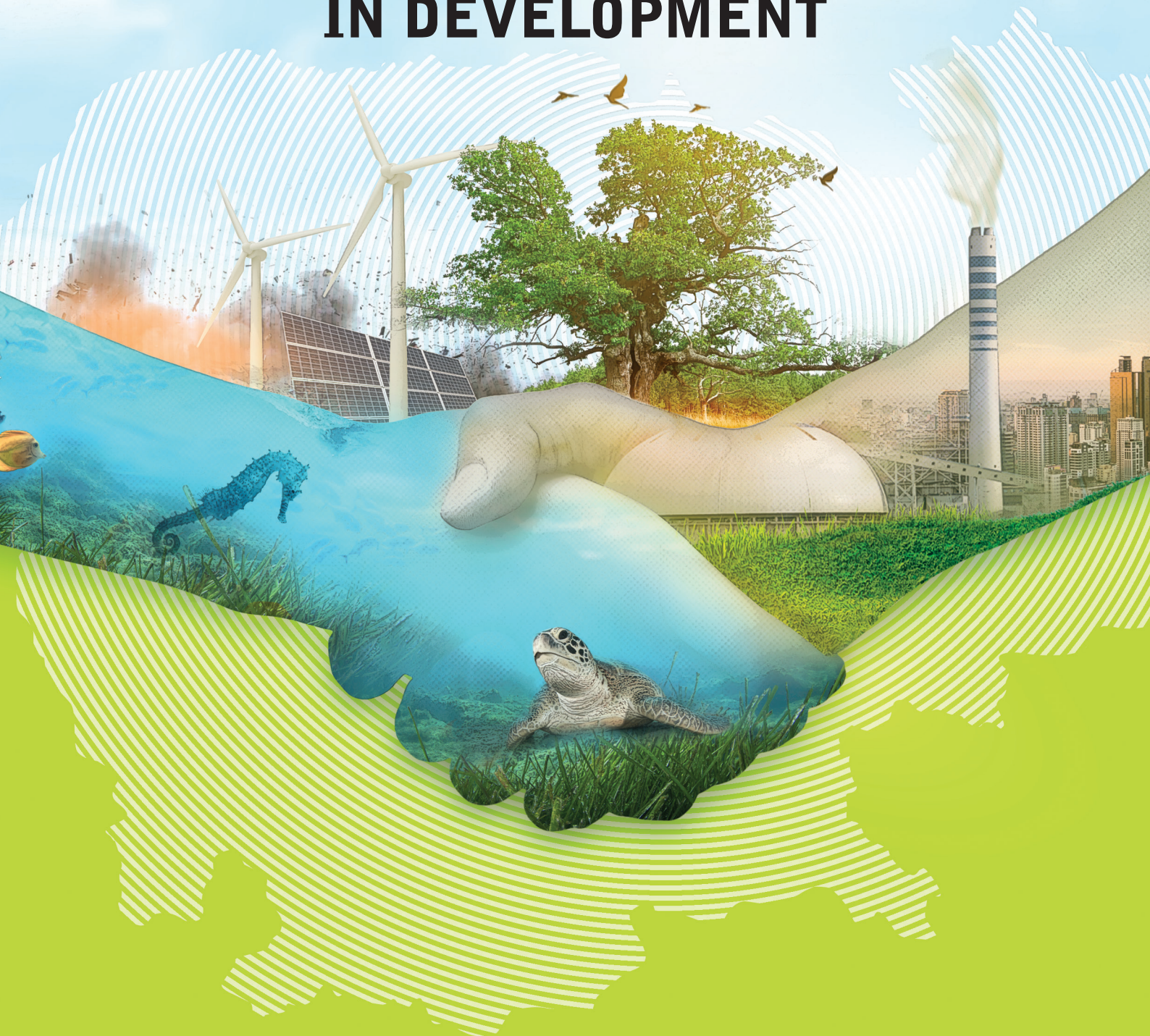


HEINRICH BÖLL STIFTUNG

PHNOM PENH

Cambodia

REFLECTIONS ON ENERGY AND ECOLOGY: COMMUNITY PARTICIPATION IN DEVELOPMENT



2023



REFLECTIONS ON ENERGY AND ECOLOGY:
**COMMUNITY PARTICIPATION
IN DEVELOPMENT**

2023

Heinrich Böll Stiftung

The Heinrich Böll Stiftung is a publicly funded institute with headquarters in Berlin and 33 international offices, we promote green ideas and projects in Germany, as well as in more than 60 countries worldwide. Our work in Asia concentrates on promoting civil society, democratic structures, social participation for all women and men, and global justice. Together with our partners, we work toward conflict prevention, peaceful dispute resolution, and search for solutions in the fight against environmental degradation and the depletion of global resources. To achieve these goals, we rely on disseminating knowledge, creating a deeper understanding between actors in Europe and Asia, and on a global dialogue as a prerequisite for constructive negotiations.

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We hope that the wide range of expertise, analysis and recommendation suggestions from the articles in this publication will provide a framework, knowledge and information for future discussions and dialogues on the issues raised and can also be used an education tool for young people, public and relevant stakeholders.

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Executive Summary

Cambodia is highly vulnerable to climate change and prone to natural disasters. In recent years, rising temperatures, increased rainfall, floods and droughts have become more common. Weak adaptive capacity, inadequate infrastructure, and limited institutions exacerbate the problems. Vulnerable communities in rural areas are disproportionately affected, grappling with limited resources and the lack of access to vital information in order to adapt to these changing conditions. The Cambodian government has acknowledged the importance of addressing climate change by ratifying the United Nations Framework Convention on Climate Change (UNFCCC) in 1995 and the Kyoto Protocol in 2002. Moreover, the Cambodia National Environment Strategy and Action Plan (2016–2023) emphasizes environmental protection and sustainable natural resource management as crucial components of socio-economic development.

The Heinrich Boell Foundation aims at empowering local civil society actors to contribute effectively to debates on policy priorities in the governance of natural resources. Our partners initiate research and capacity-building projects that inform and foster dialogue at local, national, and regional levels, focusing on environmental

and ecological issues. We particularly emphasize the situation of Cambodia's indigenous communities, whose social and cultural survival hinges on their access to traditional lands and natural resources.

With an established presence in the country, Globe has long had a standard and reputation on covering untold and underreported stories from across the region, working to place people at the center of their work. Social and environmental topics are often at the core of their reporting, as they strive to share stories that promote a more informed, inclusive and sustainable future for Cambodia and the world.

In our efforts to provide a comprehensive view of Cambodia's environmental challenges, this magazine comprises seven articles that address various topics in the field of environment and ecology.

Urban Poor Communities: Examining the risks faced by urban poor communities living around Phnom Penh, struggling against eviction due to land development, precarious land tenure, and inadequate amenities. These communities are disproportionately vulnerable to flooding and extreme temperatures, impacting their well-being and livelihoods.

Just Energy Transition (JET): Assessing Cambodia's



In our efforts to provide a comprehensive view of Cambodia's environmental challenges, this magazine comprises seven articles that address various topics in the field of environment and ecology.

progress in expanding access to electricity and transitioning to sustainable energy sources while highlighting challenges such as providing affordable and clean energy in rural areas and incorporating advanced clean energy technologies and innovation.

Trawling and Seagrass Meadows: Narrating the story of an individual dedicated to addressing the destructive effects of trawling on Cambodia's coastal communities. It introduces an innovative solution, a multi-functional artificial reef system, to mitigate the damage to seagrass meadows caused by trawling.

Environmental Impact Assessments: Stressing the importance of openness, accountability, and good governance in Cambodia's rapid economic development. It critically examines the implementation of these principles, particularly in environmental impact assessments.

Extractive Industry Impacts: Analyzing the ecological and social repercussions of Cambodia's extractive industry, including deforestation, pollution, and their effects on land, fisheries, and infrastructure that often do not benefit local communities.

Power Plants Developments: Spotlighting the role of energy production in Cambodia's economy and

the negative social, environmental, and economic consequences of coal power plants and hydropower dams, including worker safety and air pollution concerns.

Waste Management Challenges: Addressing the escalating waste problem in Cambodia, discussing the absence of a comprehensive waste collection and separation systems, as well as the negative ecological effects of waste disposal on landfills.

Development of Indigenous Community and Forest: Highlighting the perspective of Indigenous people in the context of deforestation in Cambodia. It demonstrates the negative impacts of alien developmental activities on the livelihoods and traditions of indigenous youth and communities.

These articles collectively underscore the daunting ecological and environmental challenges facing Cambodia. Nonetheless, our dedicated partners continue to champion approaches to environmental protection, promotion of indigenous land rights, and green energy. This magazine is also testament to their unwavering commitment to addressing these critical issues.

Aspiring to Inspire Cambodia's Marine Future

A young biologist explores the causes and suggests solutions to challenges that deplete oceanic ecosystems

By Tai Chen

Growing up in a family of fishers, I have been venturing out to sea long before I can remember. Some of my first memories include going fishing on our longtail boat, a traditional small-scale fishing boat. Catching fish was our way of creating an income to support the family.

I am from Treak Village in Srae Ambel district in Koh Kong province, on the southwest coast of Cambodia. My community has been fishing for generations whilst also maintaining rice fields and subsistence farming. I grew up with my father telling me stories about the incredible wonders of the sea and the variety of fish in the ocean, but also how fish catches had decreased considerably over time.

Twenty years ago, we would set out early in the morning and return at 3 p.m. having caught around 60 kilograms of fish. Selling this catch, we could make a decent living. However, the older I grew, each trip to the sea resulted in fewer fish. Around 10 years ago, we would spend an entire day and night at sea but it would still not bring us as big a catch. Eventually, in 2015, my family had to give up fishing. It just was not economically viable. We could barely pay for the fuel for our boat after selling the fish at the markets, even though the price of fish had increased.

I naturally wanted to learn more about this and what caused a downturn in fish numbers. In 2017, I graduated high school and decided to go to Phnom Penh where I studied fisheries science at the Royal University of Agriculture. I spent four years of my life learning about natural ecosystems, aquaculture, and conservation.

Whilst I enjoyed my studies, the course was tailored to freshwater fisheries, but I was always more interested in learning about marine ecosystems. I thus searched for a way to expand my knowledge of ocean life.

My classwork fortunately included lectures from the conservation department of the Fisheries Administration (FiA), which is where I was introduced to Phalla Leng,

who gave lectures as a marine biologist and sea turtle expert. My class was composed of 20 students; only six were interested in marine biology. We decided to organize a trip to visit Marine Conservation Cambodia (MCC) on our teacher's recommendation. This non-governmental organization was founded in 2008 to protect Cambodia's marine ecosystems and empower the communities that rely on them. It is now based and operates from Koh Ach Seh, an island in the Kep Archipelago in southern Cambodia, near the border with Vietnam.

Cambodian Coastal Communities Struggle with the Devastating Effects of Trawling

I first arrived on Koh Ach Seh island in 2021 and had my first exposure to why seas around Cambodia were suffering. While the Cambodian coastal communities have been heavily dependent on traditional fishing to earn money for a long time, much like my own family. But over time fishing has evolved and everyone is trying to make it more effective and profitable. Trawling was the next best method to get more fish in a shorter amount of time. It consists of a boat dragging large, cone-shaped nets that are weighed down by heavy metal chains dragging along the bottom of the sea floor.

Whilst trawling in offshore waters is allowed in Cambodia, trawling along inshore areas like the Kep Archipelago, where the maximum depth is around 10 meters, is illegal.¹ The reason trawling in shallow depths is not allowed is because of the massive destruction it causes to the ocean. The net, chains and guiding sleds drag across the seabed scraping up everything living and growing in its path. This so-called bottom-trawling is only practiced by a minority of fishermen but is indiscriminate because nothing can escape it and is therefore highly destructive. Most of the species trapped in these nets, such as seahorses, sea cucumbers, starfish, bivalves, and octopus end up as bycatch — ocean life

that is accidentally caught and is of no commercial use and discarded. These unfortunate creatures are usually dead when they reach the trawler and cannot be returned to the sea.

Fifteen years ago, the seagrass meadows spanning along the coast from Kep to Kampot were considered some of the largest in Southeast Asia.² However, increased trawling activity has been the main factor in the destruction of 70% of Cambodia's seagrass meadows.³ With each pull of the net, the chains and sleds tear through hectares of seagrass, crushing and destroying everything in their path. The casualties extend beyond the seagrass, wreaking havoc on bivalve beds and other marine habitats. What remains in the wake of this destruction is nothing but a barren desert of thick anaerobic mud devoid of life. Its consequences are catastrophic, reverberating both ecologically and economically.

Significance of Marine Habitats to Communities' Livelihoods

In the course of my studies, I learnt that seagrass meadows, bivalve beds, and coral reefs provide crucial nursery grounds and habitats for many species, including commercially important fish and shellfish. Additionally, they play a vital role in carbon storage and improving water quality by removing pollutants. They also contribute significantly to the oceans' nutrient cycle and act as a barrier against coastal erosion. Their presence helps to dissipate wave energy, reduce the impact on coastal areas and safeguard communities from potential destruction, such as flooding.⁴ As a result of illegal trawling practices and consequent loss of biodiversity, Cambodia has experienced a drastic decrease in marine resources that directly impacts the livelihood of local coastal fishing communities.

As a society, we care about what we can see. We are deeply concerned about the loss of terrestrial biodiversity. It saddens us to witness the devastating impact of burned-down and destroyed forests, which we often see depicted in news reports from around the world. These images evoke a sense of urgency and motivate us to take action to protect and conserve our valuable land-based ecosystems.

However, it might be even more important for us to also recognize the plight of marine life, even though it is invisible to the naked eye. The loss of these crucial habitats in the sea through the direct influence of human activities remains hidden under the seemingly untouched surface of the ocean.

Most of the species trapped in these nets, such as seahorses, sea cucumbers, star-fish, bivalves, and octopus end up as bycatch — ocean life that is accidentally caught and is of no commercial use and discarded



Oyster raft deployment in Praek Ampil, Kampot

Fisheries Production Structures: An Innovative Solution

While I began to better understand the causes of our loss of marine biodiversity, I was also introduced to some optimistic and inspiring solutions to mitigate the loss of marine ecosystems. In 2018, Marine Conservation Cambodia developed a multi-functional artificial reef system called the fisheries production structure.

The design is cost-effective, adaptable, and simple, thus easily replicable. It consists of 20 concrete blocks each weighing 100 kilograms and laid out as an octagonal, multilayered structure. These blocks are held together in the shape of a tower by thick ropes, allowing the structure to maintain its integrity even if it is caught in a trawling net⁵.

Each of these structures weighs between 2 and 2.5 tons, which makes them a very efficient deterrent against illegal fishing activities. Trawling nets get caught in the structure and hinder the boats from scraping the sea floor. Stopping illegal activities is a major benefit, but it is not the only purpose of the fisheries production structure. The structures also provide a habitat, shelter and secure spawning grounds for bivalves and fish, as well as a surface for corals and sponges to attach to. By becoming a reef for many filter feeders, it works like a natural filtration system, promoting better water quality and therefore cleaning the ocean environment.

MCC is working with Community Fisheries (CFi) to find the best spots to deploy these structures along Cambodia's coastline, deploying 350 of them in Kep

and Kampot provinces. Each fisheries production structure is manually built underwater by a team of four qualified scuba divers. They have also been strategically positioned along the Marine Fisheries Management Area (MFMA) around the Kep Archipelago. Within the MFMA, MCC has recorded new growth of seagrass species, as well as an increase in marine mammal activities.

Especially exciting is the return of the dugong to the area, a marine mammal closely resembling the more common manatees, whose scarce population was only recorded in interviews with local fishermen.

Can Oyster Farming Provide an Alternative Livelihood?

Considering my background, I have always been interested in how conservation efforts and a fishing community's livelihood can work together. How can fishers who are forced to give up their traditional profession make a living despite the destruction of habitats, overfishing, and use of harmful fishing methods?

After my first visit to Koh Ach Seh, I decided to come back to write my thesis on the potential for oyster farming and its impact on marine ecosystems. I interviewed fishers in Praek Ampil village in Kampot for a university project and decided to pursue the possibility of building a project with a focus on alternative livelihoods and restoration within MCC. Oysters are perfect for combining conservation and improvement of livelihoods due to their nature as filter-feeding bivalves, filtering

all nutrients needed to support their growth from the water and improving its quality⁶.

After presenting my idea of oyster farming as an alternative livelihood source, I was pleasantly surprised by the positive reactions I received. MCC, the government, and fishing families who could potentially benefit from the project, all showed great enthusiasm and support. It was truly heartwarming to witness their genuine interest in exploring new paths towards sustainable income generation. With the help of my team, we have recently deployed seven fixed bamboo raft structures in Praek Ampil village in Kampot. These rafts, measuring 6 by 6 meters, are equipped with at least 100 oyster strings. One string is 6 meters long and has 10 oyster shells attached to it, which promotes the attachment of oyster spat, which are what oyster larvae are called when they attach to a shell in the early development stages of the bivalve.

Today, one year later, I'm proud to say that my project has shown great potential. We have seen the first signs of success in spat attaching to the rafts, as well as an increase in marine life around the immediate area. The strong relationship I have formed with the communities and government has given me a great sense of hope for the future. By the end of 2023, we plan to hand over the rafts to the fishing community. I strongly believe that all of the volunteers involved in the project will share their acquired knowledge with the rest of the community and give a new impetus to generating local livelihoods. In the future, we'd like to expand the project to other coastal provinces with a natural occurrence of oyster growth. I am confident that we can make a meaningful difference, both environmentally and for the well-being of the community.

As someone who comes from a fishing family and has worked alongside multiple NGOs, I have witnessed firsthand the drastic changes occurring in Cambodia's seas. It is evident that conservation, with a mindful approach towards both humans and nature, holds the key to restoring biodiversity, safeguarding people's livelihoods and creating a sustainable relationship between mankind and the sea. This healthy balance is essential to avoiding the trade-off curse of having to choose between saving the environment and guaranteeing economic progress.

The urgency of this issue cannot be overstated — if we fail to take action now, the consequences will be dreadful. With unwavering dedication, I have committed myself to the preservation of Cambodia's marine ecosystems; hoping to inspire, teach and eventually be joined by the next generation of marine enthusiasts. ■



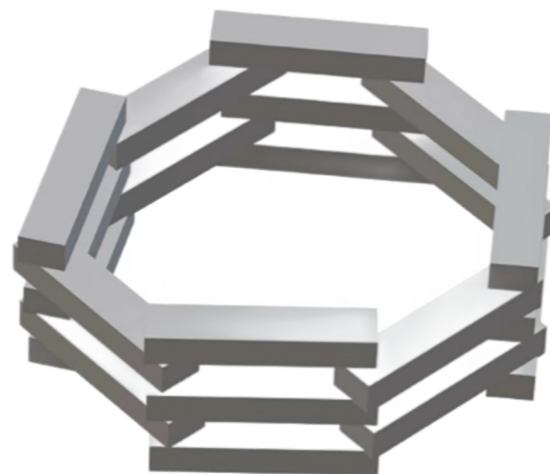
Tai Chen

Marine Conservation Cambodia (MCC)

Tai Chen is a marine biologist working with Marine Conservation Cambodia (MCC), an NGO located off Kep city on a small island. She is actively working to enhance the livelihood of Cambodian coastal communities and has created her own 'Oyster-Mariculture and Livelihood' project. Due to her strong relationships with government officials, as well as Community Fisheries (CFi), her work is widely respected. Furthermore, she is using her skills as a trained scuba and free diver and her years of experience in the field and involvement in other projects to teach underwater survey techniques to government officials, NGOs and local community members.

From the perspective of a young Cambodian woman, Chhen Tai describes her unique way of helping Cam

3D-modell of a Fisheries Production Structure (FPS) deployed by MCC
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Cautionary Tales From Stung Hav's Power Plants

In early October 2023, Vannchhai Rot visited Stung Hav to capture the perspective and document the story of how livelihoods of local people have been impacted following the opening of the coal-fired power plant in 2014

Words by Vannchhai Rot, Photos by Anton L. Delgado for *Southeast Asia Globe*

Energy production is a critical component of Cambodia's long-term energy and economic strategy. Since 2010, Cambodia's electricity demand has increased by about 20% per year, with 6% and 2% increases in 2020 and 2021 due to the Covid-19 pandemic. As a result, investment by Cambodian and foreign companies in the country's energy production has also risen sharply.

At the same time, Cambodia aims to meet the target of goal 7 of sustainable development goals of providing affordable and clean energy. While the current development of energy production in Cambodia using coal might be necessary to make the country energy self-sufficient, it also raises serious concerns about the undeniable negative social, environmental and economic impacts of coal power plants.

The government decided in 2021 not to issue new licenses for coal-powered plants but said that any plants approved prior to 2019 would proceed as planned. This was seen as the government's commitment to using sustainable energy sources.

Using publicly available environmental assessment impact reports and conversations with affected communities, this article explores the current development of coal power plants in Cambodia, as well as the experiences and feedback from local communities living around these plants to better understand how energy development should proceed in Cambodia.

Online & Offline Capacity

The first coal power plant in Cambodia was approved in 2011 and is called the Sihanoukville CIIDG power station. It is owned by CIIDG Erdos Hongjun Electric Power in partnership with the local company Cambodia

International Investment Development Group. The coal power plant is located in Preah Sihanouk's Stung Hav district, covers 116 hectares, and was operational in 2014 with a capacity of 405 MW.

CIIDG was granted another 700 MW coal power plant named Huadian Sihanoukville

Power Generation at the same location, this time in partnership with China Huadian Hong Kong Co Ltd. The plant started producing power in early 2023.



A shipment of coal is piled onto a dock in Sihanoukville's Stung Hav district, home to two of Cambodia's coal-fired power plant complexes

Sun sets on the coal loading docks in Stung Hav district as workers make their way home



A fisherman in Sihanoukville province passes the coal power plants on the coast of Stung Hav district



An Indo-Pacific humpback dolphin comes up for air by coal loading docks that supply two power plants in in Steung Hav district

The projects in Stung Hav are both operational and are supporting Cambodia's increasing electricity demands. Both companies have agreed to sell the produced electricity to state utility supplier Électricité du Cambodge for \$0.0743 per kilowatt hour (kWh) according to international news.

Two further coal power plants are being constructed in the country. The Botum Sakor Coal Power Plant is being developed in Koh Kong province by the Cambodian company Royal Group and will have a capacity of 700 MW. The second plant will be in Oddar Meanchey and have a capacity of 265 MW.

Local media has reported on concerns of Stung Hav residents and fishing communities on the potential impact of the coal power plant operations. This is also in light of the second project Huadian Sihanoukville Power Generation having no publicly accessible environmental impact assessment.

In 2011, a Stung Hav resident and representative of the fishing community said they were worried about the health of the community and the impacts on fishing activities in the sea adjacent to the first power plant. They were also concerned about air and marine pollution if the plant released toxic waste or untreated water from

the facility. At the time, the community asked for the construction of the coal power plant to be stopped.

According to the environmental impact assessment of CIIDG Erdos Hongjun Electric Power, which was conducted by Cambodian Environment Limited, various consultations were conducted with relevant stakeholders and especially with residents in Stung Hav. The assessment points to their concerns and specific response mechanisms to alleviate these concerns.

Livelihoods Changed

Following oral accounts from the fishing communities in Stung Hav, a great majority of the people in Stung Hav depend on income from fishing to support their families and livelihood. Small amounts of crocodile rearing and bird's nest farms also provide incomes for families in the district, with most residents trying as hard as possible to avoid the unfavorable choice of migrating overseas for jobs, the community said.

When the two projects were proposed to the community in Stung Hav, they were told it would bring infrastructure development to the area and cheap electricity. Residents said they were happy with the



Cambodia's active coal-fired power plants are concentrated in the district of Steung Hav in Sihanoukville province

current infrastructure development in Stung Hav, which includes concrete roads and other smaller ancillary roads that have replaced unpaved paths used by residents in the past. Once the coal power plants were operational, the price of electricity in Stung Hav decreased from \$0.25 per kWh to \$0.15 per kWh.

Both power plant projects promised job creation in the area. The environment assessment report of the CIIDG Erdos Hongjun Electric Power plant promised 1,500 jobs during the construction phase and 400 permanent jobs once the plant was online. Skilled workers were expected to get a salary of \$500 to \$1,500 for working in the power plant.

Community members said some people had given up fishing or their jobs as taxi drivers to work at the power plant. However, most residents were only offered unskilled work, with short-term contracts offering them salaries of \$180 to \$250 and only two rest days a month. The short-term contracts, often three months in duration, meant workers were not entitled to the benefits stipulated in Cambodia's labor laws for full-time employees.

Community members said workers were given jobs as security guards, kitchen staff, and cleaners, including

“ The smoke emanating from these chimneys is dense and black, often looking like monsoon clouds when seen from a distance

those who were meant to collect ash produced by the plant.

Those working in hazardous conditions were given N-95 respirators and high-visibility vests, instead of better protective suits as those given to full-time staff, many of whom were Chinese skilled workers. Unskilled workers were not sure if the equipment given to them would protect them against chemicals or ash, with one worker saying he experienced skin rashes when working on fixing piping at the plant.

Even though the power plant offered them some safety equipment, workers said they were still worried about the long-term health effects of working in the facility. The environment impact assessment report for the first plant states the company would set aside \$5,000 a year for 30 years as part of a health and public welfare



Fisherman Hang Dara stands by the bow of a fishing boat with a power plant in the background. He and others who make their living on the water believe coal activities have had a negative impact on the fish in waters around Steung Hav district



Cambodia's two active coal-fired power plants in Sihanoukville are visible across the bay of Kampong Som in Koh Kong, where Royal Group's stalled power plant project remains dormant

program and spend \$20,000 a year for 30 years on health checks for the 400 power plant staff.

In fact, according to both skilled and unskilled workers interviewed, they received health checks at clinics in Sihanoukville, but either did not trust the medical staff's assessments or were just prescribed Chinese traditional medicines and procedures for ailments. Workers were also in the dark about the extension of the National Social Security Fund to other sectors of the economy and had not received their registration cards as of publication.

As for CIIDG Erdos Hongjun's commitment to increase awareness in the community about air pollution, residents said they were unaware of any action on this promise. They have repeatedly asked local authorities for public forums to increase transparency on these issues and for relevant stakeholders to hear their concerns.

Environmental Concerns

The 405 MW coal power plant has three smoke chimneys, whereas the new 700 MW facility has just one big smoke chimney operating 24/7. The smoke emanating from these chimneys is dense and black, often looking like monsoon clouds when seen from a distance.

The company states in its environmental impact assessment report that the company has prevention measures to minimize pollution from the plant, and to ensure acceptable air quality standards are met in areas around the facility.

However, residents said that they believe air pollution from the plant's smokestacks has made them sick. They alleged having regular soreness in their throats and feeling sick. A 60-year-old former fisherman said he was recovering from some sort of sickness after getting medical treatment from a local doctor while another community member claimed that his whole family, especially his young daughter, had severe soreness in their throats weeks before the interviews.

Other community members said they found ash on the roofs and water tanks of their homes during the rainy season. People are still scared to use rainwater because it could be contaminated by chemicals released from the plants.

Little Recourse Moving Forward

Two former workers in the coal power plant said that they have been living in a constant sense of worry since the first coal power plant started operations in 2014.

They have been saving money to be able to move away from Stung Hav, largely over health concerns and their family's well-being.

Residents said there was little hope in advocating for any remedy in Stung Hav and the only option for them was to leave the area and their homes.

Following concerns raised by the community and people living around the coal power plant in Stung Hav, both the companies and relevant stakeholders should consider this feedback and implement the commitments made by CIIDG Erdos Hongjun Electric Power to promote awareness among local people about the coal power plants as well as its impact.

Scientific research by experts and regular public consultations would foster accountability, transparency and better decision-making around these kinds of projects. As Cambodia moves ahead with its energy development ambitions, it would be best for the government, private sector, and other stakeholders to ensure that economic development does not come at the cost of communities and the people it is meant to serve. ■



Vannchhai Rot

Cautionary Tales From Stung Hav's Power Plants

Program Coordinator of Heinrich Boell Stiftung

Climate Change and Environmental Governance in Urban Poor Communities

In Phnom Penh, inner-city neighborhoods feel the impact of increased heat and flooding

By Prak Sovanlyta and Chhai Bunsonareach

Sophoeun, a 62-year-old woman living in Phnom Penh's Pongro Senchey community, shares a common experience with millions of other Cambodians who are struggling to cope with the effects of climate change.

Sophoeun lives in a small, cramped home. She said her home was small and did not get any fresh air because the community entrance was blocked, preventing any natural ventilation and trapping heat in the area. As temperatures have increased over the years, her cost of living too has increased as her family spends more money on water and electricity: using electric fans to keep cool and taking more showers to deal with the heat.

Cambodia is one of the most disaster-prone countries in Southeast Asia, particularly from increased heat and flood hazards. Its low-lying plains and heavy reliance on agriculture make the country extremely vulnerable to the impacts of climate change. According to a European Commission study¹, Cambodia scored high on vulnerability and low on capacity to deal with climate-related disasters. And according to the 2020 Global Climate Risk Index, Cambodia ranks 12th in the world as one of the most vulnerable countries to climate change, posing a serious threat to communities and residents wellbeing.

Aggravating climate change in recent years has been extremely bad for the communities and the economy — especially the agricultural sector — affecting people's livelihoods and hindering economic growth. Even with the urgency around climate change and its destructive impacts, environmental governance in Cambodia is nascent and still developing.

But there is no time to waste. Urban poor communities, like the one Sophoeun lives in, need urgent policies and programs to specifically protect them from the impacts of climate change. Sopheun's difficulties in dealing

with climate change and its undeniable impacts on Cambodian communities is another reminder of the urgent need to address this crisis.

Bearing the Brunt: Urban Poor Communities on the Frontlines

A Phnom Penh Municipality annual report from 2012² defines urban poor communities as informal settlements erected on state public land. Urban poor communities can be found everywhere, often scattered around industrialized cities, as is the case in Phnom Penh.

Raksmey Samaki community, photo credited to Sahmakum Teang Tnaut



“Cambodia ranks 12th in the world as one of the most vulnerable countries to climate change, posing a serious threat to communities and residents' wellbeing”

Urban poor communities in Phnom Penh and other urban areas of the country already face an increasing threat of being evicted from their homes, as governments push for development of land within cities and towns. Residents lack official documentation for their homes, with little hope of the state giving them land tenure security.

Many community members in urban poor communities have lived in their communities for many years, some as early as the early 1980s after the fall of the Khmer Rouge regime. They are hesitant to leave because of the support networks and emotional ties they have to the only place they can call home.

On the flip side, urban poor communities often lack basic amenities, such as water, sanitation, and electricity, or even access to schools and healthcare facilities. So, even if they wanted to leave and move to a different part of the city, exorbitant land prices in urban areas and challenges in finding a new job are major deterrents.

When the authors of this article interviewed residents of the Raksmey Samaki, Pongro Senchey, and Prek Takong 3 it was immediately clear that these communities are more vulnerable to natural disasters, increased flooding and high temperatures, severely affecting residents' ability to do business or keep their families safe and healthy.

Most of the residents in these two communities

said they work as small traders at streetside shops or from their homes, others are in construction or were in government. But they were unequivocal about how they are ill equipped to handle the fallouts from environmental shocks.

“Our area seems to be lower than those surrounding us, which makes it very difficult for water not to flood our houses,” said a community member residing in the Prek Takong 3 community, who wished not to reveal his name. “We use money from our own pockets to rent pumping machines to pump out the water so that it doesn't completely flood our homes.”

A 55-year-old woman, who lives in the Pongro Senchey community, said:

“Nowadays, Cambodia has a lot of heat compared to before. And this problem is causing many difficulties, affecting our livelihood, such as our trading or daily work. Additionally, the heat makes the products we sell lose their quality.”

“When it rains heavily, we also face some problems, such as power outages and flooding. These make it especially difficult for us to travel for work daily,” she added.

A 42-year-old man, who lives in the Raksmey Samaki community, said all the community members are facing issues with increasing rain: “My community does not have a drainage system, and there is only one small canal that goes behind my house. This is why our houses get flooded when it rains,” he said.

“This causes even more problems for the children when they have to travel to school,” he added.

A Rising Tide Lifts All Boats

In 1992, a concept known as “Common But Differentiated Responsibility” emerged as one of the principles of the Rio Declaration on Environment and Development. The concept is centered on the idea that everyone has a shared obligation to address environmental destruction, but not everyone has the same level of responsibility to put in place these protections.

Likewise, in urban poor communities, different



Pong Ro Sen Chey community, photo credited to Sahmakum Teang Tnaut



Raksmei Samaki community, photo credited to Sahmakum Teang Tnaut



Pong Ro Sen Chey community, photo credited to Sahmakum Teang Tnaut

stakeholders experience the same effects of climate change, but not every stakeholder has the same responsibilities to mitigate these effects.

The Cambodian government and relevant agencies have the most responsibility for protecting both citizens and the environment. They need to provide all community members access to necessities, including clean water and sanitation, and at the same time invest in green infrastructure to reduce heat stress, improve air quality and mitigate effects of flooding. The government must also enforce environmental regulations strictly to ensure that every company, factory and polluting industry adheres to these regulations.

The government must work closely with community members and civil society organizations who have a more comprehensive understanding of the issues faced by urban poor residents. They are best placed to provide inputs for policies that best benefit the community.

Community representatives and members can identify environmental problems in their communities and bring them to the attention of the government and other stakeholders. They should be involved in policy formulation and also be an on-ground watchdog for the implementation of policies put forth by the government.

Civil society organizations should platform communities and their residents so they can be front and center in advocating for their rights and pushing for stronger environmental laws and regulations. They can also help research the environmental impacts of climate change on communities and develop targeted policy recommendations for the government.

The private sector and polluting industries have to reduce the devastating impact of their operations on the environment — there is no way around this. They can increase investment in clean technologies, pollution reduction measures, and environmentally sustainable



Pong Ro Sen Chey community, photo credited to Sahmakum Teang Tnaut

practices. And they must direct these initiatives at protecting urban poor communities, which will foster economic growth while also mitigating the damage from climate change.

Lessons from the Frontlines

The communities of Prek Takong 3, Pongro Senchey and Raksmei Samaki have shown remarkable initiative to alleviate the impacts of changing climate conditions, such as simple measures to mitigate higher temperatures and increased flooding.

According to the residents of Pongro Senchey and Raksmei Samaki, they have ensured community members are aware of the importance of staying hydrated during periods of hot weather. They encourage residents to drink as much water as possible to prevent dehydration. Additionally, they suggest people stay indoors and use fans during hot weather, as well as encourage the planting of plants and small trees in the community. Using these initiatives, people in both communities are trying to mitigate some of the negative effects of increased temperatures and protect themselves from heat-related illnesses.

According to residents of both communities, there is very little they can do about increased flooding and the time it takes for the rising waters to recede. “When the road is flooded like this, we cannot do anything. We can only wait for it to recede on its own,” said one resident.

Environmental governance in urban poor communities is complex and requires every stakeholder to participate. The government, community representatives and members, civil society organizations, and the private sector all have important roles to play in protecting the environment and the people’s quality of life as we are all living on the same planet. ■

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Climate Change and Environmental Governance in Urban Poor Communities

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Extraction But Not at the Cost of Communities

Cambodia is rich in environmental resources like oil, natural gas, gemstones, and minerals like bauxite and gold. These resources could play a significant role in the country's economic development. But the extractive industry had a modest or relatively limited impact in the country's development so far

By Roearn Sreyneang and Chea Lincheat

Using information on the current development of extractive industries and field visits to a gold mine in Preah Vihear province earlier this year, this article will explore the management of extractive industries, the ecological and social impacts of the sector using the lens of young people. The authors hope to raise awareness and bring more attention to the development of natural resource in Cambodia to encourage a more involved and informed citizenry.

Unearthing the Extractive Industry in Cambodia

In 2013, Cambodia established the Ministry of Mines and Energy (MME) to specifically manage and regulate the extractive industry and to attract sustainable investments, protect the environment, and distribute the benefits fairly among its citizens. Although the extractive industry can contribute to economic growth, job creation, and infrastructure development, it also poses serious environmental and social challenges.

The Cambodian government has been focusing on the extractive industries sector, which includes exploration

and mining activities, as a potential driver of economic development. After the Mineral Resource Management and Exploitation Law was passed in 2001, the government granted exploration and exploitation permits to both local and international companies.

Existing extractive industries being employed in Cambodia include limestone for cement, gold, sand from rivers, precious stones and gems, and oil and gas exploration licenses. The sector contributed around \$347 million to Cambodia's GDP in 2021, according to Open Development Cambodia. However, as of 2022, the sector accounts for only 0.3% of all approved FDI investment projects in the country, according to the World Bank.

Since 2016, Cambodia has granted 23 licenses, five of which are currently given to gold mining companies in five provinces. While gold extraction operations licenses are the most active in the country, especially the Okvau mine in Monduliri province, an oil extraction concession in the Gulf of Thailand has stopped production after the foreign company running the concession went insolvent. Other active extractive operations are limestone mining for cement, with quarrying occurring in Kampot and Kampong Speu provinces.



The discussion between local people and youth about problems and impacts



The burning gold minerals to be gold by community

Ecological and Social Impacts: Unraveling the Consequences

Extractive industries can have widespread effects on land use, deforestation, and pollution, and have been shown to exacerbate environmental damage and climate change, which is directly linked to human and industrial activity. In areas housing indigenous populations, it can impinge on cultural considerations like ancestral lands and fisheries. Also, infrastructure created for extractive industries does not always benefit communities around these projects.

One recurring issue has been encroachment on indigenous lands and water pollution that is killing livestock in Preah Vihear province, reportedly near a gold mining operation. The lack of consultation and feedback from local communities is a frequent issue raised by people living around mines and extraction areas.

Field trips and interviews with people living in areas near mines and extractive industries from March 2023 reveal that communities have very little public infrastructure and have poor livelihoods. The government has been working on solutions to address environmental pollution in these areas, such as runoff from industrial and mining activity, but it seems to be ineffective. The companies themselves are seemingly not addressing daily environmental issues faced by the people and appear to lack any measures to assist communities.

For an equitable distribution of revenue generated by the state, it is imperative that the government provide greater transparency regarding the yields from the extractive industry and the potential benefits for those who reside close to them.

Cambodians, especially younger citizens, are disappointed and saddened by the government's shortcomings in managing extractive industries. Questions are raised about government complicity in wrongdoings plaguing the mining and extractive sector in Cambodia, given that the government is intricately involved in assessing impact reports and the progress of these projects.

Mostly, the youth are concerned about the lack of transparency in the management of the sector, such as lack of access to environmental impact assessments, no clarity on revenue generated, and the potential for serious natural calamity from these industries. All the while, the government has prioritized revenues over environmental protections nor has it been able to equitably distribute revenues to benefit communities affected by extractive projects.

The government must ensure that state and natural

resources are used to ultimately improve the lives and livelihoods of communities and people it represents. The way to do this is to embrace open consultative processes that ensure extraction of the country's natural resources is consensus-oriented, involves community participation, and has built-in checks for accountability and transparency. Communities must work with non-governmental organizations and civil society groups to highlight the shortcomings of the government in relation to issues around transparency and the environmental impacts of extractive industries.

The extractive industry sector must share the benefits of the development they say they are bringing with surrounding and not just leave them to deal with the environmental costs and fallout. ■



Roearn Sreyneang

Extraction But Not at the Cost of Communities

Roearn Sreyneang studied Natural Resource Management and Development at the Royal University of Phnom Penh. Since 2010, she has volunteered with local and international organizations working on child welfare, human rights, democracy building and social justice, especially environmental issues and climate change.



Chea Lincheat

Extraction But Not at the Cost of Communities

Chea Lincheat is a Buddhist monk studying law at National University of Battambang. He has been a youth volunteer and trainer at local NGOs dealing with issues like human rights, democracy, and the extractive industry.

How Cambodia Tackles Its Waste: A Closer Look

As waste generation in the Kingdom increases at a significant rate, a comprehensive strategy to tackle the challenge is needed to ensure a sustainable future for the environment and local communities

By Marie Bahati Kaiser

Waste management poses a global challenge, especially in Asia where it is a major public health issue and the improper disposal of waste exacerbates existing environmental concerns.

In 2020, Cambodia generated 4.78 million tons of waste in urban areas, an average of 0.78 kg per capita per day, compared to the world average of 0.74 kg per capita per day. The generation of MSW per capita is expected to significantly increase to 2.13 kg by 2050. This increase can be attributed to rapid urbanization and rising national gross national product. Improvements in the standard of living in cities have led to lifestyle changes, such as increased consumption of single-use plastics, as well as economic growth from the tourism or construction industries have contributed to higher waste production.¹

This article takes a closer look at waste management in Cambodia.

It reviews the management of waste from collection to disposal and existing government regulations to manage this system, assesses the challenges and provides some suggestions on how to move forward. The focus of the article lies on the management of Municipal Solid Waste (MSW), including waste generated from households, services, or commercial activities, which do not contain toxic substances or hazardous waste.

From Generation To Disposal

Waste management comprises various phases: generation, storage, collection, transportation and final disposal. There are significant variations in this process between urban and rural areas.

In Cambodia, food and organic waste make up 55% of total waste, followed by plastic (10%), glass (8%), and metal waste (7%), as well as waste from paper, textiles, ceramics, or stone. Notably, food waste in Phnom Penh dropped from 87% in 1999 to under 50% in 2015, while

Improving waste management requires a comprehensive strategy that must cover several key areas

plastic waste increased from 6% to 21% during the same period. The amount of plastic waste in Phnom Penh is twice as high as the nationwide average. Residents in urban areas store their garbage in bins provided by housing management associations, and public bins, or simply place it on sidewalks. At local markets or commercial establishments in Phnom Penh, trash containers are provided.

In 2021, 204 cities and districts collected about 2.10 million tons of solid waste, an average collection rate of 72%. Phnom Penh has the highest collection rate at 92%.² The collection is mainly done by private companies commissioned by local authorities. Since 2019, three companies have handled waste collection in Phnom Penh: 800 Super-GAEA (Cambodia), Mizuda Sanitation Cambodia and Cintri Cambodia. Also, Cintri was tasked with collecting waste disposal fees which were included in a household's electricity bill, but the city has now taken over the collection of these fees.³

In rural areas, households are responsible for their waste management. The reason for this is that municipal and district authorities in these areas are reluctant to extend this service to people or are unable to provide basic waste management services due to a lack of resources, low environmental ethics, education, or support networks, and distance from landfill sites.⁴



Waste laying on the streets of Siem Reap.



A waste picker transports recyclable materials in Phnom Penh

Waste management in rural areas is outsourced to the local market administrators, the community or voluntary groups. This results in the burying, burning or illegal dumping of people's waste.

Approximately 54% of MSW nationwide is disposed of in landfills, recycled, composted, and incinerated, while the remaining 46% is disposed of in an uncontrolled manner. Recycling accounts for only 4% of total waste disposal and is limited to the informal sector. Waste pickers (around 3,000 in Cambodia) walk from home to home collecting recyclable materials and sell them to waste buyers or scrap stores (around 692), which then sell the trash to domestic recyclers or export the materials in large quantities.

However, this has decreased as more and more neighboring countries ban the import of waste. The recycling of waste in Cambodia is very limited due to a lack of infrastructure and market. Composting activities are no better: they account for only 2% of the total amount of MSW, although 50% of this waste is organic. Open burning is mostly used in rural areas and 57% of the total MSW is burned. Another 11% is buried and 5% of the waste is disposed of in rivers and the ocean. There are 54 small-scale incinerators installed in urban areas with limited access to waste collection and account for 4% of waste disposal.⁵

A Journey Through Waste Regulations

In 1996, the Law on Environmental Protection and Natural Resources Management assigned the Ministry of Environment (MoE) the responsibility for drafting regulations and supervising waste management.⁶

By 1999, sub-decree No. 36 on Solid Waste Management categorized solid waste into either household waste (MSW) or hazardous waste. Provincial and city authorities were made responsible for collecting, transporting, storing, recycling, reducing and disposing of waste in compliance with regulations approved by the Ministry of Environment. It also prohibits the import of all types of waste from other countries.⁷

In 2002, an exclusive 49-year contract was signed in Phnom Penh between the Phnom Penh Municipality (PPM) and the private company CINTRI, giving the operator primary responsibility for waste collection services across the city.⁸

Fast forward to 2008, the Ministry of Environment introduced a 3R (reduce, reuse, recycle) strategy for sustainable waste management, supported by the United Nations Environment Programme. The goal was to expand waste collection, promote waste separation for recycling, increase organic waste composting and improve landfills.⁹

In 2015, sub-decree No. 113 on Solid Waste Management delegated greater responsibility to municipalities and district authorities. This allows municipalities to engage private operators and grants them autonomy in allocating funds for waste collection. Waste producers (i.e., waste from households, services or commercial activities) are tasked with trash separation, and landfill measurement initiatives have been undertaken, although technical standards remain undefined.

In 2016, sub-decree No. 16 on Electrical and Electronic Equipment Waste Management was signed to prevent the disposal of e-waste in rivers or landfills by establishing penalties for individuals and businesses. In 2017, sub-decree No. 168 on the Management of Plastic Bags was enacted to encourage reusable or eco-friendly bag usage. These regulations are limited to the import, production, distribution and use of plastic bags that meet a specific criterion: a minimum threshold of 0.03 mm with a base width that is larger than 25 cm. During the same year, sub-decree No. 138 on the Management of Plastic Bags required supermarkets and shopping malls to charge customers 400 riels (about US\$ 0.10) per plastic bag.¹⁰

In 2018, the Phnom Penh Waste Management Strategy and Action Plan 2018-2035, a collaboration between the city of Phnom Penh and international experts, was created. The plan included specific action areas such as raising public awareness and promoting recycling, with precise timelines and budgets to establish the national policy framework for accelerating waste management implementation.¹¹

In 2019, the Ministry of Environment established a plastic task force to promote the 4R mechanism (refuse, reduce, reuse, and recycle) to address plastic waste more specifically. This includes better policy review, increased public communication and support for companies to adopt the circular economy concepts.

This spurred reform of waste collection in Phnom Penh in 2019. CINTRI, which has held the monopoly for waste collection in Phnom Penh since 2002, was going to be supported by two other companies. Additionally, the responsibility of collecting fees from residents has been transferred from the private operators back to the municipal administration.

In 2020, the Municipal Solid Waste Management 2020–2030 Policy implemented a new management system that took into consideration economic efficiency, financial resource capacity, environmental sustainability, and social acceptance of the 4R strategy.

In 2021, the ministry initiated a pilot project on battery waste collection and installed 74 battery waste

garbage cans at 68 sites in Phnom Penh and 11 other provinces. The ministry also established the National Committee for Municipal Solid Waste Management to develop policies related to the implementation of WTE (waste-to-energy), the development of environmentally friendly products and to increase citizens' awareness. Furthermore, Phnom Penh has established 13 new rules for waste disposal. It says that citizens should separate their waste into dry (white bags) and wet (black bags) waste. Furthermore, time schedules for trash collection were established.¹²

The Tricky Challenges

The high amount of waste in Cambodia and its management poses significant challenges.

It starts with the absence of waste separation among waste generators. Even with the implementation of 13 rules in Phnom Penh, which merely include separating household waste into wet and dry categories, separation does not happen.

Waste collection is also hampered by public-private partnerships in waste management. Collection services are mostly available in urban areas, while rural regions face limited coverage. Profit-oriented companies tend to operate in economically better-off areas that have the required infrastructure and financial means, leaving smaller cities and districts struggling to find private waste disposal providers.¹³ Only 17% of cities have integrated municipal solid waste (MSW) management into their development plans¹⁴. However, according to the local news, in Phnom Penh, the involvement of three companies and increased competition has led to improved waste collection.¹⁵

Lack of communication of waste disposal methods and the lack of standardization of these processes further complicate matters. Collection points, schedules and fees are not made clear or adequately communicated. Currently, due to a lack of collection points, garbage is picked up door-to-door, which is time-consuming and labor-intensive. Schedules and clear fees are not available for all neighborhoods. Citizens are often unaware of regulations, highlighting poor communication between the government and the public.¹⁶ According to one news article, many Phnom Penh residents said they never heard about the 13 rules, which was confirmed by the deputy director of the Cambodian Organization for Education and Waste Management.¹⁷

Transportation of waste introduces problems as well, with insufficient garbage trucks leading to a lack

of waste collection on streets. Furthermore, certain roads are inaccessible, especially in semi- and rural areas. The disposal of waste also represents significant challenges. Landfills are struggling to handle the ever-increasing volume of waste, and landfill management is unsustainable without proper control systems, soil cover, leachate treatment, and sanitation worker protection. The need for waste reduction and increased recycling is clear, but infrastructure and technology are lacking.

Overall, challenges persist in the distribution of responsibilities. First, there is a lack of clarity regarding the responsibilities of the various authorities. Who is responsible for trash collection is defined in sub-decree No. 113, but the responsibilities between city, district, and provincial authorities often overlap, leading to a lack of clear communication. Furthermore, compliance with sub-decrees related to waste collection and disposal must also be monitored for compliance.¹⁸

This selection of challenges underlines the need for comprehensive improvements in waste management practices in Cambodia.

Suggestions For Sustainable Waste Management

Improving waste management requires a comprehensive strategy that must cover several key areas.

To optimize waste management, information about collection points, collection times and fees should be revised and made more efficient. Residents must be clearly informed about this and waste separation rules must be implemented, including the use of marked bins at special locations to facilitate separation.

Furthermore, the loss of waste during transportation can be minimized by investing in advanced garbage trucks and compactors. To reduce plastic consumption, the plastic bag fee should be raised and extended to purchases at local markets.

However, low-cost alternatives must be promoted at the same time. A recycling infrastructure needs to be developed to reduce waste exports and to support and involve informal collectors and micro-enterprises here in Cambodia. In rural areas, small-scale biogas plants must be promoted to produce biogas and fertilizer from organic waste. Until sustainable recycling solutions deliver impact, the management of landfills needs to be improved by instituting higher technical standards.

Additionally, more research needs to be created using waste-to-energy technologies, such as waste-to-energy (WTE) or the conversion of waste into refuse-derived

fuel (RDF).

More generally, civic awareness needs to be increased. Nationwide education campaigns and the establishment of a hotline for waste management inquiries, can increase awareness among citizens. Last but not least, improving data collection and accessibility of this data is important to enable informed waste management decisions.

Implementing these recommendations can help achieve more sustainable and efficient waste management that benefits both the environment and the community. ■



Marie Bahati Kaiser

Cambodia Tackles Its Waste: A Closer Look

Marie Bahati Kaiser studied geography, and international organizations and crisis management. In her first thesis, she investigated the plastic waste behavior of the residents of the German capital Berlin. Since then, her interest in waste management has not waned and has continued to pursue the topic of waste management in Cambodia as an intern at HBS.



A Cambodian girl carries recycle materials at Stung Meanchey dump on the outskirts of Phnom Penh 22 October 2007. Photo: AFP PHOTO/TANG CHHIN SOTHY

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Indigenous rangers expand footprint in Cambodian forest besieged by illegal logging

In 2018, journalist Matt Blomberg visited an indigenous Kuy community fighting against a seemingly unturnable tide of deforestation on Cambodia's central plains. More than three years later, he returned with photographer Conor Wall to document a rare instance of indigenous people expanding their footprint in a world where ancient cultures are at threat of being washed away

Words by Matt Blomberg, Photos by Conor Wall for *Southeast Asia Globe*

At the edge of a shallow lake in Cambodia's central northern plains, three battered old men spend their days feeding chickens, weaving baskets, tending gardens, and wandering through the forest picking wild vegetables to cook in the evening, with little else to do before retiring each night.

The air is quiet and the pace of life is slow at this tiny settlement of huts built from luxury timber – like a retirement home for indigenous elders in the heart of the Beng Per Wildlife Sanctuary – but it hasn't always been this way.

Around the fire at night, the trio relives battles with “outsiders and thieves,” ambushes, threats, and warning shots – many of them fired here, at a clearance in the forest that logging gangs for years used as a base until this unlikely posse of vigilantes chased them away, reclaiming pillaged timber for the beginnings of a new settlement that their children might one day live in.

“This is my final destination,” Nhean Vorng, 77, said one morning, sitting on a stump beside his greenhouse, where dozens of saplings wait to be transplanted in a forest stripped of its high-value hardwood.

“If the forest is to survive, the youth must take over our work,” said the former headman in Bongarn Pol, a nearby community of Kuy people that has for generations collected food, medicine, and building materials from a stretch of Beng Per that they call Chom Penh.

“But the youth have been misled by outsiders. I fear it's already too late.”

Three years earlier, in mid-2018, Vorng packed two sets of clothes, a hammock, a spoon, and his tro – an ancient, two-stringed fiddle – into an old rice sack and

walked out of Bongarn Pol for the last time with three lifelong friends, sensing a tipping point in the battle to save the woodlands where the spirits of their ancestors roam.

The four men – aged 67 to 79 – walked half a day to the southern edge of Chom Penh, a 3,422-hectare dot at the heart of Beng Per, a 242,500-hectare lowland forest, where they drove timber into the ground, strung up hammocks, and began to dig a well.

They named the place Boeng Chhouk – or lotus lake – erected a sign forbidding entry to “outsiders” and held a ceremony, confirming their presence to the spirits of the sky, land, and water, and requesting safe passage as full-time keepers of the forest.

For at least a decade, the ecosystems of Beng Per have been under siege, with more than a third of forest cover and almost all old-growth hardwood trees lost to

“For at least a decade, the ecosystems of Beng Per have been under siege, with more than a third of forest cover and almost all old-growth hardwood trees lost to pillagers and plantations, as a precious way of life for those who have mastered living from the land slips away



An aerial view shows where forest has been cleared for a plantation, right up to the edge of Chom Penh

Mr Lims sits upon an old tree in Chom Penh



Mr Lim and Proum Chum patrol Chom Penh



Handmade sign marking the entry to Chom Penh

pillagers and plantations, as a precious way of life for those who have mastered living from the landslips away.

But at the heart of the so-called sanctuary, this unlikely posse of jungle guardians has drawn a line in the forest floor. And Ruos Lim, a wily 67-year-old who can be off a moving tractor, up a tree and back with a baby-sized jackfruit in less than 20 seconds, is calling the shots.

“I know how to protect the forest. I know the law. I know the strategies,” Mr. Lim said one afternoon, rattling off full names, nationalities, and credentials of people he had met years earlier at a global meeting of indigenous leaders in the Philippines.

“I started learning about indigenous rights in 2014,” he said, with, as always, a dash of Hollywood. “Before that, you didn’t need to know.”

For Mr. Lim, the tiny settlement at the southern edge of Chom Penh - self-sufficient but for lighters and salt, and the factory-made cigarettes and cheap, potent energy drinks delivered by well-wishers at random - is a symbol of victory.

In 2020, his community of 200 families and two dirt roads at the northern end of Chom Penh had its claims to the forest extended all the way south to Boeng Chhouk, almost doubling in size and, in theory, ending

years of disputes over the rights and responsibilities of companies, community, and rangers.

“Outside that area, is not our concern,” he said, steely-eyed. “We have vowed to protect Chom Penh: no more, no less.”

Turning the tide

The least conspicuous encounter was the most ominous.

On the last leg of an intense four-day mission in 2018, patrollers sat in a roofless hut passing around a bottle of homemade rice wine and tearing shreds from a sun-dried fish to eat with handfuls of rice leftover from the morning cook up.

Without a word, Mr. Lim stood up and left.

About 40 meters away, he stopped on the middle of a dirt track snaking into the forest, jammed the sharp end of his machete into the ground, leaned on the handle, took some wild tobacco from his pocket, and began rolling it into a leaf from the kakhom tree, better known for its luxury wood.

A tractor rumbled into sight, heading toward the forest. Mr. Lim lit his cigarette and stood directly in its path, all 50kg of him, staring down the driver,



Mr Lim feeds the chickens at Boeng Chhouk

who looked as strong and imposing as any farmer in outback Cambodia. A few meters short of Mr. Lim, the driver killed his engine and, clearly nervous, mumbled something about going to tend his crops.

Mr. Lim remained silent, slowly turning the cigarette between his lips as tension grew, glaring through wafts of smoke at the “intruder.” Without another word, the man churned his tractor back to life and reversed out of sight, back from where he had come.

Mr. Lim slung his scythe over his shoulder and let out a single round of his rusty old cackle, which wreaked of triumph, bravado, and, just maybe, a smidgen of relief. “If I see ten illegal loggers,” he told me later, “I catch 10 illegal loggers. This is a fact, and it is well known.”

Winding through sacred forest over the four days prior, Mr. Lim - a tracker and spy in the 1960s for the Khmer Rouge, when it was still a little-known jungle militia - pointed out mother trees scarred by chainsaws, piles of freshly cut timber and lonely stumps, the remnants of battles won and lost.

“This is the frontline,” he said near the site of his future settlement, a trace of menace in his eye. “If we find thieves here today, I’ll only be happy.”

Day and night, he took command in no less than a dozen clashes with loggers – some foiled while making

their escape, some caught in the act, others sent back before the roar of their chainsaws could shake the air.

The elders chased down looters and forced them to cut stolen trees into useful pieces, then took them to build shelters at Boeng Chhouk. They lectured, intimidated, and took supplies from their targets – always younger, bigger, stronger, and often armed with sharp-edged farm tools and homemade guns.

“Do you think I’m scared of them,” Mr. Lim said when asked how he had managed to stay safe all these years, discharging a short burst of the rusty cackle, this time a scoff of indignation.

“I’ve been to war – bullets flying above, bombs exploding below. These guys would get one shot,” he said, imitating the use of homemade muskets that are common in rural Cambodia, “and then are just standing there helpless until they reload.”

On an afternoon scout of Chom Penh’s eastern perimeter, the comedian of the group took note of a butchered tree that had fallen from across the border.

“That’s our wood now,” said Proum Chum, a skilled weaver and trapper, emptying a satchel of instant coffee into his mouth, no need for water. “It’s nice. Maybe we should build a five-star resort.”



Nhean Vorng cooks a field rat over the fire

A dangerous game

Chum spent his youth in a traveling theatre group, where he mastered three characters: the shaman, the guru and the doofus, traces of which bubble forth on monotonous treks. But in Cambodia, working to defend nature is no joke.

Two of the most active environmental groups - Mother Nature and the Prey Lang Community Network – are outlawed by the government and their members often facing arrest and imprisonment in cases labeled bogus by observers and rights groups, as does Ouch Leng, a Goldman Prize winner known for daring expeditions

“Kuy people used to be the custodians of the land, left to manage it among themselves using traditional boundaries without much oversight. The forest gave us everything – we had no need to steal from each other



Mr Lim smokes a bush cigarette



Proum Chum rigs up a snare to catch small mammals

into the heart of organized logging operations, which the government insists do not exist.

Indeed, the waters of right and wrong are perpetually muddied in Cambodia's forests, where business interests – domestic and foreign – are often backed by authority, putting them at odds with local communities with genuine claims to long-held land.

Chut Wutty became Cambodia's best-known environmental activist after leaving the military to campaign against its involvement in deforestation – and was shot dead by military police while escorting journalists into the southwestern Cardamom Mountains in 2012.

Six years later, three patrollers – a military police officer, a government ranger, and a staffer from a U.S. conservation group – were ambushed and murdered after confiscating chainsaws in the Keo Seima Wildlife Sanctuary in Cambodia's far east. The killers were Cambodian soldiers, allegedly protecting a logging cartel from across the border in Vietnam.

In Beng Per, where most of the high-value trees have already been pillaged, organised logging is no longer a problem for Mr. Lim and his men. These days, most run-ins are with other indigenous folks whose own forests have been decimated or destroyed.

“It wasn't so long ago that we lost our land,” said Hoklek Luon, a young indigenous community leader who studied law in Phnom Penh and often visits the Chom Penh elders. “Kuy people used to be the custodians of the land, left to manage it among themselves using traditional boundaries without much oversight. The forest gave us everything – we had no need to steal from each other.”

That began to change in 2012, he said, with the advent of “economic land concessions,” which saw more than half of Cambodia's arable land carved up for plantations, much of it inside designated protected areas, where companies had the right to clear-cut forest and feed a thriving international market for precious wood.

The scheme has been plagued by scandal, with some concessions used to launder timber looted from surrounding forests, and others stripped of their riches then abandoned.

“One company has been here for ten years, talking about a rubber plantation,” Hoklek said one afternoon, as the patrol reached a place they call L4, where the forest gives way to vast, open fields. “Until now, they have not planted a single rubber tree.”

Hoklek is a treasure and a rarity among indigenous youth, said the elders, who saw communities begin to fray when a new road was built from an arterial highway



Proum Chum swings lays in his hammock

through Beng Per in 2010, opening up a new world of influence and temptation.

“I noticed a difference in attitudes, personalities. It changed the identity of the community,” said Vorng, as gentle as a thousand grandfathers, explaining that young Kuy men could be swayed by beer, karaoke, and escorts to cut down their own forests. “The youth have lost touch with their culture,” he said.

Last year, Vorng's best friend – one of the four pioneers of Boeng Chhouk – died after having a stroke while on patrol near L4, which is named for its coordinates on a map used by the elders to formalise their claims over Chom Penh.

“Everyone dies,” Vorng said of his mate, who was the older brother of Chum, the joker. “There is no greater honor than to live for some cause.”

While their tiny settlement marks a rare instance of indigenous people expanding their footprint in a world where ancient cultures seem under constant threat, there is also a sense of mourning among the elders – and a feeling that Boeng Chhouk is their escape from a village where they would watch their way of life slowly corroded by time.

Vorng and Chum appear content to see out their days here, tending chickens and flowers while playing sentry at the seemingly defunct entrance to Chom Penh.

But as they hunch together at night over a smartphone gifted by Hoklek, squinting as they watch old Khmer music videos, Mr Lim remains alert, sitting alone in

his hammock, smoking bush cigarettes and staring off into the distance.

“The war here is won. This place is secure,” Mr Lim said of his mission to shore up the well-trodden path into Chom Penh. However, somewhat predictably, and with his trademark dash of Hollywood and cunning, he said it'd only be so long before he waded into a new battle. “The others can stay here if they want,” he said. “But soon I will move to L4 and start building a new camp there – even if I have to do it alone.” ■



Matt Blomberg

Indigenous rangers expand footprint in Cambodian forest besieged by illegal logging

Matt Blomberg is a multimedia journalist focused on environmental crimes, human trafficking, and gender issues in Southeast Asia.

Shaping Cambodia's Sustainable Future: A Just Energy Transition for All

Despite remaining challenges, Cambodia has made remarkable progress in its just energy transition paving the way for a low-carbon economy

By Sokphalkun Out

The concept of a “Just Energy Transition” (JET) has gained significant attention globally as countries strive to move towards more sustainable and equitable energy systems. Cambodia, a fast-developing nation, has made notable progress in recent years to expand access to electricity and shift to more sustainable energy sources. However, major challenges remain as the country works to ensure inclusive and just energy transition for all its citizen. This article examines the current state of JET in Cambodia, assess existing policies and practices, identifies areas where improvement is needed, and explores the critical role of Civil Society Organizations (CSOs) in driving a successful energy transition.

Landscape of Cambodia's JET and Practices

Cambodia has made remarkable progress in its just energy transition. With a clear focus on sustainability and energy access, the government has achieved significant milestones in recent years. For instance, as of 2022, over 98.5 percent of Cambodia's 14,000 villages have attained electricity access to power their homes, a vital step toward ensuring equitable energy distribution and sustainable development. This accomplishment showcases the country's commitment to energy access as a foundation for a just energy transition.

Cambodia's commitment to just energy transition is exemplified by its proactive renewable energy policies.



Solar panel in Bateay district, Kampong Cham province (credit to EGE Cambodia Energy Solutions Co., Ltd)

Under National Strategic Plan on Green Growth 2013 until 2023, government of Cambodia sets an ambition to drive country's pathway to incorporate resource efficiency, clean technology innovation along with community livelihood enhancement. The country has set out also its national energy policy consisting of the following four pillars presented by Ministry of Mines and Energy in 2019:

- To provide an adequate supply of energy throughout Cambodia at a reasonable and affordable price.
- To ensure a reliable and secured electricity supply which facilitates investment in Cambodia and development of the national economy.
- To encourage exploration of environmentally and socially acceptable development of energy resources needed to supply energy to all sectors of Cambodia's economy.
- To encourage the efficient use of energy and to minimize the detrimental environmental effects resulting from energy supply and consumption.

Through initiated existing policies and strategic plans, Cambodia will be able to attract investment in renewable energy projects. Clean energy sources like solar has emerged as significant contributors to Cambodia's renewable energy portfolio. The country's vast solar potential is being harnessed through large-scale solar farms, while wind energy projects have yet to gain traction in Cambodia.

The country has also shown its dedication to a low-carbon future by announcing its Long-Term Strategy for Carbon Neutrality policy. This ambitious strategy sets a target of achieving net-zero emissions by 2050 and emphasizes the decarbonization of key sectors, such as transportation, energy generation and agriculture. These developments demonstrate Cambodia's commitment to reducing its carbon footprint and embracing renewable energy sources.

Furthermore, Electricité du Cambodge a state-owned energy supplier, has established the Rural Electrification Fund to provide electricity access to rural and remote areas of Cambodia. The fund focuses on deploying renewable energy technologies, such as solar and micro-hydropower, to reduce reliance on traditional fossil fuel-based generators in rural areas. This initiative works towards bridging the energy access gap and improving living conditions in rural communities.

Various organizations in Cambodia have also been actively involved in promoting just energy transition and driving sustainable energy initiatives. Organizations such as Oxfam Cambodia, EnergyLab Cambodia and



Solar panel in Bateay district, Kampong Cham province (credit to EGE Cambodia Energy Solutions Co., Ltd)

“ Cambodia's commitment to just energy transition is exemplified by its proactive renewable energy policies

NGO Forum have played a crucial role in supporting for renewable energy adoption, promoting community engagement, and raising awareness about sustainable energy practices among youth and local communities.

Existing Gaps and Areas for Improvement

Despite significant progress, there remain gaps and areas that need further attention in Cambodia's just energy transition. One significant issue is access to affordable and clean energy in rural areas. While electricity access has improved, some remote communities still lack reliable and affordable energy sources. To ensure a truly equitable energy transition, policies must prioritize extending energy access to these underserved areas through decentralized renewable energy solutions.

Additionally, promoting the integration of advanced clean energy technologies and innovation into the energy sector is essential. Cambodia should invest in research and development to explore emerging technologies such as energy storage, smart grids, and demand-response systems. This way, the country can maximize the



The CMIC floating solar facility in Kampot. Photo from Globe Media Asia



Solar panel in Bateay district, Kampong Cham province (credit to EGE Cambodia Energy Solutions Co., Ltd)

potential of renewable energy sources and improve the stability and reliability of its energy systems.

Enhancing public awareness and understanding of the benefits of renewable energy is essential. Effective communication campaigns, educational initiatives, and community engagement programs can raise awareness among Cambodian citizens about the significance of transitioning to clean and sustainable energy sources. Public participation and involvement in decision-making processes regarding energy projects can further strengthen the legitimacy and inclusivity of the transition.

Last but not least, another area that requires attention is capacity building and technical expertise. Building skills and knowledge in renewable energy technologies can strengthen Cambodia's local workforce and contribute to a sustainable transition. Investing in education and training programs can empower individuals and communities to participate actively in

benefits of renewable energy sources. This outreach helps foster public support for JET initiatives and ensures that the transition is understood and accepted by all stakeholders.

Furthermore, CSOs can actively contribute to policy discussions, providing valuable input to improve existing frameworks and advocating for comprehensive and inclusive policies that address the needs of vulnerable communities. They can monitor the implementation of JET projects, ensuring transparency, accountability, and the equitable distribution of benefits. CSOs can also collaborate with the government and international partners to access funding, technical expertise, and knowledge sharing opportunities.

Making JET a Reality

Cambodia's pursuit of a just energy transition showcases its commitment to building a sustainable and equitable energy future. The country's progress in achieving energy access, implementing renewable energy policies, and reducing greenhouse gas emissions demonstrates its dedication to mitigating climate change impacts.

However, challenges such as an access to affordable and reliable sustainable energy sources, bridging the knowledge gap, enhanced public awareness, and skill development programs must be addressed through adjustments to policies and practices. With the active involvement of CSOs as key change agents, Cambodia can ensure a successful and inclusive transition to a low-carbon economy, benefiting both its citizens and the environment. ■

the energy transition, fostering local ownership and creating job opportunities.

The Role of Civil Society Organizations

Civil Society Organizations (CSOs) play a vital role in facilitating the successful implementation of a just energy transition in Cambodia. CSOs act as catalysts for change by advocating for inclusive and equitable energy policies. They engage with local communities, ensuring their voices are heard and their needs are considered in decision-making processes. CSOs act as intermediaries, bridging the gap between the government, private sector, and citizens, facilitating dialogue and collaboration.

CSOs' involvement in raising awareness and education on JET is also crucial. They can organize workshops, campaigns, and community-driven programs to educate the public on the importance of sustainable energy practices, energy efficiency, and the



Sokphalkun Out
Just Energy Transition (JET)

Sokphalkun has worked with various stakeholders in the clean energy sector, engaging with development partners, CSOs, and youth. Background in engineering studies with experiences in the sector for 3 years.

Transparency as the key: Nurturing environmental and social consciousness in Cambodia's development

Transparency is a crucial guiding principle in Cambodia's rapid economic development, emphasizing openness, accountability, and good governance to ensure responsible resource management and minimize potential risks and negative outcomes. Impact assessment is significant when uncertainty surrounds the impacts needed to decide whether a project should proceed. While there have been improvements in environmental impact assessment (EIA), ongoing monitoring and enhancement of transparency in EIA processes are essential

By KOEM Chhuonvuoch

Cambodia is rich in natural resources such as forests, water resources, minerals, and arable land. These resources are critical to economic development. Cambodia's economy has experienced rapid economic growth over the last decade, especially during the boom years between 2004 and 2008 as a result of interventions by international financial institutions (IFIs).

Cambodia also passed a new Law on Investment in the Kingdom of Cambodia in October 2021, with the goal of creating an open, transparent, predictable, and favorable legal environment to attract and promote domestic and foreign investment. Many development projects have been announced in each sector.

With an increase in development and investment, the potential consequences on the country's natural environment, biodiversity, and climate cannot be overlooked as the country strives for economic growth and higher living standards. In this situation, transparency is critical in all development projects and is a pillar of good governance and plays a critical role in protecting the environment and natural resources.

Unlocking Success: The Vital Role of Transparency

Transparency is essential in Cambodia, especially where rapid economic development is taking place. It is a guiding principle ensuring openness, accountability and good governance throughout a project's lifecycle. Transparency in a project promotes responsible resource

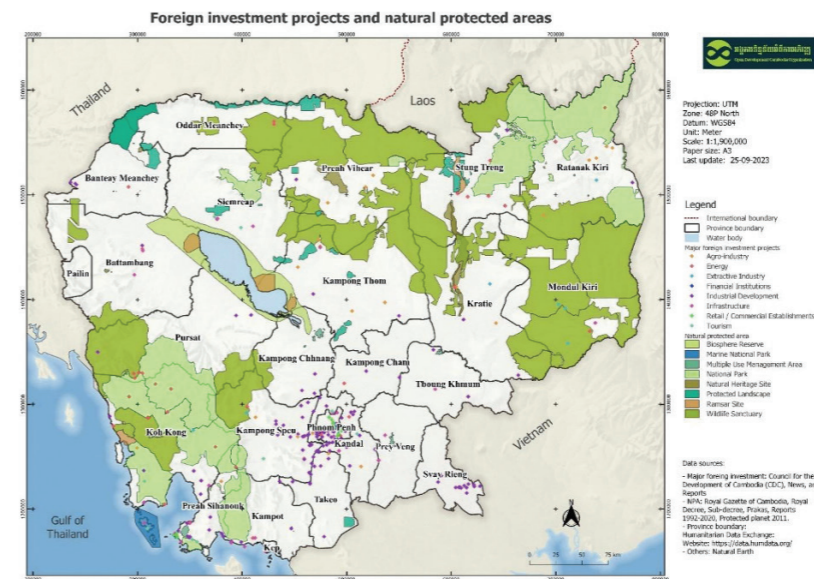
management and helps to mitigate potential risks and negative consequences. When there is transparency, significant outcomes will be generated including:

Accountability: Transparency will ensure project owners are accountable for their actions which are proven by open and transparent data. It is also easier to recognize responsibility and enforce environmental regulations when decision-making processes, project details, and EIA reports are open to the public.

Public participation: Social and environmental protection requires an informed and engaged public. It allows the public to fully participate in decision-making processes, express concerns, and provide valuable feedback on EIA. Vulnerable groups should be included in the process at all degrees of participation - notification, prior consultation, and agreement.

Trust building: "Without facts, you can't have truth. Without truth, you can't have trust. Without trust, we have no shared reality, no democracy, and it becomes impossible to deal with our world's existential problems," said Maria Ressa, a Nobel Peace Prize laureate. That powerful quote by Maria Ressa amplifies the importance of transparency in trust building how it fosters trust among stakeholders. When information is easily accessible, it lessens suspicions of corruption and boosts collaboration for long-term development.

Data accessibility: Transparency ensures that development projects and their environmental and social impacts assessment (ESIA) data are available. Ease of access to these documents benefits evidence-



Map on foreign investment projects and natural protected areas in Cambodia. Map by ODC. Under license CC BY-SA 4.0

Transparency is essential in Cambodia, especially where rapid economic development is taking place

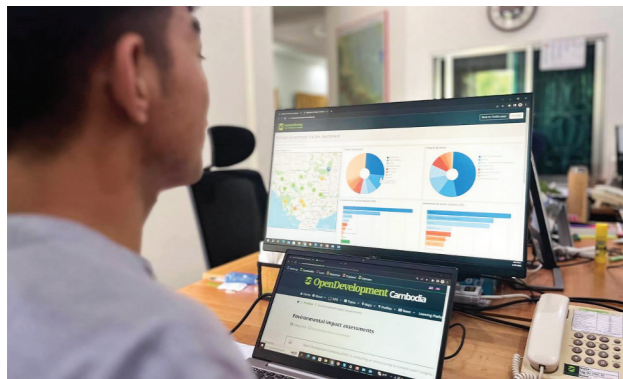
based decision-making and scientific research, helping researchers to produce scientific knowledge or findings with fairness and credibility.

Imperative for Environmental Impact Assessment

Article 59 of Cambodia's Constitution, the government shall protect the environment and the balance of abundant natural resources, and develop a detailed plan for natural resource management. In 1999, Sub-decree no. 72 on the EIA Process was adopted following the Law on Environmental Protection and Natural Resource Management in 1996, which requires an EIA for development projects. To make it clearer, Prakas no. 021 on Classification of EIA for Development Project was adopted in 2020. To enhance the proactive approach, the government recently adopted the Environment and Natural Resources Code which also mentioned strategic environmental assessment (SEA), an advanced tool that is conducted before all major decision-making and for evaluating the consequences of specific development plans, programs, and policies in a more focused and strategic manner.

Many projects have been implemented to aid the country's development, but their direct and indirect negative effects on both socioeconomic and environmental factors have sometimes gone unnoticed. The need for impact assessment will be highest where uncertainty affects the required management plan to follow up and decide whether the project should be implemented. EIA and environmental management plans (EMP) are frequently regarded as planning tools that are widely acknowledged as critical components of decision-making. EMP defines how an activity may affect the natural environment, and regulates that the person who is responsible for the action shall promise to prevent, limit, and manage such consequences, if happening, in an ecologically acceptable manner.

EIA is a complex, lengthy study or assessment involving various local and national stakeholders. Its principle is to manage the information collected about each project and the environmental impacts. During the EIA process, information about the adverse effects of each project is gathered to identify the most suitable solutions and alternatives to deal with any negative effects. Consultancy firms – registered with the government – are usually responsible for the reports. All consultancy firms must register with the government to ensure the quality of the report. There will be, therefore, someone to take responsibility if anything is wrong with the results. Nonetheless, there have been concerns about the accuracy and completeness of evaluations, with questions raised about these reports. Consulting



EIA profile page on the ODC Website. Photo by ODC. Under license CC BY-SA 4.0

firms can face legal consequences and fines, and some members, in a worst-case scenario, can be imprisoned if the corresponding ministry identifies fraudulent practices.

EIA in Cambodia: A retrospective

An effective EIA requires a solid and clear legal framework, consistent and responsive procedure, meaningful public engagement which is geared toward problem-solving and decision-making, and compliance. According to a study on “Critical challenges to consultants in pursuing quality of ESIA in Cambodia” in 2015, the overall quality of the information in EIA reports in Cambodia was 69% satisfactory. EIA proponents and consultants face a number of pressures, some of which could help improve the quality, such as pressure from regulators to produce high-quality reports, pressure from the public and community to ensure sustainable development, media attention, internal pressure from senior management, and pressure from international funding agencies, and others.

Legislative roles for consultants, political influence by the elite, limited time and access to baseline data for assessments, limited consultants’ expertise, financial constraints, and proponents’ lack of regard for or trust in consultants are all major roadblocks for consultants pursuing a good quality EIA in Cambodia. This could be interpreted as a lack of political will in politics to change for best practices. Despite progress since its inception in 1996, EIA practice and stakeholder roles continue to be uneven, resulting in assessment reports with significant gaps in key data.

Relying upon the five principles of EIA, a recent study illustrated that Cambodia is one of the countries listed as the medium EIA quality with a score of 46%, based on the World Bank’s categories. The availability of reports,

however, is not made public. Communities have limited access to information about vital development projects disturbing their communities, which can have serious consequences on their livelihoods. It is not common for authorities at all levels to share EIA reports with the communities affected by these projects, which frequently results in inadequate compensation. Several reports are found on the Open Development Cambodia (ODC), which is very few compared to all approved EIA reports.

There are few in-country specialists with experience in EIA reporting, so international consulting firms are frequently hired, leading to an increase in operation cost and a stagnated capacity building for local EIA specialists. EIA is used in decision-making, but there is a lack of transparency in the way that stakeholders, especially rights holders, are often uninformed or vaguely informed about the reason for the decision, an explanation of how it influences the decision, and a decision that is postponed until the report is completed. Still, the report does not meet the sustainable development approach criteria.

EIA Criteria score and compatibility in Cambodia

Furthermore, transparency in decision-making via an open data and facilitative system is essential for a successful process and monitoring. The procedures have been observed to be shifting towards a more open and inclusive environment. However, improvements in decision-making, approaches to sustainable development, and administrative support are still required. ■



KOEM Chhuonvuoch
 Transparency as the key: Nurturing environmental and social consciousness in Cambodia's development
 Natural Resources and Land Editor-Researcher/Project Coordinator at Open Development Cambodia (ODC)

Criteria	Sub-criteria	Yes	No	Partial
Legislation	Clear legal provision for EIA	x		
	Legal provision for SEA	x		
	Link with other regulation	x		
	Public participation	x		
	Time-frame	x		
	Transboundary EIA		x	
Administration	Detailed EIA guidelines	x		
	Available reports			x
	Review body	x		
	Specify sectoral authorities	x		
Procedure	Screening	x		
	Scoping	x		
	Alternatives analysis		x	
	Qualification of consultant		x	
	EIA content	x		
	Public participation	x		
	Comply with public participation results	x		
	Specify mitigation and monitoring			x
	Specify compliance	x		
	Follow-up process	x		
Specify auditing	x			
Decision Making	Decision making	x		
	Transparency of decision-making		x	
	The reason for the decision published		x	
	Explanation of how EIA influences decision		x	
	Decision postpone until EIA report		x	
Sustainable approaches	Ecosystem goods and services		x	
	Land use and land cover change		x	
	Biodiversity		x	
	Health and livelihood		x	
	Resource efficiency		x	
Administrative support	Adequate resources for EIA		x	
	Capacity		x	
	Private consulting			x
	Training and capacity building		x	
	Across-government support			x

Source: Thiri Shwesin Aung, Thomas B. Fischer, and Luan Shengji

By the Border: In the name of sustainability, Cambodia risks 'final frontier' for biodiversity

Plans for hydropower dams in Virachey National Park progress in private as conservationists argue this can't be 'clean' energy if the forest is felled and researchers look to carbon credits to leverage the landscape

Words and photos by Anton L. Delgado

As monsoonal rains rusted the charred skeleton of a logging truck, vines wrapped around the blackened vehicle seemed to drag it deeper into the wilderness.

Not far from the truck down an old logging trail, rangers in Cambodia's Virachey National Park conducted a biodiversity survey within the protected area, much of which is unexplored. The dense forest is one of the last relatively untouched landscapes in the fast-developing Mekong region.

"Logging and poaching is an issue but the park has a way of protecting itself," said Thon Soukhoun, who has been a ranger since the forest became a national park in 1993. "Nowhere in the country is like Virachey, it is

Cambodia's gem."

Nestled in the Kingdom's northeastern corner on the borders of Laos and Vietnam, Virachey was among the first Cambodian forests declared a protected area 30 years ago. At more than 3,300 square kilometres – nearly five times the size of the capital, Phnom Penh – it was the largest national park in the country at the time.

But as Southeast Asia races to cut reliance on fossil fuels, partly through climate finance schemes, Cambodia is risking this regional biodiversity hot spot for renewable energy.

Confidential documents and maps leaked to *Southeast Asia Globe* from meetings between developers and government officials this year indicate at least two

The cloudscape of the Veal Thom grasslands in Virachey National Park cushions the peaks that lead into the Annamite Mountains

hydropower projects within the park are underway. These files show initial assessment work has begun at the dam sites in the core of Virachey, which is also a heartland for the indigenous communities along Cambodia's borders.

To counter the thirst for development, researchers are monetising the national park in a different way by putting a dollar sign on Virachey's value as a potential carbon credit project. This in an attempt to prove the protected area may be worth more standing than if felled.

The stakes of this trade-off are high. Dam construction will threaten endangered species by altering river flow and clear-cutting old-growth trees, according to environmentalists. The same leaked papers also indicate

one of the dams will create a 215-hectare reservoir, flooding that section of forest.

Conservationists also fear hydropower dams in Virachey may jeopardise hundreds of thousands of dollars' worth of conservation funding from the U.K. for the sake of "clean" energy, the very definition of which they challenge.

"To build a dam within this valuable area within the national park, you would have to create access roads, cut down trees and disturb wildlife," said Pablo Sinovas, country director for the international conservation nonprofit Fauna & Flora. "I would not call any energy coming out of that 'clean'."

In the three decades since Virachey was made a



Thon Soukhon, who has been a ranger in Virachey since the forest became one of Cambodia's first national parks in 1993, leads a patrol within the protected area. He calls it "Cambodia's gem"

national park, Cambodia has lost more than 30% of its forest cover. Protected areas, often only safeguarded on paper, have been deeply affected by this large-scale logging.

While Virachey hasn't gone unscathed, the park's ruggedness protected it from the brunt of this deforestation. The forest is now known by Sinovas and other wildlife experts as a "final frontier" for biodiversity in the Mekong region, due largely to its transboundary habitat for animals migrating across the triple border.

As development discussions continue behind closed doors, Chou Phanith, an associate professor at the Royal University of Phnom Penh specialised in environmental economics, is calculating how many tonnes of carbon dioxide Virachey can absorb and potentially sell as carbon credits.

In Phanith's words, "money talks".

If the forest is monetised before dam construction breaks ground, it could lead to a debate about whether or not Virachey is worth more standing than if toppled for hydropower, Phanith said. He pointed out the dams are being proposed in one of the areas with the highest

potential for carbon storage.

"If forest ecosystems do not have any economic value, policymakers and the private sector will always regard forest ecosystems as less important than development," Phanith said. "We calculate the economic value of a functioning forest ecosystem as part of a win-win strategy, where we don't always block development but force sustainable and responsible development."

Doubling down on dams

The dam proposals in Virachey aren't entirely new. The first published document on energy production in the park dates back to a 2009 master plan for hydropower development in Cambodia, backed by the state-run Japan International Cooperation Agency (JICA). Miyoshi Asagi, counsellor for the Japanese embassy in Cambodia, said JICA's involvement with these dam developments ended when the masterplan was published.

In August, JICA announced it is developing a new road map to clean energy for Cambodia. Asagi said she is "aware hydropower plants have lots of debate" and that "there are no projects in the pipeline for hydropower."

An October report by WWF, released before the

“ The Mekong is reeling from compounding hydropower pressures, with additional dam developments threatening to further choke off the once-mighty river

World Hydropower Congress this month, found that the ecological toll of dams in the Lower Mekong Basin outweighed the rewards of renewable energy.

The report stated "as hydropower development grows, the cascading nature of its impacts could be wider and more significant than understood today."

The potential dams in Virachey are located on and named after the Prek Liang River. This waterway is a tributary to the Sesan River, which is part of Cambodia's "3S River Basin", itself a major tributary to the Mekong River.

The Mekong is reeling from compounding hydropower pressures, with additional dam developments threatening to further choke off the once-mighty river.

In Cambodia, documents often required for these types of developments, such as environmental and social impact assessments, are not publicly accessible.



Map: Anton L. Delgado • Source: Protected Planet • Created with Datawrapper

While officials from both the ministries of environment, as well as mines and energy, did not respond to multiple requests for comment, Minister of Environment Sophalleth Eang attended the Cambodia Climate Change Summit in November.

During a question and answer session at the summit, Eang responded to *Globe's* inquiry about energy plans in national parks, such as Virachey, by broadly talking about balance and the need to address developments in a "scientific matter". He then said national security through energy security is a priority.

Eang continued that the ministry "not do things because we feel like doing it", he said that environmental studies and impact assessments are done "properly... before we decide to do all of this."

When asked if these documents will be made accessible, he said: "When the public is receptive enough to accept it, to read, to think and to see what we are trying to achieve, yes."

The leaked files reviewed by *Globe* indicate

an opaque web of involved developers.

The documents, which span several years, note four potential companies that were at some point involved in the hydropower plans for Virachey.

Three are international developers – KTC Company,

An armed Ministry of Environment ranger Phang Phorng crosses a fast-flowing river in Virachey National Park, as community forest rangers carry across a jungle-rigged Honda Dream



Kyung An Cable and Korean South-East Power – while the fourth is a Phnom Penh-based electrical equipment supplier called Rich-Grid Technologies. None replied to requests for comment and it is unclear which, if any, are now leading development.

“These are very sensitive documents,” said Bunleap Leang, director of the local environmental organisation, 3S Rivers Protection Network (3SPN). He said that involved groups prefer to keep potentially controversial plans under wraps. “If the dam is good from the perspective of the government and the developer then, to them, no one else needs to know.”

Plans may be further along than simple discussions. Bunleap said he confirmed through the 3SPN network that hiring at Tabok village, near one of the proposed dam sites, has already begun.

High cost of clean energy

Virachey tumbles from Cambodia’s lowlands up into the biodiversity hotspot that is the Annamite Mountains, explained the conservationist Sinovas, comparing it to “two worlds converging in the park.”

At the time the sites were studied for potential hydropower, little to nothing was known about the

effect these developments would have on biodiversity and forest health, Sinovas noted. But that’s changed in the 15 years since.

“As we started to understand more and more about what was in the park we are realizing its conservation is critical for Cambodian and regional biodiversity,” said Sinovas.

Fauna & Flora has set up roughly 140 camera traps within Virachey, documenting the critically endangered sunda pangolin, northern yellow-cheeked gibbon and a half-dozen other threatened species.

The national park is also the first place large-antlered muntjacs were recorded in Cambodia and is the last possible refuge for kouprey, the Kingdom’s national mammal, which has not been seen in decades.

“Virachey is one of those areas where deforestation levels have been much lower. That is partly why we have all of this wildlife,” Sinovas said. “Doing anything to damage that would not be in the national interest of Cambodia.”

He added the immediate impacts of construction are backed with longer-term threats such as poaching, illegal logging and other forest crimes common in Cambodia’s more accessible protected areas.

Earlier this year, the U.K. embassy in Phnom Penh

A ranger uses his uniform to protect the muzzle of his rifle as he makes camp within Cambodia’s Virachey National Park



Sra Er, who leads the Taveng Ranger Station in Virachey National Park, is part of the 60,000-strong Brau ethnic minority group from Cambodia, Laos and Vietnam

Pablo Sinovas, country director for Fauna & Flora in Cambodia, sets a camera trap in Virachey National Park with Ministry of Environment ranger Churt Thom



Nature reclaims a burnt logging truck in Virachey National Park, which spans the borders of Cambodia, Laos and Vietnam



Ministry of Environment ranger Phang Phorng drives past the remains of a burnt logging truck, while on a biodiversity survey in Cambodia’s Virachey National Park



The sun rises in Virachey National Park's Veal Thom grasslands, one of only two ASEAN Heritage Parks within Cambodia

confirmed about \$730,000 is earmarked for Virachey as part of Britain's global Biodiversity Landscape Fund.

Marc Thayre, deputy head of mission at the embassy, said the "vast majority of the funding" for the Mekong region is bound for Virachey.

"This is designed to increase the value of the park as a park itself," said Thayre, who hoped the funds "realign the idea of what an asset is" by putting more value to the forest if left standing than if exploited.

Thayre shifted in his seat when asked about the proposed dams.

"If you want to tackle issues, like climate change and biodiversity, then you have to work in all places in the world with all governments," he said. "We have to be honest with ourselves about the challenge and tradeoff between environment and development. There will

always be some tension there."

He also pointed to the conflict between "building things in national parks" and the "challenge of local communities not having power."

"The world changes all the time," he said. "There are always exit strategies written into any programs we do anywhere in the world. I hope that won't be the case."

Counting on credits

Cambodia's hunger for development has recently been joined with a craving for carbon credits.

Such credits are intended to limit emissions by preventing deforestation in places that might otherwise be vulnerable to development, such as Virachey. Major polluters then offset their fossil fuel emissions by

Camera trap images courtesy of Fauna & Flora in Cambodia



essentially sponsoring the protection of these forests through carbon credit purchases.

In recent months, Cambodia's carbon credits have come under scrutiny that goes beyond global questions over the effectiveness of credits as a whole.

The largest registered carbon credit zone is facing allegations of human rights abuses from the global advocacy group Human Rights Watch. In response, the world's leading carbon credit registry service, Verra, suspended issuing new credits to the Southern Cardamoms REDD+ project.

Cambodia's appetite to sell carbon credits, however, remains unsatisfied.

With the ASEAN Centre for Biodiversity, Phanith studied the feasibility of REDD+ sites in Cambodia and found about 40% of the Kingdom's total landmass – about 79,200 square kilometres – could be considered for carbon credits.

Virachey stands as one of the top carbon credit prizes.

In research conducted for the centre and viewed by the *Globe*, Phanith identified three core areas within Virachey with an estimated total carbon storage capacity of 28 million tonnes.

Phanith calculated credits for the park could be worth more than \$200 million in total if left as is, depending on the market rate for carbon. He stressed this didn't even begin to factor in the benefits of healthy hydrology, biodiversity and other ecosystem services.

If the proposed dams are built, they'd be in one of the three core areas identified by Phanith.

"If you want to develop Virachey into hydropower dams, or whatever, make sure the economic value is more than [the cost of carbon]. If it is, go ahead," he said. "But be willing to pay [that] anyways to offset."

Vying for Virachey

Dollar signs can't account for everything.

Forty seven rangers are assigned to Virachey, many are from the indigenous groups who live in the park.

Several are from the approximately 60,000-strong Brau ethnic minority group from Cambodia, Laos and Vietnam. To them, Virachey is more than a carbon sink or a potential energy source.

While on patrol, indigenous rangers laughed as they encouraged *Globe* reporters not to kill the leeches sucking on their arms, legs, neck and right ear. They called it a "forest tax" owed to Virachey. Instead of killing the leeches, rangers smoked tobacco-leaf cigarettes to ward off the blood-suckers.

As the patrol ended for the day, a shivering breeze



Ministry of Environment Sophallesh Eang gives the keynote address at the Cambodia Climate Change Summit in Siem Reap

swept in as the sunset painted the Veal Thom grasslands gold.

Sra Er, who is Brau and leads Virachey's Taveng Ranger Station, said to set alarms for 2 a.m. for star-gazing.

When the time rolled around, Er was embarrassed.

The night sky was shielded by overcast clouds and the moon's glare. To make up for the miserably early morning, Er unscrewed a gasoline canister filled with homemade rice wine.

Under the red glow of a headlamp as he sipped the spirit, Er spoke about the Brau peoples' connection to Virachey, which he said was the reason he became a ranger.

When asked about potential dams in the park, he grew silent and shook his head.


"We care about Virachey and we protect the park from what we can," he said. ■



Anton L. Delgado

By the Border: In the name of sustainability, Cambodia risks 'final frontier' for biodiversity

Anton L. Delgado is a multimedia journalist covering news and the environment across Southeast Asia. Originally from the Philippines, Delgado is a fellow with The Pulitzer Center's Rainforest Investigations Network and was most recently a senior reporter at Southeast Asia Globe.

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