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Review Article

A Review of Green Economy in Cambodia: Applications, Challenges and Future Directions

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Abstract *- Even though industrialized countries contribute to global warming, poorer and less developed countries suffer the most severe consequences, despite their lesser contributions. Governments and groups are combating climate change. Nations have "Nationally Determined Contributions" to reduce global warming under the Paris Agreement. Given Cambodia's limited resources, many of these contributions are overly ambitious. This article examines Cambodia's declared climate change position, environmental practices, mitigation strategies, and activities by examining waste, deforestation, and greenhouse gas emissions. This study combines content and document-based analyses of Cambodian groups affected by climate change. According to research, Cambodia is tackling climate change. Current environmental practices and policies place economic growth and development ahead of climate and the environment. Furthermore, wealthier countries should assist LDCs in setting and maintaining realistic climate objectives to achieve Agenda 2030.*

Keywords *- Greenwashing, Climate change, Green public relations.*

1. Introduction

Cambodia's countryside is about four times bigger than Estonia's and about one-fourth as big as the United Kingdom's. Southeast Asia is surrounded by Thailand, Laos, the Gulf of Thailand, and Vietnam. Cambodia comprises mountains, the Mekong River, and Southeast Asia's most extensive body of water. Cambodia has three different types of land, and the southwest is where most palm oil, fishing, and water-related businesses are. In the north and northeast, mountains, plateaus, and mangrove forests predominate. Due to the flat terrain and marshes, most agricultural producers cultivate their fields in the middle of the country, where the Tonle Sap Lake flows. No Cambodian province is immune to climate change (Smith, 2019). Other Indo-China adjacent nations, such as Indonesia and the Philippines, have also been devastated by natural catastrophes.

Annual droughts and floods have proven extremely detrimental to Cambodia. In 2013, excessive rainfall during the rainy season forced the Mekong River to burst, resulting in storms and severe floods. Later that year, around 2 million people in 20 provinces were severely affected, and nearly 200 people died (MRC, 2015). Also, from 2015 to 2017, 25 of Cambodia's provinces ran out of water because of a drought that affected many of its neighbors and was considered the worst case in 50 years ("Asia and the Pacific," 2016). Over 600,000 Cambodian households were hit hard by the droughts.

A large percentage of the country relies on fishing and farming as their primary sources of income. As a result of the country's weak infrastructure and developmental concerns, Cambodia is ranked as one of the world's poorest nations. Additionally, the country's poor economy and location make it more challenging. On a rating scale with ten denoting "high risk," Cambodia is classified as "high risk" for disasters related to climate change. According to the Disaster Risk Index, more than 9.5 million Cambodians are at risk of flooding, 4.4 million people were killed by tsunamis and 3.9 million by cyclones (Disaster Risk Management Knowledge Centre, European Commission, 2018). Floods and droughts have been induced by human activities that affect plant and animal ecosystems and humans, resulting in significant environmental and climate change concerns in the country (Borg, 2011). International agreements like the Kyoto Protocol and the Paris Agreement, as well as unlawful human activities, climate change, and other issues, still influence many countries and areas. Poor infrastructure, terrain, and an expected population boom will exacerbate already-dangerous climate conditions, placing Cambodia among the world's ten most vulnerable nations regarding climate change's effects.

Specifically, this paper addresses four pertinent questions: (1) What are Cambodia's efforts to tackle climate change? (2) How ecologically friendly is Cambodia, or is it simply pretending to be? (3) What, if anything, has Cambodia accomplished in mitigating climate change? (4) What is Cambodia's actual situation regarding environmental practices? This study aims to assess Cambodia's environmental policies to establish if the country strives to be environmentally conscious through its actions or if it is simply "greenwashing." In other words, this article investigates Cambodia's environmental practices, regulations, and initiatives using

the ideas of greenwashing, blue washing, and green public relations to assess if the government is dedicated to global climate change resistance tactics.

This study seeks to contribute to the existing body of knowledge on climate change in Cambodia by investigating climate governance at the local and global partnership levels, as well as the role played by all stakeholders in climate change mitigation and adaptation (Käkönen, Lebel, Karhunmaa, Dany, & Try, 2014). While other studies investigate the relationship between climate change and least developed countries from the perspectives of adaptation, economic migration, and participation in global warming networks (Cornell, 2010; Lilleør & Van den Broeck, 2011; Huq et al., 2004), a greater understanding of how the Sustainable Growth Goals (SDGs) may better align Cambodia's economic development values and goals with global sustainability pledges would be of great importance. It makes sense, given that governments aiming to build their economy know the difficulty of adhering to and achieving the Sustainable Development Goals.

1.1. Cambodia in the Anthropocene: the problem of "Greenwashing."

Since pollution has worsened, many corporations devote greater attention to the environment (Guo et al., 2018; Scanlan, 2017; Zhang et al., 2018). Many stakeholders are becoming more conscious of environmental concerns as environmental problems deteriorate and people become more aware of them (Chen & Chang 2012). Investors, customers, governments, and companies have pushed firms to reveal their environmental performance during the past decade (Kim & Lyon, 2015; Marquis et al., 2016) and to guarantee that products do not hurt the environment (Guo et al., 2014). Based on their investigation, Khalil and O'sullivan (2016) assert that "greenwashing" is hypocritical and dishonest. Claasen and Constredo suggest that businesses with poor corporate social responsibility (CSR) and strong public relations (PR) visibility are more likely to engage in greenwashing, according to their hypothesis (2017). This disparity may manifest itself in various ways, including increased operational efficiency and transparency. The company appears to be functioning better than it is due to inconsistent presentation.

While greenwashing is widespread in the industry, most tactics do not involve explicit deception. For instance, when people are concerned about global warming, greenhouse gases, logging, species extinction, and resource depletion, it makes sense for organizations to become environmentally conscious. Aside from that, businesses have learned that doing good may be beneficial to their bottom line. For example, some companies are guilty of greenwashing, despite the growing importance of CSR and green marketing. Greenwashing often happens when an organization's environmental actions do not match its environmental promises (Lyon & Montgomery, 2015). Greenwashing occurs when a corporation attempts to get the benefits of a green image without operating sustainably. However, the rise of "greenwashing" makes many skeptical about CSR (Aji & Sutikno, 2015; Nyilasy, Gangadharbatla, & Paladino, 2014).

Nielsen Media Research 2015 says that consumers worldwide are willing to spend an extra 66 percent of their incomes on items that are good for the environment. Because of this, people may be willing to pay more for products from companies they think are socially responsible (Grimmer & Bingham 2013; Guo et al. 2014). CSR is becoming more critical to business leaders as a way to address these issues. CSR is "the deliberate incorporation of community and environmental concerns into a company's economic pursuits and exchanges with its stakeholders" (European Commission, 2011). To successfully include socio-ecological issues in operational activities, companies must show that they are economically and socially responsible and have a long-term commitment to the community (Antunes et al., 2015).

Conversely, they should put people, the planet, and profit before the economic, environmental, and social performance (Fernandes, 2022). Sustainable development is growth that meets the needs of the present without putting the ability of future generations to meet their own needs at risk (Khan et al., 2021). The increasing demand "forces companies to adopt green marketing strategies to demonstrate their positive business image and social responsibility to consumers" (Zhang et al., 2018, p. 740). Also, sustainable business models (SBMs) include the triple bottom line (TBL) and make sure that the environment and society as a whole are taken into account (Bocken et al., 2014). As a result, they are critical for leading and implementing creative company activities for sustainability, such as reducing, pausing, and completing the resource cycle (Geissdoerfer et al., 2017). That is why they are crucial in creating a comparative advantage for the company (Bocken et al., 2014) and sustainable development (SD). In addition, Web 2.0 introduces new social media technologies, allowing stakeholders to engage in novel Internet-based forms of interaction and information exchange. For instance, firms' websites and social media platforms significantly impact the interactions and contacts between businesses and the many stakeholders they serve. (Fieseler et al., 2010).

1.2. Failure of imagination: senses and derangement

The 1999 establishment of the United Governments Global Compact was forced by the inability of nations to follow, execute, and audit treaties on human and labor rights. However, debates on bluewashing cannot proceed without addressing the Global Compact. This project enables firms to directly work with the United Nations on its 10 tenets, among which global warming is one of the imperative existing challenges. This agreement ensures that participating businesses comply with the guiding principles on labor laws, human rights, and, most crucially, environmental protection. In exchange, these companies may identify as United Nations partners and use the UN

emblem in marketing materials, publications, and reports. In addition, the United Nations Worldwide Compact aims to "organize a worldwide movement of sustainable enterprises and communities to build the kind of society we desire." (United Nations Global Compact, 2000).

The United Nations Global Compact plan consists of ten major features to which the UN must comply. This schedule's seventh, eighth, and ninth sections are about the environment. They urge Global Compact partners to utilize minerals and natural resources in environmentally responsible ways and embrace bio-friendly business methods. Firms that are signatories to the UN Global Compact are at the focus of various debates. First, corporations are not required to do anything other than submit a yearly report that is not verified nor appraised, even though the Global Compact suspends the membership of firms that do not submit yearly reports. Second, most non-governmental organizations believe that these firms have misused the UN partnership by failing to comply with the partnership's established conditions. It is called "bluewashing" in the realm of climate change. (Rampton (2002).

Bluewashing is when a company or group promotes responsible behaviors that do not match their business to gain positive publicity. For instance, blue washing is possible because of the disconnect between the Sustainable Development Goals and ESG (environmental, social, and [corporate] governance). This operational gap occurs when a corporation's goals, plans, and responsibilities on a micro-level align with the macro-level political objectives of the SDGs. Hence bluewashing is a kind of marketing that, like greenwashing, attempts to showcase a company's green credentials without really making any substantial environmental or ethical improvements. Many people believe that bluewashing is the new greenwashing.

To be ahead of the curve, some businesses will want to engage in greenwashing in light of the increasing significance of corporate social responsibility and green marketing. Greenwashing often implies a disparity between an organization's environmental claims and its actual environmental performance. It places the organization somewhat on a continuum of shades of green (SOG). Unfortunately, no published data currently distinguishes the intensity of greenwashing. To facilitate the implementation of minor ambiguous forms of greenwashing, Lyon and Maxwell's description of a real-world example serves as inspiration (2011). We can distinguish between behavioral-claim greenwashing (a mismatch between environmental claims and environmental behavior) and motivation greenwashing based on their case description (an inconsistency between conveyed and genuine reasons for environmentally friendly behavior). Accordingly, there are three types of greenwashing: those who tell the fact, those that tell a partial truth (trivial lies), and those that tell an outright lie. Hence, if a company is trying to use its green image as a marketing tool, the most crucial message is that honesty and explicit messaging on ecologically responsible conduct pay dividends. Simply an authentically green posture can be advantageous. When making accusations of greenwashing, it is essential to talk about what the organization is trying to do. Greenwashing can hurt a company's reputation in a big way only if consumers think the company lied on purpose about how well it takes care of the environment (de Jong et al., 2020).

1.3. Perspectives of green public relations

In recent years, the word "green" has been used in almost every field, from making food to making clothes. Businesses, corporations, and government agencies soon realized that being good to the environment was becoming the norm and that if they did it right, they could make more money from it. It leads to a race to the finish line bypassing the process of being green. Instead, these organizations lie about facts in their ads, reports, and other materials to make it look like they are taking care of the climate.

Environmental concerns have compelled many businesses to employ the eco brand, which has also permeated the realm of public relations, giving rise to the idea of green public relations. Green public relations is a branch of public relations that conveys environmentally friendly practices through business CSR initiatives and other public communication activities. The objective is to raise brand recognition and improve its corporate image (Sarvaes 2013). Green public relations is directly tied to environmental concerns affecting enterprises or businesses. For example, environmental public relations difficulties that have or have not occurred to the firm will cost a lot of money. Integral to corporate marketing operations is the management of environmental profiles and relationships. Thus, green public relations aims to demonstrate concern for the environment and involves the sharing or non-sharing of environmental practices (United Nations Global Compact, n.d.). Also, they do not keep quiet about the parts of their work that might be green or good for the environment, nor do they try to hide them. This way, bad habits look good, and good habits get the same attention. So why do countries or businesses do green public relations? The answer is simple: by getting known domestically and worldwide.

Corresponding to the EPI (Environmental Performance Index), Denmark is the greenest country out of 180 (Environmental Performance Index, 2022) countries, followed closely by the United Kingdom and Finland. This strategy has gained Denmark a reputation and acts as an example for countries aiming to be better by utilizing renewables; other alternatives include structural designs enabling a greener and healthier ecosystem for everyone. Consequently, green public relations may be necessary to develop and maintain an accurate view of one's environment and climate. This realistic image can be shown to the public through the media and other forms of communication. In Cambodia, for example, the DCC (Department of Climate Change) is the principal bureau in

charge of all climate-related activities and the environment. The agency also speaks for Cambodia on climate change issues in the region and worldwide. It is split into five other departments for the Department of Climate Change to do its job well. The Office of Information Management oversees Green Public Relations for the DCC. Its primary responsibilities are to "create, build, and administer a climate change information and knowledge management system" and to "communicate the government's action to greenhouse gas emissions with the population, aid agencies, and the global institutions" (General Secretariat of the National Council for Sustainable Development, 2014). Apart from deciding what is published or transmitted, the Cambodian Office of Information Management is also the Cambodian Government's Public Relations Office. Through green public relations, Cambodia informs the international community about its environment and climate. When analyzing Cambodia's actual stance on combating climate change, a number of these methods will be analyzed.

1.4. Cambodia's climate change policy

This section explores the official stance of Cambodia concerning climate change in the region and globally. In assessing whether or not specific food production methods, land use, water resource utilization, and other environmental practices are environmentally beneficial or harmful, the government considers factors like global warming and ecological patterns of waste disposal and recycling, pollution reduction, mining, and resource extraction.

Waste management in Cambodia is a huge problem because of Cambodia's high population density, rising income, and escalating urbanization. In addition, there is an absence of appropriate waste collection and treatment facilities and technical staff, as well as clearly defined responsibilities for the waste management team members. Furthermore, the IGES Centre for coordination with UNEP on Environmental Technologies (CCET) is supporting Cambodia's Waste Management Division of the Phnom Penh Capital Hall (PPCH) in drafting a waste management strategy for Phnom Penh from 2018-2035. The trash management strategy is thorough. It applies to all waste streams (solid waste, liquid waste/wastewater, and gaseous emissions), focusing on solid waste and embracing other forms that fall within the purview of PPCH. A rapid study was conducted on Phnom Penh's current waste management processes and existing policies, such as waste flow, regulations and legislation framework, and waste management practices challenges. This study also provides concrete advice for PPCH and the senior management team for achieving sustainability within Phnom Penh.

Undeniably, Phnom Penh's waste management system has various gaps and deficiencies. Increasing waste volume, absence of data and information on existing waste management systems, inadequate waste management facilities, shortage of resources, ambiguous culpability by responsible departments, lack of waste treatment technology, and poor household and business management continue to impede holistic waste management in Phnom Penh. Apart from the solid waste collected and taken to landfills, a lot of the city's trash is burned or dumped in the open, which is terrible for the environment and the public. Mismanagement of waste, such as not separating waste at its source, mixing household and hazardous waste, and not having enough recycling and treatment facilities, is still a big problem for Phnom Penh's growth. Unquestionably, Phnom Penh's trash management system has several flaws and weaknesses. First, increasing waste volume, lack of data and information on existing waste management systems, inadequate waste management facilities, lack of resources, unclear culpability by the team responsible, lack of waste treatment technology, and poor household and business managers continue to impede Phnom Penh's comprehensive waste management. Second, a large portion of the city's garbage is burnt or thrown in the open, which is dreadful for the environment and the population. Third, mismanagement of trash, such as failing to separate garbage at its source, combining household and hazardous waste, and a lack of recycling and treatment facilities, continues to be a significant obstacle to Phnom Penh's economic development.

Indeed, climate action is a long and complicated process that corporations go through and are at different stages and levels of development, vis-a-vis from revealing their risk characteristics to setting goals and achieving them through government policies and guidelines. And increasingly, firms are prepared for a low-carbon economy as they move forward on this road of progress. So it is therefore imperative for government institutions, commercial sectors, and non-governmental organizations (NGOs) to be in close partnership with the NCCC (National Climate Change Committee); to implement responses to climate change. Further, the CCCSP(Cambodia Climate Change Strategic Plan) enables Cambodia to progress toward becoming a zero-waste nation (ZWN). Nonetheless, Cambodia's objective for sustainable waste management cannot be realized without strong community engagement. Changing behavior requires a shift in mental models. In addition to reaching out to community groups, the government can implement a policy to teach young individuals to increase environmental consciousness in the community.

1.5. How Cambodia deals with trash and pollution

The Cambodian SDG Framework (MOP, 2019) provides a nationally-adapted set of goals and objectives, providing benchmarks and deliverables for enabling strategic delivery management and governance. Additionally, the SDGs fit in with the RGC's (Royal Government of Cambodia) long-term development objective, Vision 2050, and its intermediate programs, the RS-IV and NSDP 2019-2023. (National Strategic Development Plan). These initiatives strive to facilitate the country's ascent to upper-middle-income and subsequently high-income status based on socioeconomic inclusivity and environmental sustainability. Therefore, the

imperatives of achieving equitable development and leaving no one behind, maintaining Cambodia's natural resource wealth, and tackling the challenges presented by climate change are completely integrated into the policy approach.

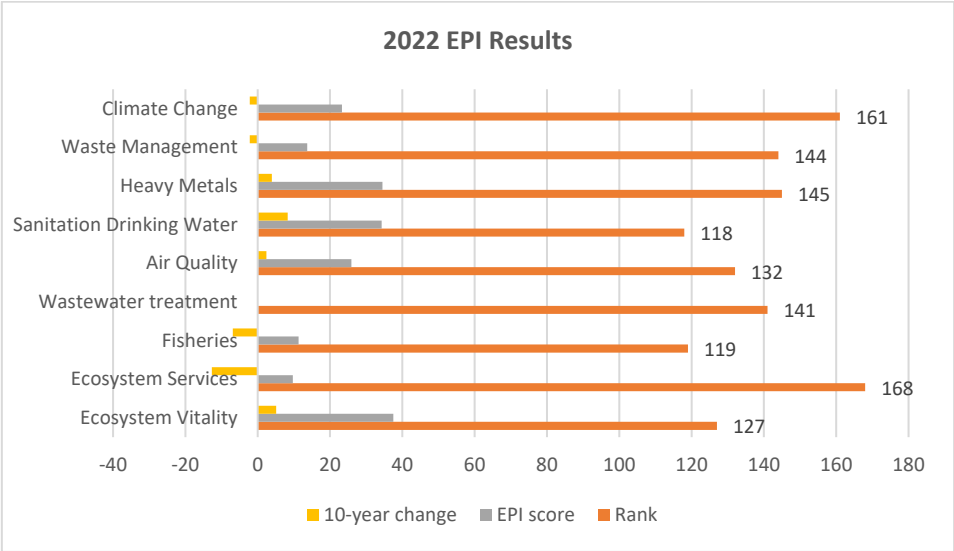
The basic information on the country profile of Cambodia is presented below in Table 1:

Table 1. Country profile

Geographical location	South-Eastern Asia
Land Area	181,035 km²
GHG emissions profile	The total emissions of greenhouse gases (GHG) estimated are 163,592 Gg.CO_2-eq in 2016, which is 285% higher than that of in 1994. The main driver for this increase in GHG emissions is the deforestation reflected in the emissions of the FOLU sector (GSSD, 2020b).
Key emitter sectors	Energy, Industrial Processes and Product Use (IPPU), Agriculture, Forestry and Other Land Use (AFOLU), and Waste (GSSD, 2020b)
Key climate risks	Floods, droughts, tropical storms and vector-borne diseases
Vulnerable sectors	Agriculture and water resources, forestry, coastal zones, and human health (GSSD, 2020a)

Source: adapted from GCF 2021

Cambodia's position on the EPI in 2022 is 154 out of 180 nations, dropping from 2016's ranking of 146. Cameroon, Angola, and Burundi (tie) occupy the 151st, 152nd, and 153rd positions, respectively. As illustrated in Figure 1, Cambodia placed 132nd in air quality, 127th in ecosystem vitality, 161st in climate change policy aim, 118th in sanitation and drinking water, etc., on the Environmental Index Performance scorecard (Environmental Performance Index, 2022).



Source: Environmental Performance Index 2022

Fig. 1 Cambodia's 2022 EPI Scorecard

Cambodia's climate and environment have been affected in the last few years by its growing population and economy. One of the most significant effects is waste and pollution, substantial waste and air, water, and land pollution (Waste and pollution 2021).

According to several news sources and publications, waste disposal has been a serious problem in Cambodia for the past four or five years, with the majority of coverage focusing on Phnom Penh, the country's capital (Sassoon & Channyda, 2018). However, what occurs in the capital is identical to what occurs in the rural and other provinces. People are getting rid of the trash incorrectly, which worsens when it rains. It is blamed on more people living in the area. Because the number of people living in Cambodia's 25 provinces is proliferating, more trash is being generated in markets, shops, homes, and restaurants.

The Cambodian government has said unequivocally that civil service activities must be improved, and it has

urged that state institutions and public entities be overhauled. In light of this, the strategy for establishing the SWM (solid waste management) service considers the following three factors: (1) services backed by the government; (2) services provided by the informal sector; and (3) partnerships between the public and private sectors (Spoann 2018). Based on these principles, reforms were implemented to improve solid waste management. Roles, rights, and legal responsibilities were laid out in sub-decree 113, the inter-ministerial communiqué, and Phnom Penh's edict on urban solid waste management. The goal of decentralizing institutional roles and responsibilities is to improve service quality and the awareness of safeguarding the environment (RGC 2015). But after policy reform, the difficulty that needs answering is, "What obstacles and limits have public sector bodies encountered in carrying out these rights and responsibilities?" This inquiry stems from worries about Cambodia's environmental health and the government's commitment to climate change. This article will examine if the Cambodian government's efforts to combat climate change are genuine or only an attempt to dodge the issue via greenwashing. We must keep in mind that everyone approaches this issue differently.

It is necessary to reflect, evaluate the concern behind the query, and assess the government's actions to date. Municipal solid waste (MSW) is transported 16 kilometres from central to the Dangkor district disposal site. The site has been operational since 2009 and was designed to be a sanitary landfill. CINTRI (note: CINTRI is a garbage collection company contracted with waste collection by the municipality of Phnom Penh) and is mandated to execute daily clean-up and rubbish removal to the landfill (see Figure 2). Unfortunately, uncollected garbage is an additional issue; around 100-200 tons of waste are not collected and are instead self-treated (Denney 2016). However, uncollected garbage is also a problem; between 100 and 200 tons of waste are not collected but instead are treated manually (Denney 2016) via burning, burying and even dumping garbage in community open areas (Denney 2016; COMPED 2014). As a result, trash disposal procedures became a source of contention among stakeholders. Focus group discussions (FGD) in Cambodia reveal a significant decline in the number of complaints and replacing particular waste heaps with huge containers. It is mainly because of the transfer of SWM duties to local governments and the passage of sub-decree 113 on urban waste management.

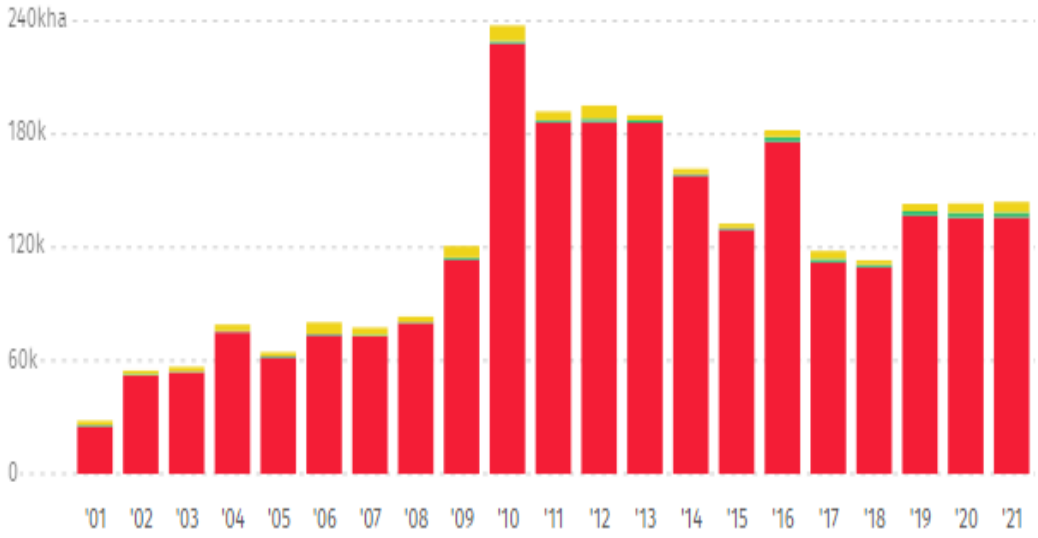
Source: photo credit Hong Menea

Fig. 2 The capital's main dumpsite in the Dangkor district

Circling back to Cambodia's waste management method is far from ideal since landfilling is a harmful way to dispose trash. Figure 3 shows that as landfill wastes decompose, they discharge heavy pollutants into water bodies, harming marine life. Additionally, toxic pollutants permeate the soil and ground, causing long-term harm to people, organisms, and plant life. These waste materials contain lead, mercury, and leachate. Invariably, when garbage is put in landfills, it is burnt or cremated, releasing toxic pollutants into the environment. In a similar vein, cutting down trees for commercial purposes should result in an increase in the amount of carbon dioxide in the atmosphere. According to the World Resources Institute, Cambodia was the country that lost the most forest cover each year between 2001 and 2014.

From a statistical standpoint, in 2010, Cambodia's natural forest covered 7.22Mha or 42 percent of its land area. In 2021, 141 hectares of natural forest were destroyed, equating to 83.2 million tons of CO_2 emissions. Between 2001 and 2018, Cambodia lost over 2,2 million hectares of tree cover, and the yearly loss rate climbed by nearly 300 percent. Since 2001, Global Forest Watch's Dashboards indicate that Cambodia has lost around 24 percent of its tree cover, a far more considerable proportion than bigger, forested nations such as Brazil and Indonesia (Curtis et 2021). Deforestation was the primary factor in 96 percent of the tree cover loss in Cambodia

between 2001 and 2021 (Curtis et al., 2019). This trend was driven by five different factors, e.g.(1) commodity-driven deforestation: massive habitat loss tied mostly to the growth of commercial agriculture, (2) changing agriculture: short or long-term deforestation attributable to micro and moderate agriculture, (3) Forestry: Transient loss through crop and forest land harvesting, with some main forest destruction. (4) Wildfire: due to lack of access, excluding fire suppression for agricultural purposes (5) Urbanization: destruction for urban center growth (see Figure 3)



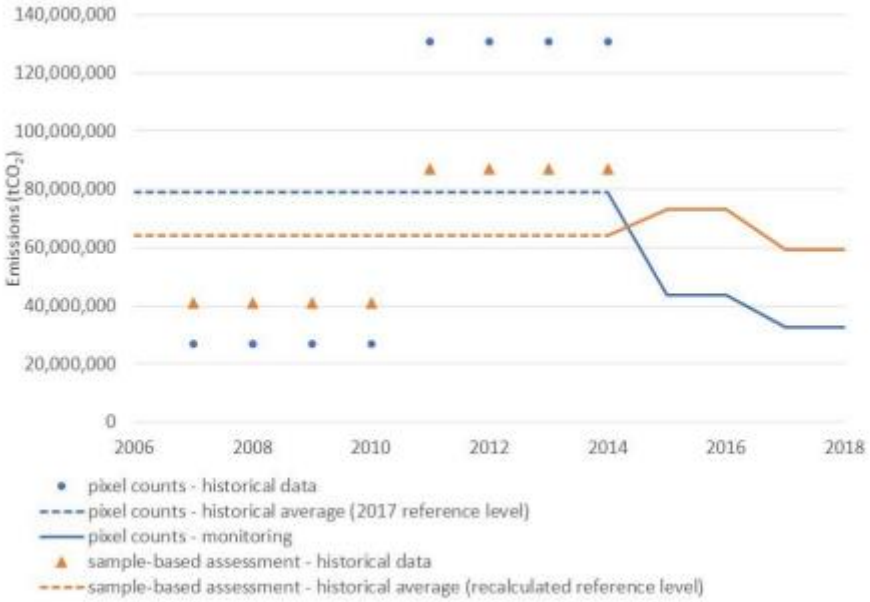
Source: Curtis et al., 2019

Fig. 3 Annual tree cover loss in Cambodia

1.6. Cambodia's attitude towards deforestation

Previous research has shown that deforestation is the most significant reason for climate change problems. To curb global warming to 1.5 degrees Celsius, reducing emissions and removing CO_2 from the atmosphere is vital (IPCC 2018). Deforestation and forest degradation are responsible for 11% of world carbon emissions (IPCC, 2014), even though poorer nations account for 98% of deforestation (FAO 2020). REDD+ (or Reducing Emissions from Deforestation and forest Degradation) is an essential climate change mitigation tool for forests (lowering emissions from logging and the responsibility of sustainable protection of forests and boosting forest carbon stocks in developing countries). REDD+ was established upon UNFCCC (United Nations Framework Convention on Climate Change) because forest management in emerging nations is vital for climate change mitigation.

Cambodia is dedicated to preserving its forestry cover and mitigating climate change following ASEAN and UN objectives. In addition, it has created several environmental policies, including the Cambodia Climate Change Strategic Plan (Policies and Plans, 2013) and, more crucially, the Cambodia Climate Change Action Plan, which is being used from 2014 to 2023. Together with other climate and environmental stakeholders, the Cambodian government put some ministries and agencies in charge of ensuring these policies are carried out, monitored, and evaluated. It is noteworthy that Cambodia gave the UNFCCC a reference level (General Department of Environmental Knowledge and Information 2017), and included in the results of REDD+ is a technical appendix to the General Department of Environmental Knowledge and Information 2020's biannual update report (see Figure 4).



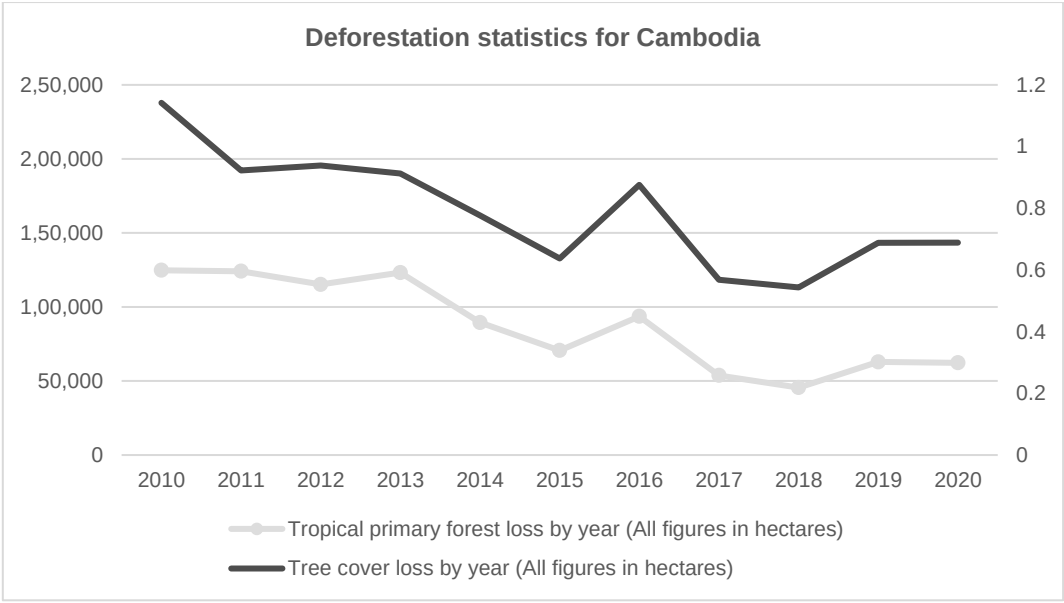
Source: General Department of Environmental Knowledge and Information 2020

Fig. 4 Emission estimates of Cambodia

Cambodia has elevated levels of deforestation and forest degradation but lacks the expertise and funds to meet the ongoing difficulties of reducing emissions. Cambodia's REDD+ plan comprises guidelines and initiatives aimed at reducing emissions caused by deforestation and forest degradation. These guidelines and initiatives are likely to have long-term consequences when they are developed. So, to meet the REDD+ requisites, Cambodia changed the forest classification to say: "Under the REDD+ package, a forest is any marshland or dryland that is surrounded by natural or planted vegetation and has a size of at least 0.5 hectares, a height of at least 5 meters, and a canopy crown cover of at least 10%." (Cambodia Ministry of Environment, 2018).

1.7. Forestry practices in Cambodia

According to the findings of recent studies, one of the primary contributors to the difficulties resulting from climate change is the destruction of trees (Lawrence & Vandecar, 2015; Tinker, Ingram, & Struwe, 1996; Moutinho & Schwartzman, 2005). As a result of rising global demand and pricing for rubber, tree forests in Cambodia are being converted into rubber plantations. In addition, there is a correlation between the felling of trees in Cambodia and the country's need for rubber, according to the findings of certain specialists (Erickson-Davis, 2017). There is an attempt at greenwashing and some public relations for the environment. For example, the term "greenwashing" refers to Cambodia's practice of making it seem as if it is making progress or has made progress on various environmentally significant policies, initiatives, and projects. Despite this, it does not address the economic land concessions or the reality that its rules cannot be enforced. As part of its attempts to expand its economy, Cambodia continues to provide land concession permits to foreign businesspeople while the government takes minimal measures to dissuade tree cutting. Conversely, there is no mention in these property transactions of trees being chopped down and forests being burnt for business interests (see Figure 5).



Source: Citation: Mongabay. "Deforestation statistics for Cambodia". Accessed on 29-Jun 2022 from rainforests.mongabay.com

Fig. 5 Deforestation statistics for Cambodia

These parcels of land have been lawfully designated for agricultural production by the government. Nevertheless, according to Global Forest Watch (2021), Cambodia lost 2.60Mha of tree cover from 2001 to 2021, a 30 percent drop in tree cover since 2000 and 1.55Gt of CO_2 emissions. According to a report that echoes the warnings of the science advocacy group Union of Concerned Scientists, this has been a substantial driver of climate change and the endangerment of people, vegetation, and living organisms (Erickson-Davis, 2017).

Some of South East Asia's oldest and most varied forests are said to be in Cambodia (Janssens, 2018). Reports say Cambodia has given long-term rights to companies like the Economic License Concessions to develop agricultural land. Because these companies did not follow transparency rules in their work, Cambodia discovered that 90% of the harvested wood was sold illegally. Consequently, Cambodia outlawed tree felling and employed rangers to monitor as much of the forest as possible. But in reality, thousands of trees are cut down daily for farming "development" (Janssens, 2018). Only a few licenses were rescinded, and most have not shown that they follow Cambodian forest laws and rules.

It is a prevalent practice to cut down valuable and rare trees to sell their products in other locations (Ramage et al., 2017). These actions endanger animals and lead to the emission of millions of tons of greenhouse gases. In addition, there have been claims that environmental activists investigating illegal forestry activities are targeted. The majority of government-approved food producers are interested in Rosewood, a rare tree species whose wood is ideal for furniture and flooring, according to the report. Cambodia is home to the few surviving rosewood trees in the area, and the species is likely to go extinct by 2026 (Janssens, 2018).

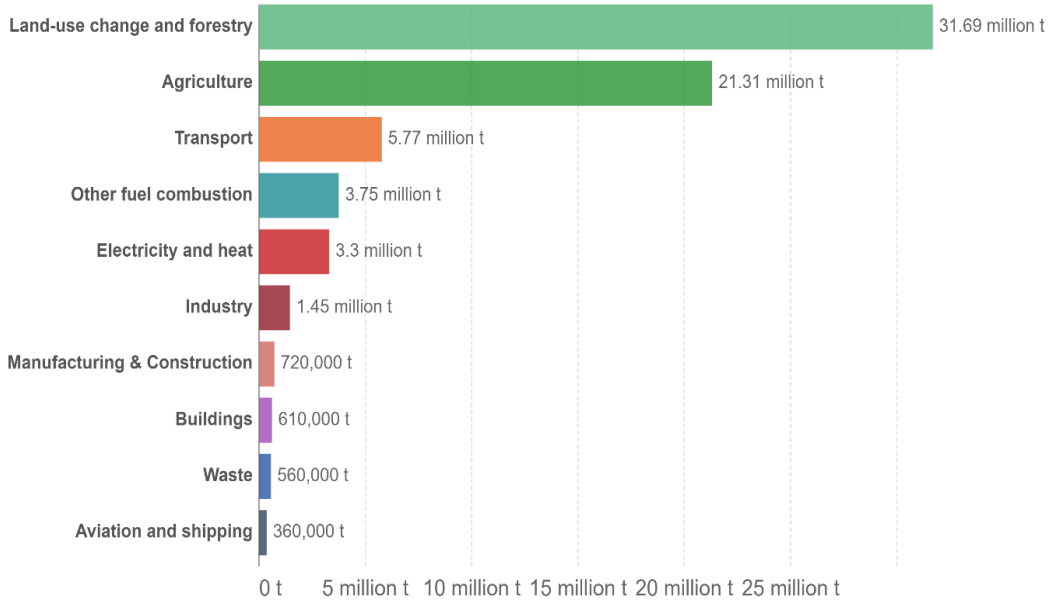
At this pace, one wonders if Cambodia cares about its endangered woods and environment. Yet, despite hundreds of illicit forest companies, the country thrives. By using force and law enforcement, prosecuting perpetrators, and punishing them, Cambodia's government may take a more proactive role in eradicating the practice. Cambodia is susceptible to climate change and recognizes the need for decisive action. Cambodia has reacted regularly to worldwide demands for climate change action, keeping with its powers and duties under the UN Framework Convention on Climate Change (National Council for Sustainable Development 2021).

1.8. Cambodia's GHG stance

Climate change efforts in Cambodia are tied to economic growth and poverty reduction. In addition, the INDC includes initiatives to reduce poverty, such as building adaptive community ability and repairing the natural ecological system to adjust to climate change. Variations to initiatives are prioritized in the proposal sent to INDC (Cambodia's Intended Nationally Determined Contribution), which is made up of several appropriate action plans. This is to assist and support climate change's adverse effects and progress toward net-zero carbon emissions; not limited to putting in place management measures for protected areas adapting to climate change; improving early warning systems and spreading climate information; building and repairing flood protection barriers for agrarian and municipal development; expanding the usage of mobile pumping stations and permanent stations responding to mini-droughts and encouraging groundwater research as a

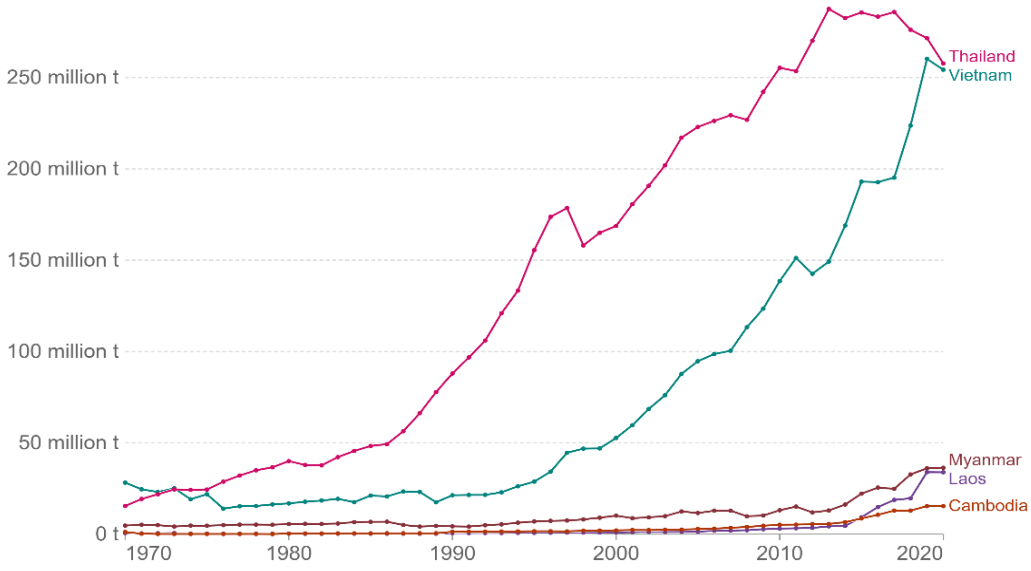
response to drought and climate risk, and developing climate-preferred agriculture (FAO/FAOLEX 2015).

Cambodia has strongly committed to reducing greenhouse gas emissions by sending its multi-sectoral policy document to the UNFCCC in 2021. Most countries have signed this new climate change agreement, which says they will cut their greenhouse gas emissions to keep global temperatures from rising more than two degrees. However, people do not consider these countries to break their promises but rather to keep improving. During a meeting with the Environment Minister, the EU, Swedish, and German ambassadors, it is worth noting that the EU ambassador to Cambodia gave Cambodia praise and support for its long-term goals to cut down on emissions (Khmer Times 2021). Figure 6a displays Cambodia's greenhouse gas emissions broken down by sector. In contrast, Figure 6b compares Cambodia's yearly CO_2e emissions to those of its surrounding nations, revealing that Cambodia's emissions are the lowest.



Source: CAIT Climate Data Explorer via Climate Watch, 2022

Fig. 6a Greenhouse gas emissions by sector, Cambodia, 2018



Source: Ritchie, H., 2022. Global Carbon Project

Fig. 6b Annual CO_2 emissions

Note: CO_2 emissions from burning fossil fuels for electricity and cement

Likewise, Prime Minister Hun Sen said that carbon credits are essential for long-term funding for activities that reduce greenhouse gas emissions. Cambodia is willing to work with other countries, and the private sector is interested in partnerships. Also, energy, climate, and environmental issues, especially climate change, continue to be significant problems for everyone and affect health, food security, socioeconomic infrastructure, and the ecosystem overall, primarily through natural disasters like floods and wildfires (Khmer Times 2021). Cambodia is a developing country, but the government is dedicated to making energy, climate, and environmental challenges long-term priorities. Cambodia has participated successfully in the voluntary carbon market and is preparing additional work under the Paris Climate Agreement.

1.9. How Cambodia deals with greenhouse gas emissions

In previous sections on waste management, pollution, and deforestation in Cambodia, it has already been established that these are the primary drivers of excessive GHG emissions into the atmosphere. Cambodia's natural resources include precious metals, bauxite, copper, iron ore, lead, tin, and other minerals. However, because of recent economic changes, mining and resource extraction companies are now permitted to operate freely in Cambodia. Since so many families depend on the least priced fossil fuels for domestic use, the rate at which households utilize fossil fuels like coal and wood continues to climb. In particular, most Cambodians dwell in rural areas and work as farmers, fishers, and livestock producers (Cambodia Ministry of Mines and Energy, 2016).

A plausible scenario for carbon neutrality by 2050: The Long-Term Strategy for Carbon Neutrality (LTS4CN) modeling suggests that Cambodia could be carbon neutral by 2050 if the forestry and other land use (FOLU) sector provided a total carbon sink of 50 megatons of carbon dioxide equivalent ($MtCO_2e$). The simulation done by the Long-Term Strategy for Carbon Neutrality (LTS4CN) predicts that Cambodia might be carbon neutral by the year 2050, provided the forestry and other land use (FOLU) sector generates a total carbon sink equal to 50 megatons of carbon dioxide by that year ($MtCO_2e$). The energy industry is projected to be the sector that produces the most pollution in the year 2050, with 28 $MtCO_2e$, followed by agriculture with 19 $MtCO_2e$. The waste and industrial processes and product use (IPPU) sectors are expected to emit a total of 1.6 and 1.2 metric tons of carbon dioxide equivalents, respectively (Table 2).

Table 2. LTS4CN and business as usual scenarios for GHG emissions by sector in 2050.

SECTOR	Business as usual, $MtCO_2e$	Emissions reduction in LTS4CN scenario, $MtCO_2e$	Emissions balance in LTS4CN scenario, $MtCO_2e$
Agriculture	34.9	-15.6	19.3
Energy	82.7	-54.3	28.2
Forestry & other land use (FOLU)	21.2	-71.4	(-50.2)
Industrial processes & product use	10.7	-9.1	1,6
Waste	6.5	-5.3	1.2
Total	156	155.6	0.3

Source: National Council for Sustainable Development, 2021 - Cambodia's long-term strategy for carbon neutrality

Note: The national forest definition is used in the FOLU sector, and soils have been factored into the calculations.

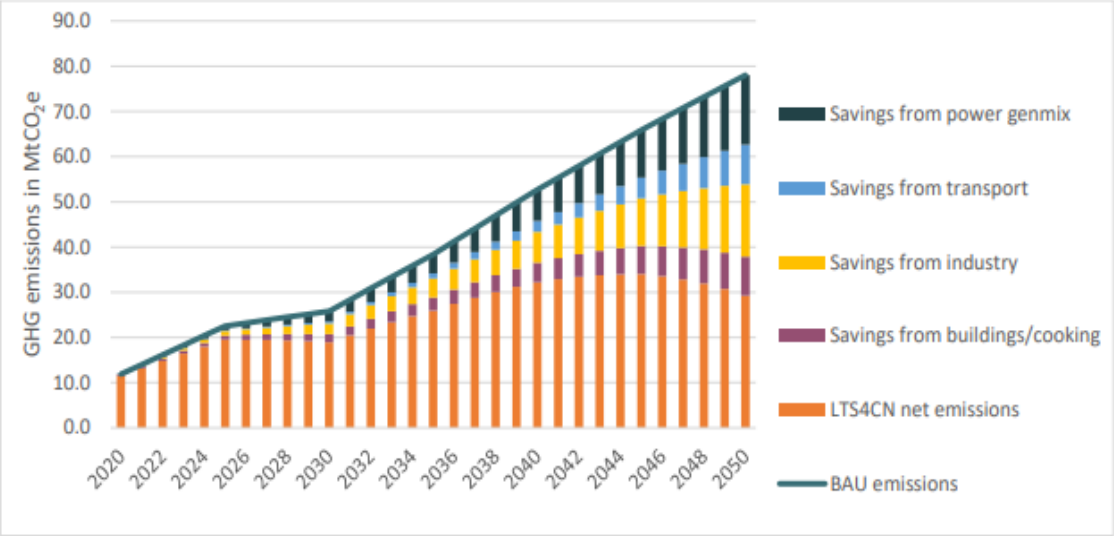
Cambodia's goal of being carbon neutral is based on FOLU pledges. Implementing REDD+ will reduce deforestation while increasing reforestation and restoration. Furthermore, FOLU should provide a substantial carbon sink, enabling other sectors to transition to carbon neutrality. REDD+ decreases deforestation and forest degradation emissions, promote forest management and conservation and increases carbon stock reserves.

The Ministry of Mines and Energy's national energy efficiency policy for 2021 to 2030 will minimize emissions in the energy industry via sustainable consumption. It will decrease energy usage despite the high demand. In addition, there will be incentives to switch to using electricity for cooking, automobiles, and carbon substitutes in industry. Metropolitan public transit will expand in the transportation sector, and the proportion of electric vehicles in the passenger car fleet will rise. After 2030, rail projects will begin to get funding. Emissions will also be reduced by the moderate usage of electric vehicles, the increased fuel efficiency of internal combustion engine vehicles, and the greater use of biogas (CNG) in cross-border trucks and buses.

By altering solid waste disposal in ten years, the waste industry will save 50% of its emissions. For instance, organic waste will be kept out of landfills, and landfill gas will be managed more effectively. Reduce the use of open fires and purify domestic wastewater. Biological waste treatment streamlining will lower emissions gradually but progressively. It will take 30 years to reduce the effects of climate change on agriculture. Reducing rice and livestock output, which uses a great deal

of methane, and boosting composting and biogas production will result in substantial reductions.

Overall, the LTS4CN scenario for Cambodia's energy sector might induce considerable reductions in emissions by progressively focusing on three main activities: (1) converting to low-carbon sources, (2) switching to more energy-efficient energy sources, and (3) decarbonizing the power generating process. Compared to the scenario that assumes business will continue, as usual, these forecasts that by the year 2050, the energy industry will produce just 28 MtCO2e (Figure 7), which is a decrease of 66%.



Source: National Council for Sustainable Development, 2021 - Cambodia's long-term strategy for carbon neutrality

Fig. 7 Energy sector forecasts for GHG emissions under the LTS4CN scenario

Conclusion

When referring to Cambodia as a "least developed country," phrases such as "greenwashing," "blue washing," and "green public relations" are used. It demonstrates that Cambodia's international position may not represent how seriously it is taking the fight against climate change. It is vital to investigate its national practices, policies, and mitigation activities to guarantee they are compatible. Cambodia, for instance, is a signatory to the UNFCCC, the Kyoto Protocol, the REDD+ Agreement, and the Paris Agreement. It does so while offering assistance in resolving climatic and environmental issues raised in Rio+20. In addition, Cambodia has to decide between alleviating poverty and building up its foreign reserve holdings by awarding land concessions to rubber, forestry, and mining enterprises.

Cambodia is one of the nations most vulnerable to climate change's effects, and it has only recently started taking steps to address the climatological challenges it faces. Even if there is an improvement in Cambodia's already weak climate triggers, the country will still be hit with more disastrous effects from climate change. There is no doubt that climate change is affecting Cambodia and the rest of the globe. However, there is a lack of coherence in Cambodia's depictions of the effects of climate change. For example, environmental practices such as landfills to manage rubbish, terrifying quantities of deforestation throughout the nation, greenhouse gas emissions from transportation, and burning fossil fuels for domestic use are delaying the day of doom. On the other hand, some of the data and information cannot be validated since they are written in Khmer or because they are not publicly available.

Cambodia is dedicated to mitigating climate change, like emerging and expanding nations. Institutional considerations have impeded attempts to combat climate change. Reforms need time to implement and enforce environmental and climate-related policies and goals. It is the case in China, Colombia, Peru, the United States, Canada, and South Africa. Environmental protection and economic development are incompatible. It serves the interests of several players, notwithstanding the destruction of natural capital. The need to enact actions and regulations that safeguard the environment is apparent, especially within the government and collaborators. No plan should be deemed impossible in this regard; on the contrary, even the smallest responsible action counts. In addition, the acute awareness of marketing via green PR provides an exaggerated value to something unsuitable. Therefore, we must learn to respect more modest and accessible techniques that address the project's inherent environmental, cultural, social, and economic circumstances.

List of Abbreviations

CCCSP – Cambodia Climate Change Strategic Plan
CCET – Centre for coordination on Environmental Technologies
CNG – Compressed Natural Gas
CSR – Corporate Social Responsibility
DCC – Department of Climate Change
EPI – Environmental Performance Index
ESG – Environmental, social, and [corporate] governance
FAO – Food and Agriculture Organization
FAO/FAOLEX – Food and Agriculture Organization/Food and Agriculture Legislation
FGD – Focus Group Discussions
FOLU – Forestry and other land use
GHG – Greenhouse Gases
GPR – Green Public Relations
GW – Greenwashing
RGC – Royal Government of Cambodia
REDD+ – Reducing Emissions from Deforestation and forest Degradation
IGES – Institute for Global Environmental Strategies
INDC – Cambodia's Intended Nationally Determined Contribution
IPCC — Intergovernmental Panel on Climate Change
IPPU – Industrial Processes and Product Use
LDC – Least Developed Countries
LTS4CN – Long-Term Strategy for Carbon Neutrality
MOP – Ministry of Planning
MRC – Mekong River Commission
MSW – Municipal Solid Waste
NCCC – National Climate Change Committee
NSDP – National Strategic Development Plan
PPCH – Phnom Penh Capital Hall
RS-IV – Rectangular Strategy Phase IV
SDG – Sustainable Growth Goals
SOG – Shades of Green
SWM – Solid Waste Management
UNEP – UN Environment Programme
UNFCCC – United Nations Framework Convention on Climate Change
UNGC – United Nations Global Compact
ZWN – Zero-Waste Nation

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