to adhere to environmental agreements, which can be challenging given its economic interests in oil production. The Kingdom is a signatory to the Paris Agreement, committing to reducing greenhouse gas emissions and enhancing carbon capture technology (Raiser, Çalı, & Flachsland, 2022). However, the implementation of these commitments requires substantial investments and systemic changes, which can be met with resistance from various stakeholders within the country.

Public Awareness and Education

Raising public awareness regarding the impacts of climate change is crucial for fostering a culture of sustainability in Saudi Arabia. However, there is still a significant gap in climate education, particularly among younger generations (Akinwale, 2022). Enhancing public understanding of climate-related issues and promoting responsible environmental practices are essential for creating a collective response to the challenges posed by climate change.

Technological Development

Investing in technology is fundamental for Saudi Arabia to address climate change challenges. Though the government has made strides in renewable energy projects, such as solar and wind energy (Tlili, 2015), ongoing technological development is necessary to improve efficiency in resource management. Additionally, adopting carbon capture and storage technologies can help mitigate the adverse effects of fossil fuel consumption while ensuring economic vitality.

Opportunities that can arise from addressing these challenges

As one of the world's largest oil-producing nations, Saudi Arabia faces significant challenges posed by climate change. However, in tackling these challenges, the Kingdom has the opportunity to redefine its economic landscape, enhance its global standing, and meet the needs of its citizens. This section of study explores potential opportunities arising from addressing climate change challenges in Saudi Arabia, emphasizing sustainable development, economic diversification, technological innovation, and international collaborations.

Economic Diversification and Sustainability

Saudi Arabia's Vision 2030 underscores the need for economic diversification away from oil dependency (Al-Hayaly, 2022). By investing in renewable energy sources such as solar and wind, the Kingdom can reduce its reliance on fossil fuels. The Global Energy Transformation report by the International Renewable Energy Agency (IRENA, 2019) highlights the potential for significant job creation and economic growth associated with the transition to renewable energy (Gielen et al., 2019). This shift could empower local industries and create a resilient economy aligned with global sustainability goals.

Job Creation and Skill Development

Transitioning to a green economy offers immense job creation potential estimates that green investments could provide millions of jobs globally in sectors ranging from renewable energy to energy efficiency (McLennan, 2022). For Saudi Arabia, this means training a workforce capable of operating within these new industries. Investing in education and vocational training programs can equip Saudis with the necessary skills to thrive in a diversified job market, thus reducing unemployment while addressing climate goals.

Advancement in Technological Innovation

Addressing climate change challenges necessitates innovation in technology and infrastructure. Saudi Arabia has the potential to emerge as a hub for research and development in clean technology. The establishment of funds focused on sustainability, such as the Saudi Green Initiative, encourages private and public sector investment in innovative solutions (Ghanem & Alamri, 2023). This can lead to the development of cutting-edge technologies that make energy production and consumption more efficient and sustainable.

Enhanced Global Reputation

By taking proactive steps toward sustainable development, Saudi Arabia can enhance its global reputation as a leader in the energy transition. Participation in international agreements such as the Paris Agreement can demonstrate the Kingdom's commitment to addressing climate issues. This commitment not only aligns with global trends but also enhances the country's diplomatic relationships

and can attract foreign investments (Kukic, 2020). The credibility derived from such engagements can foster a more robust international image.

Tourism and Eco-Friendly Initiatives

The global tourism market increasingly prioritizes sustainability, leading to a growing interest in eco-friendly travel options. Saudi Arabia's rich cultural heritage and natural landscapes present opportunities for sustainable tourism (Alyusuf, 2021). By promoting eco-tourism initiatives and green travel options, the Kingdom can attract international tourists who value sustainability, generating revenue while showcasing its commitment to climate action.

Public Health Benefits

Climate change has direct implications for public health, particularly regarding air quality and extreme weather conditions (Amran, Amran, Alyousef, & Alabduljabbar, 2020). By reducing carbon emissions and mitigating climate change, Saudi Arabia can improve overall public health outcomes. Cleaner air and better living conditions can lead to substantial healthcare savings and a healthier workforce, enhancing productivity and quality of life for its citizens.

Investment in Water Conservation Technologies

Water scarcity is a critical issue in arid regions like Saudi Arabia. The challenges posed by climate change exacerbate this issue (Singh & Chudasama, 2021). By investing in innovative water conservation technologies, the Kingdom can enhance its water security. Advanced desalination techniques, water recycling, and sustainable agricultural practices can not only address immediate water scarcity but can also promote long-term ecological balance and sustainability.

Mobilizing Financial Resources

Addressing climate change presents an opportunity for Saudi Arabia to leverage financial resources more effectively. Green financing mechanisms, such as green bonds, allow for investment in sustainable projects while attracting environmentally-conscious investors (Versal & Sholoiko, 2022). Such financial innovations can support the country's transition to a green economy, promoting accountability and transparency in funding climate initiatives.

Saudi Arabia responses to Climate crisis

Saudi Arabia, one of the world's largest oil producers, finds itself at a critical juncture concerning climate change. The nation's economic dependency on fossil fuels has historically positioned it as a significant contributor to carbon emissions. However, recent shifts in domestic and international pressures have prompted the Kingdom to reassess its strategies regarding environmental sustainability. This section of research paper explores how Saudi Arabia is responding to the climate crisis through policy adaptation, renewable energy initiatives, and international collaborations.

Vision 2030: A Pathway to Sustainability

In 2016, Saudi Arabia launched its Vision 2030 program, which aims to diversify the economy away from oil dependency and promote sustainability (Habibi, 2019). As part of this initiative, the Kingdom has committed to cutting greenhouse gas emissions, increasing the share of renewable energy in its energy mix, and enhancing energy efficiency. Vision 2030 represents a broader recognition of the need to address climate change, making a remarkable pivot from its traditional economic model towards a more sustainable framework.

Renewable Energy Initiatives

Saudi Arabia is investing heavily in renewable energy sources, particularly solar and wind. The National Renewable Energy Program aims to generate 58.7 GW of renewable energy by 2030 (Tlili, 2015). This ambitious target includes the construction of the world's largest solar plant, the Sakaka PV IPP project, and a focus on harnessing wind energy in regions with high potential. By transitioning towards renewables, Saudi Arabia is making strides in reducing its carbon footprint while creating new jobs in emerging sectors.

Carbon Capture Technology

In tandem with renewable initiatives, Saudi Arabia is exploring carbon capture, utilization, and storage (CCUS) technologies. These technologies are designed to capture up to 80-90% of CO₂ emissions from power plants and industrial sources (Lau, Ramakrishna, Zhang, & Radhamani, 2021). The Kingdom has already initiated several pilot projects, including the Uthmaniyah CO₂-EOR project, which demonstrates its commitment to mitigating greenhouse gas emissions while maintaining its petroleum industry operations.

International Partnerships and Agreements

Saudi Arabia recognizes that climate change is a global issue that requires collective action. The Kingdom has pledged support for the Paris Agreement, committing to targets that align with global efforts to limit temperature rises (Raiser, Çalı, & Flachslanđ, 2022). Additionally, it has engaged in collaborative projects with various nations to enhance environmental sustainability, including partnerships aimed at developing green technology and sharing best practices.

Greening the Oil Industry

The Kingdom's approach to addressing climate change also includes efforts to "green" its oil industry. The Saudi Aramco Sustainability Report outlines initiatives aimed at reducing the environmental impact of oil extraction and refining processes (Mirzayev, 2022). These initiatives focus on reducing methane emissions, improving water management, and promoting biodiversity in areas surrounding oil fields, showcasing the company's commitment to sustainable practices within the fossil fuel sector.

Local Environmental Initiatives

In addition to large-scale projects, local environmental initiatives are crucial for addressing the climate crisis. The 'Green Saudi Initiative,' launched in 2021, emphasizes reforestation and preservation of natural ecosystems (Khayat, Felemban, Altowairqi, & Aljahdali, 2023). This program seeks to plant billions of trees and reduce carbon footprints at the community level, further integrating sustainability into the national lifestyle.

Economic Diversification and Green Investment

Transitioning to a sustainable economy requires substantial financial investment and innovation. Saudi Arabia is actively seeking to attract foreign and domestic investments in green technologies. The Green Investment Strategy, part of Vision 2030, promotes sectors such as renewable energy, and sustainable agriculture, aiming for a more resilient economy (Ghanem & Alamri, 2023). By generating green jobs and fostering technological innovation, the Kingdom aspires to lead the region

Conclusion and Recommendations

Climate change is increasingly recognized as one of the most pressing global issues of our time, with far-reaching implications for countries around the world. For Saudi Arabia, a nation heavily reliant on oil exports, the threats posed by climate change are particularly acute. Rising temperatures, shrinking water resources, and extreme weather events threaten not only the natural environment but also the economic infrastructure that forms the backbone of the Saudi economy. However, amidst these challenges lie opportunities for innovation, diversification, and leadership in sustainable practices that could redefine the Kingdom's future.

One of the most significant challenges Saudi Arabia faces is its vulnerability to water scarcity and extreme heat. The Kingdom is located in one of the world's driest regions, and climate models predict that rising temperatures will exacerbate water shortages. This situation poses serious risks to agriculture, health, and overall quality of life. As the temperature increases, traditional farming practices may become unsustainable, necessitating the urgent adoption of water-efficient technologies and alternative agricultural practices, including the integration of desalination and hydroponics.

Economically, the reliance on oil exports exposes Saudi Arabia to the risks of fluctuating oil prices and changing global energy trends. As international pressure to transition to renewable energy sources intensifies, the Kingdom faces a unique challenge in maintaining its economic stability while diversifying its energy portfolio. The Vision 2030 initiative outlines ambitious plans to reduce dependence on oil and invest in renewable energy, with a particular focus on solar and wind energy. This shift not only signals a response to climate concerns but also positions Saudi Arabia to potentially become a leader in the global renewable energy market, creating jobs and fostering innovation in technology.

The youth demographic of Saudi Arabia presents a unique opportunity for addressing climate change. With over 60% of the population under the age of 30, there is significant potential for engaging young people in sustainability initiatives and environmental stewardship. By investing in education and training programs focused on green technologies and sustainability practices, the Kingdom can harness the creativity and innovation of its youth to tackle climate challenges. Empowering young Saudis to take part in climate action can also drive community engagement and foster a culture of sustainability that extends beyond government policies.

In brief, while Saudi Arabia faces considerable challenges due to climate change, these obstacles also present profound opportunities for transformation. By embracing technology and investing in sustainable practices, the Kingdom can not only protect its economic interests but also take a proactive role in the global fight against climate change. By positioning itself as a leader in renewable energy and empowering its youth, Saudi Arabia has the potential to create a resilient and sustainable future—turning the challenges of climate change into a catalyst for progress and prosperity.

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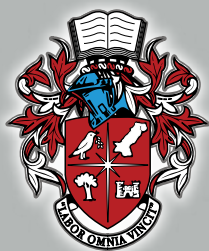
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