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The Mekong Dams Reflections on Green Finance

The most significant changes often come after a major crisis.

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1. Introduction

In the ongoing fight against climate change, 2023 has shown to be yet another critical turning point that highlights the urgent need for coordinated global action. Unprecedented heatwaves across Europe (ESA, 2023¹), destructive wildfires in Canada (CAMS, 2024²), and catastrophic floods in Asia (AHA, 2023³), are just a few examples of the extreme weather events that have graphically illustrated the immediate consequences of climate change. These incidents act as humbling reminders of the climate crisis's relentless advancement and the need for the international community to act swiftly and forcefully (UNEP 2023⁴).

The United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol, and the Paris Agreement have all contributed to raising national aspirations and fostering international collaboration in the face of this worsening issue. Predictions following the 2015 adoption of the Paris Agreement showed that, under current practices, greenhouse gas emissions will rise by 16% by 2030. New estimates now point to a more moderate 3% increase, reflecting a greater commitment to climate action. Nevertheless, emissions must be reduced by 28% and 42%, respectively, by 2030 in order to meet the Paris Agreement's goals of keeping warming to 2°C and pursuing a 1.5°C route. (IPCC, 2023⁵).

¹ The European Space Agency (2023), *Heatwave across Europe*, available at: https://www.esa.int/ESA_Multimedia/Images/2023/07/Heatwave_across_Europe

² Copernicus Atmosphere Monitoring Service (2024), *2023: A year of intense global wildfire activity*, available at: <https://atmosphere.copernicus.eu/2023-year-intense-global-wildfire-activity>

³ AHA Centre (2023), *Weekly Disaster Update Week 50*, available at: https://ahacentre.org/wp-content/uploads/2023/12/DWeek_50_11-17Dec2023.pdf

⁴ UNEP (2023), *Emissions Gap Report 2023*, United Nations Environment Programme, available at: <https://www.unep.org/resources/emissions-gap-report-2023>.

⁵ IPCC (2023), *Climate Change 2023: Synthesis Report*, available at: https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_FullVolume.pdf

1.1. Green finance as a catalyst for climate action

At the heart of realizing the Paris Agreement's goals lies the critical role of finance. However, finance '*remains one of the most intractable barriers to accelerated climate action; but it is also an essential enabler*' (OECD 2023⁶). Article 2.1c of the Paris Agreement specifically highlights the significance of coordinating financial flows with a trajectory towards reduced greenhouse gas emissions, emphasizing finance as a vital instrument in the worldwide endeavor to tackle climate change (UNFCCC, 2015⁷).

With its ever-expanding range of financial tools, green finance is a vital catalyst for the world's transformation to a low-carbon economy, helping to accelerate and facilitate this change. At the heart of this movement are tools like carbon taxes, carbon markets, green bonds, green indexes, and green loans that direct increasing amounts of finance into initiatives that are environmentally sustainable (Ifri, 2020⁸). These projects cover an extensive variety of initiatives, including renewable energy development, biodiversity conservation, water management, energy efficiency improvements, and the reduction of greenhouse gas emissions. Green finance is not only helping the world respond to climate change by providing the crucial financial resources required for these projects, but it is also laying the groundwork for a sustainable economic future that balances ecological responsibility with economic prosperity.

Green finance has become a fast-expanding sector since the Paris Agreement and is essential to facilitating the shift to sustainable development. One of the main pillars of green finance is the market for green bonds, which has grown exponentially. Green bond issuances for sustainable projects increased from just USD 3 billion in 2011 to USD 270 billion in 2020, demonstrating the rising commitment to funding initiatives that mitigate climate change and benefit the environment (Climate Bonds Initiative, 2021⁹).

Infrastructure plays an essential part in determining pathways to growth and supporting well-being, productivity, and economic progress. However, an alarming 79% of all greenhouse gas emissions are caused by the current infrastructure in the areas of energy, transportation, buildings, and water, with the energy sector alone responsible for 37% of world emissions (UNOPS, 2021¹⁰). This underscores the critical need for a monumental transformation of infrastructure systems to align with global climate and development goals.

Along with forestry and land use considerations, investment in sustainable infrastructure is acknowledged as a crucial component of mitigation plans within Nationally Determined Contributions (NDCs). These plans cover a wide range of sector-specific initiatives meant to improve sustainability and lower emissions (UNOPS, 2021¹¹). The development of renewable

⁶ OECD (2023), *Scaling Up the Mobilisation of Private Finance for Climate Action in Developing Countries: Challenges and Opportunities for International Providers*, Green Finance and Investment, OECD Publishing, Paris.

⁷ UNFCCC (2015), *Paris Agreement*, available at: <https://unfccc.int/resource/docs/convkp/conveng.pdf>.

⁸ Deschryver, P. (2020), *Accélérer la transition énergétique : le rôle de la finance verte et ses enjeux pour l'Europe*, Études de l'Ifri, Ifri.

⁹ Climate Bonds Initiative (2021), *Record \$269.5bn green issuance for 2020: Late surge sees pandemic year pip 2019 total by \$3bn*.

¹⁰ UNOPS (2021), Thacker, S., Adshead, D., Fantini, C., Palmer, R., Ghosal, R., Adeoti, T., Morgan, G., Stratton-Short, S., *Infrastructure for Climate Action*, UNOPS, Copenhagen, Denmark.

¹¹ UNOPS (2021), Thacker, S., Adshead, D., Fantini, C., Palmer, R., Ghosal, R., Adeoti, T., Morgan, G., Stratton-Short, S., *Infrastructure for Climate Action*, UNOPS, Copenhagen, Denmark.

energy sources, increased power plant efficiency, the use of eco-friendly appliances and lighting, the expansion of electric vehicles and public transportation, the reduction of landfills and methane capture, wastewater treatment, and anaerobic digestion processes are just a few of the initiatives.

Up to 2030, an annual expenditure of USD 6.9 trillion would be needed to meet these challenging goals for development and the environment. In addition to preventing climate change, this investment is crucial for maintaining the robustness and sustainable growth of world economies in the face of environmental difficulties. (OECD, 2017¹²).

1.2. Empowering vulnerable nations through inclusive green finance

To effectively achieve rapid and substantial reductions in emissions across various sectors and regions globally, adopting an inclusive approach to finance the transition towards a low-emission future is essential. This approach must aim to significantly increase financial flows, especially in emerging markets and developing economies (EMDEs) (IPCC, 2022¹³).

Indeed, the world's most vulnerable countries, which have contributed minimally to greenhouse gas (GHG) emissions, find themselves at the forefront of climate change impacts (World Economic Forum, 2022¹⁴). These countries are the most susceptible to the adverse effects of climate change and possess the least capacity to mitigate these effects and adapt to changing environmental conditions. The disparity in contributions to global emissions versus the vulnerability to climate change underscores the urgent need for targeted financial and technological support to enable these nations to implement low-carbon infrastructure and sustainable development practices.

To support the necessary shifts and actions, it is estimated that these countries will need to mobilize a vast array of financial resources. This includes tapping into public, private, domestic, and international funds, aiming to gather around USD 1 trillion annually by 2025, and escalating to an estimated USD 2.4 trillion per year by 2030 dedicated towards climate investments (Songwe, et al. 2022¹⁵). This financial mobilization is pivotal in enabling developing countries to partake actively in the global effort to combat climate change, highlighting the critical role of comprehensive financial strategies in achieving global climate objectives.

¹² OECD (2017), *Technical note on estimates of infrastructure investment needs*, Background document to the report *Investing in Climate, Investing in Growth*, Mariana Mirabile, Virginie Marchal and Richard Baron.

¹³ IPCC (2022), *Sixth Assessment Report - Mitigation of Climate Change: Summary for Policymakers*, available at: <https://www.ipcc.ch/report/sixth-assessment-report-working-group-3/>.

¹⁴ Chao, R. (2022), *Advancing the Green Development of the Belt and Road Initiative: Harnessing Finance and Technology to Scale Up Low-Carbon Infrastructure*, INSIGHT REPORT, World Economic Forum.

¹⁵ Songwe, V., Stern, N., and Bhattacharya, A. (2022), *Finance for climate action: scaling up investment for climate and development*, available at: <https://www.lse.ac.uk/granthaminstitute/publication/finance-for-climate-action-scaling-up-investment-for-climate-and-development>.

1.3. The challenge of cohesion in green finance

Beyond the quantifiable shortfall in green finance investment, this sector faces additional challenges, including a lack of coordination and coherence between public policies and financial regulations. At times, these can be contradictory or ineffective in directing financial flows towards green projects. Indeed, institutional, legal, fiscal, and behavioral obstacles hinder the mobilization of green finance. Furthermore, subsidies or incentives that favor fossil fuels or polluting activities contradict the goals of green finance. These global subsidies for fossil fuels remain substantial, amounting to USD1 trillion in 2022 (IEA, 2023¹⁶). Moreover, gaps or asymmetries in information prevent financial actors from accurately assessing risks and opportunities related to green finance.

Another limitation is the lack of a universal and harmonized definition of what constitutes a green project, complicating the comparability, transparency, and verification of green investments (BDF, 2019¹⁷). There is a significant variety of criteria, methodologies, standards, and labels pertaining to green finance, which can differ by country, sector, actors, or financial instruments (GDI, 2017¹⁸). This diversity may lead to competitive distortions, risks of market fragmentation, and instances of greenwashing, where entities present themselves as more environmentally friendly than they are in reality.

This analysis will focus on the latter issue, examining China's 'green' investment in Southeast Asia, particularly in the development of hydroelectric infrastructure in the Lower Mekong Basin (LMB) within the framework of the Belt and Road Initiative (BRI), to highlight the risks associated with a non-uniform approach to green finance.

¹⁶ IEA (2023), Fossil Fuels Consumption Subsidies 2022, IEA, Paris, Available at: <https://www.iea.org/reports/fossil-fuels-consumption-subsidies-2022?>

¹⁷ Banque de France (2019), *La finance verte*, ABC de l'Économie, available at : https://abc-economie.banque-france.fr/sites/default/files/medias/documents/eco_bref_finance_verte.pdf

¹⁸ German Development Institute (2017), Upscaling Green Bond Markets: The Need for Harmonised Green Bond Standards, Available at: https://www.idos-research.de/uploads/media/BP_12.2017.pdf

2. Leveraging green finance in the Belt and Road Initiative

2.1. China's pivotal role in shaping green finance

As one of the world's foremost energy consumers and producers, China occupies a crucial position in the global energy landscape, simultaneously being one of the largest emitters of greenhouse gases, contributing to one-third of global GHG emissions. Despite this, China's efforts towards transitioning to a low-carbon economy are noteworthy. The reliance on coal, which still accounts for 60% of China's total power output, is a significant hurdle in improving its sustainable scores, even as the country has made substantial investments in renewable energy capacity over the years (World Bank, 2022¹⁹).

In an ambitious move towards decarbonization, China announced its 14th Five-Year Plan (NDRC, 2021²⁰) on Renewable Energy Development for 2021-2025. This plan aims to increase renewable energy generation by 50% from 2.2 trillion kWh in 2020 to 3.3 trillion kWh by 2025, setting a target for renewable electricity consumption to reach 33% by 2025, up from 28.8% in 2020. Furthermore, it mandates that 50% of China's incremental electricity and energy consumption during this period will be derived from renewable sources (World Economic Forum, 2022²¹). Demonstrating its commitment to green finance, China invested over USD 380 billion in renewable energy in 2021 alone and pioneered the development of a green bond project catalogue alongside its own Green Bond Principles (World Bank, 2022²²).

In 2021, the investment by the Chinese government in research and development (R&D) within the energy sector was reported at USD 8.3 billion, accounting for a significant 26% of global energy R&D expenditures, (IEA, 2021²³). Further emphasizing China's leadership in the renewable energy sector, employment figures surpassed 5.5 million in 2022, representing 41% of the worldwide employment total in this sector, which stood at 13.7 million (IRENA, 2023²⁴).

¹⁹ **World Bank (2022)**, *China's Transition to a Low-Carbon Economy and Climate Resilience Needs Shifts in Resources and Technologies*, Press Release, available at: <https://www.worldbank.org/en/news/press-release/2022/10/12/china-s-transition-to-a-low-carbon-economy-and-climate-resilience-needs-shifts-in-resources>.

²⁰ **National Development and Reform Commission (2021)**, *The Outline of the 14th Five-Year Plan for Economic and Social Development (2021–2025)*, available at: <https://en.ndrc.gov.cn/policies/202203/P020220315511326748336.pdf>.

²¹ **Zhu, Shouqing, et al. (2022)**, *Transition finance will accelerate decarbonization in China. Here's how*, World Economic Forum Agenda, available at: <https://www.weforum.org/agenda/2022/11/transition-finance-will-accelerate-decarbonization-in-china-here-s-how/>.

²² **World Bank Group (2022)**, *China Country Climate and Development Report*, CCDD Series, available at: <http://hdl.handle.net/10986/38136>.

²³ **International Energy Agency (2021)**, *Patents and the Energy Transition*, available at: https://iea.blob.core.windows.net/assets/d14427c6-2aa2-4422-9074-5a68940a5a96/Patents_and_the_energy_transition_-_keyfindings.pdf

²⁴ **International Renewable Energy Agency (2022)**, *Renewable energy and jobs: Annual review 2023*, available at: https://mc-cd8320d4-36a1-40ac-83cc-3389-cdn-endpoint.azureedge.net/-/media/Files/IRENA/Agency/Publication/2023/Sep/IRENA_Renewable_energy_and_jobs_2023.pdf?rev=4f65518fb5f64c9fb78f6f60fe821bf2

2.2. Green finance opportunities within the Belt and Road Initiative

The Belt and Road Initiative China's extensive infrastructure development strategy, represents an unparalleled opportunity for participating countries to pursue low-emission and resilient development pathways. Spanning over 72 countries, which include 65% of the world's population and account for 40% of global GDP, the BRI is set to facilitate the single largest flow of infrastructure financing to date. With investment commitments estimated between USD 1-1.15 trillion by 2025, the allocation of these funds towards infrastructure projects will critically influence future emissions trajectories. (WWF, HSBC, 2018²⁵).

Currently, over 50% of BRI investments in the power sector are allocated to coal-based projects, posing a significant challenge to the shift towards greener alternatives. Without a concerted effort to diversify the infrastructure investment portfolio towards more sustainable options, especially in power and transport sectors, the aggregate emissions from BRI recipient countries could significantly exceed those of China by 2040, thereby jeopardizing the objectives of the Paris Agreement (UNEP, 2018²⁶).

Confronting the environmental challenges associated with the BRI China launched a coalition for green finance within the BRI framework in 2018. The establishment of the Green Investment Principles (GIP) for the Belt and Road initiative aimed at formulating common standards and practices for green investments, represents a significant step towards integrating sustainable development goals with infrastructure financing across the BRI regions (World Economic Forum, 2022²⁷).

The GIP has quickly evolved into a global platform for action against climate change, garnering support from 41 signatories whose combined assets total over USD 49 trillion. This collective represents a significant portion of the financing power behind BRI projects, marking a pivotal shift towards green investment practices. The signatories, hailing from 15 countries and regions across Asia, Europe, and Africa, encompass a diverse group of stakeholders, including commercial and investment banks, policy banks, insurers, and both investors and developers engaged in BRI projects. Such a broad coalition highlights the extensive reach and potential impact of the GIP in promoting sustainable infrastructure development (GIP, 2021²⁸).

In a notable demonstration of commitment to global climate objectives, the GIP Steering Committee issued a statement in November 2021 expressing support for COP21 (GIP, 2021²⁹). This statement reaffirmed the signatories' dedication to assisting economies along the Belt and Road in setting and achieving ambitious climate targets that are in alignment with the goals of

²⁵ **WWF & HSBC (2018)**, *Greening the Belt and Road Initiative*, available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/25336/UN%20Environment%20Belt%20and%20Road%20Strategy_Final.pdf.

²⁶ **UN Environment (2018)**, *Green Belt and Road Strategy*, available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/25336/UN%20Environment%20Belt%20and%20Road%20Strategy_Final.pdf.

²⁷ **World Economic Forum (2022)**, *Advancing the Green Development of the Belt and Road Initiative: Harnessing Finance and Technology to Scale Up Low-Carbon Infrastructure*, INSIGHT REPORT, available at:

²⁸ **GIP (2021)**, *Green Investment Principles for the Belt and Road 2021 Annual Report*.

²⁹ **GIP (2021)**, *Statement by the GIP Steering Committee in Support of the COP26*.

the Paris Agreement, specifically the transition towards net-zero emissions. This alignment signifies a collective acknowledgement of the critical role that green finance plays not only in mitigating climate change but also in ensuring the sustainability of future infrastructure investments across the BRI.

2.3. Meeting EMDEs' energy needs through green investments

EMDEs are experiencing a significant surge in energy demand as they continue to grow, industrialize, and urbanize. According to the International Energy Agency (IEA), the rate of increase in electricity demand within EMDEs is projected to be threefold compared to that in advanced economies (IEA, 2021³⁰). Specifically, in South-East Asia, electricity demand is anticipated to expand by over 50% from 2020 to 2030 (IEA, 2020³¹).

In addressing this need, the China Development Bank embarked on 2011 on a significant hydropower infrastructure project in Laos, aspiring to transform the country into the renewable 'battery of Southeast Asia.' This initiative represents a pivotal green investment aimed at harnessing renewable energy sources to meet the region's escalating electricity demands sustainably. However, the project in Laos predates the establishment of the Green Investment Principles, and this investment also serves as a cautionary tale of the risks associated with green finance when investment standards are not clearly defined, strictly regulated and rigorously enforced which may lead to unintended consequences, both environmentally and socially.

³⁰ IEA (2021), *Financing Clean Energy Transitions in Emerging and Developing Economies*.

³¹ IEA (2020), *Stated Policies Scenario*; IEA, *Electricity Demand Outlook in Selected Regions*.

3. The Nam Ou hydropower project in Laos: an illustration of unregulated green investment risks for EMDEs

3.1. Project overview

As part of the Belt and Road Initiative, China entered into a significant investment agreement, committing USD 2.733 billion to the Nam Ou Cascade Hydropower Project in Laos (PowerChina, 2018³²). This initiative, financed in April 2011 with a loan from the China Development Bank, involves the construction of seven hydroelectric dams along the Nam Ou River in the provinces of Phongsaly and Luang Prabang, marking the first major mainstream dams on the Lower Mekong Basin. Managed by the Power Construction Corporation of China (PowerChina) in collaboration with the Lao government, the project is designed to mitigate ecological deterioration through a series of reservoirs. The project's contract model is Build-Operate-Transfer, blending private and public resources for its completion. Sinohydro, now operating under PowerChina, is tasked with construction and will hold operational rights for 29 years post-completion (International Rivers, 2017³³).

Aiming to generate a total capacity of 1.272 million kilowatts, the Nam Ou cascade dams aspire to transform Laos into the "Battery of Southeast Asia." This project not only aims to provide a significant power source for Northern Laos but also to support other development projects in the region, including the China-Laos Railway IV and V segments (PowerChina, 2018³⁴). It aligns with the Lao government's goals to leverage electricity as a key economic asset

The development of the Nam Ou cascade dams represents a pioneering move by a Chinese company in holding development rights for a foreign project and signifies PowerChina's first project executed with a global strategy under the CCP's Belt and Road Initiative.

3.2. Southeast Asia's climate vulnerability

Southeast Asia, home to 10 member states and a population of 684 million (IMF, 2024³⁵), stands at the forefront of climate change vulnerability. This region faces increasing threats from hotter weather, extended monsoon seasons, and heightened drought conditions. The coastal and

³² PowerChina (2018), *Power Construction Corporation of China: Laos Sustainability Report*.

³³ Ingram, E. (2016), *Second phase of 1,156-MW Nam Ou hydro project kicks off in Laos*, Hydro Review.

³⁴ PowerChina (2018), *Power Construction Corporation of China: Laos Sustainability Report*.

³⁵ International Monetary Fund (2024), *Data Mapper*, available at:

<https://www.imf.org/external/datamapper/LP@WEO/VNM/IDN/PHL/MMR/MYS/KHM/LAO/THA/SGP/BRN>

low-lying areas, where a significant portion of the population resides, are particularly at risk from rising sea levels (USAID, 2022³⁶).

The Global Climate Risk Index highlights the severe implications of altered rainfall patterns and temperature fluctuations for ASEAN countries, with Myanmar, the Philippines, and Thailand identified as the top three at-risk nations between 2000 and 2019 (GermanWatch, 2021³⁷). These changes pose a significant threat to the region's ecosystems and agricultural productivity, which is further exacerbated by the projection that up to 96% of Southeast Asia could experience drought conditions, with 64% facing extreme drought scenarios (UN ESCAP, 2019³⁸).

Extreme weather events, like typhoons, inflict substantial damage on the agricultural sector, disrupting economic activities and food supply chains. The devastation wrought by Typhoon Haiyan in the Philippines, which affected around 600,000 hectares of farmland and resulted in the loss of 1.1 million tons of crops, costing the agriculture sector USD 724 million, is a poignant example of such impacts (FAO, 2020³⁹).

Amidst these environmental challenges, Southeast Asia's energy market is rapidly expanding, with an 80% increase in demand since 2000 and a significant rise in CO₂ emissions due to the doubled use of fossil fuels (IEA, 2022⁴⁰). The region predominantly relies on fossil fuels for electricity, with coal and natural gas accounting for 43% and 29% of power generation in 2021, respectively. However, the share of renewable energy in the power mix has increased to 27% in 2021, up from 14% in 2014, largely due to the surge in solar and wind power, particularly in Viet Nam (World Economic Forum, 2023)⁴¹.

The green investment by China in Laos, through the development of hydropower projects, initially appears as a model investment for decarbonizing the region's energy and overcoming financial barriers to transition in a predominantly poor region. Yet, while these infrastructures may enhance the regional energy mix, they come with numerous social, economic, and environmental costs, raising questions about the legitimacy of labeling such projects as truly green.

3.3. Adverse effects of the Nam Ou Dams on the Lower Mekong Basin

The Mekong River, traversing China, Myanmar, Laos, Thailand, Cambodia and Viet Nam, serves as a lifeline for these nations. A pivotal water resource challenge in the region is the

³⁶ **United States Agency for International Development (2022)**, *Confronting the Climate Crisis in Southeast Asia*, available at: <https://www.usaid.gov/sites/default/files/2023-08/Regional%20Climate%20Fact%20Sheet%20August%202023.pdf>

³⁷ **GermanWatch (2021)**, *Global Risk Index 2021*, available online at: <https://www.germanwatch.org/en/19777>

³⁸ **United Nations Economic and Social Commission for Asia and the Pacific (2019)**, *Ready for the Dry Years: Building resilience to drought in South-East Asia*.

³⁹ **Food and Agriculture Organization of the United Nations (2020)**, *Planting the seeds of recovery in the Philippines after Typhoon Haiyan*, available at: <https://www.fao.org/in-action/planting-the-seeds-of-recovery-in-the-philippines-after-typhoon-haiyan/en/>

⁴⁰ **IEA (2022)**, *Southeast Asia Energy Outlook 2022*, IEA, Paris Available at: <https://www.fao.org/in-action/planting-the-seeds-of-recovery-in-the-philippines-after-typhoon-haiyan/en/>

⁴¹ **World Economic Forum (2023)**, *Why Southeast Asia will be critical to the energy transition*.

management and impact of the Mekong River Basin. It is projected that developments within the Mekong River Basin by 2030 will pose a more significant threat to the ecology of mainland Southeast Asia than global climate change in its entirety (NIC, 2010⁴²).

Water sharing between upstream and downstream countries is fraught with geopolitical tensions. In response to upstream hydropower dam constructions by China, which affected the four countries of the Lower Mekong Basin (Cambodia, Viet Nam, Laos, and Thailand), the Mekong River Commission was established in 1995. This initiative aimed to foster cooperation among these nations regarding water distribution along the river. Years after this effort, Laos embarked on its own hydropower projects, introducing environmental, economic, and social repercussions throughout the Lower Mekong Basin.

3.3.1. Environmental concerns

The Mekong River, ranking as the world's 10th largest and housing the largest inland fishery globally, is a bastion of biodiversity with more than 1200 fish species, second only to the Amazon (Rainboth, et al, 2012⁴³). It plays a crucial role in the ecosystem and the economy, contributing to 25% of the global freshwater catch. The river is also vital for no fewer than 20,000 species of plants, 1,200 bird species, 800 species of reptiles and amphibians, and 430 mammal species (WWF, 2024⁴⁴).

However, the river's ecological balance and the livelihoods it supports are under threat from hydropower development. The construction of dams and reservoirs along the Mekong obstructs the migratory paths of fish, essential for their spawning processes and fragments their habitats. Such disruptions have led to predictions of fish stocks declining by up to 40%, posing significant risks to biodiversity and the economy (Mekong River Commission, 2017⁴⁵).

Moreover, dams have a profound impact on the river's sediment flow, which is integral to maintaining soil fertility along the riverbanks. The reduction in sediment transport due to dam construction results in increased erosion, threatening homes, crops, and infrastructure with collapse into the river. The Mekong's sediment discharge has seen a dramatic reduction, from an average of 160 million tons annually before the construction of the first dam in 1990, to just 75 million tons in 2014 (Baran E. et al., 2015⁴⁶). This alteration in sediment flow not only changes the physical characteristics of the river but also its ecological functions.

⁴² National Intelligence Council (2010), *Southeast Asia Geopolitical Implications*, available at: https://www.dni.gov/files/documents/2010%20Conference%20Report_Southeast%20Asia_The%20Impact%20of%20Climate%20Change%20to%202030.pdf

⁴³ Rainboth, W. J., Vidthayanon, C. & Mai, D. Y. (2012), *Fishes of the Greater Mekong Ecosystem with Species List*.

⁴⁴ WWF (2024), *Greater Mekong*, available at: <https://www.worldwildlife.org/places/greater-mekong#:~:text=The%20Greater%20Mekong%20has%20no,have%20been%20catalogued%20since%201997.>

⁴⁵ Mekong River Commission (2017), *THE COUNCIL STUDY: Key Messages from the Study on Sustainable Management and Development of the Mekong River Basin, including Impact of Mainstream Hydropower Projects*, available at: <https://www.mrcmekong.org/assets/Publications/Council-Study/Council-study-Reports-discipline/CS-Key-Messages-long-v9.pdf>

⁴⁶ Baran, E., Guerin, E., Nasielski, J. (2015), *Fish, sediment and dams in the Mekong*, Penang, Malaysia: WorldFish, and CGIAR Research Program on Water, Land and Ecosystems (WLE). 108 pp.

3.3.2. Economic ramifications

Laos views the development of hydropower dams as a pivotal strategy for economic growth, poverty alleviation, and diversification of its revenue sources. As one of the poorest countries in the region, Laos heavily relies on agriculture, which accounts for 70% of employment and 25% of its GDP (UNDP, 2023⁴⁷). The country aims to export a substantial portion of the electricity generated by these dams to neighboring nations. The Laotian government projects that electricity exports could generate revenues of up to USD 5 billion annually by 2025, representing over a quarter of its 2019 GDP (Initiative for the Future of Great Rivers, 2019⁴⁸).

However, 60 million individuals depend on the river for their livelihoods, deriving income from fishing and agriculture along its banks (Winemiller et al., 2016⁴⁹) and the construction of dams presents significant challenges for downstream countries in the LMB. The dams impact water availability and distribution, exacerbating issues such as droughts, land salinization, and seawater intrusion. These challenges are particularly acute for Viet Nam, which depends on the Mekong for 95% of its water supply and is the world's second-largest rice producer. The dams could reduce the Mekong's flow to Viet Nam by 15-20% by 2030 and potentially result in a 12% loss in rice production in the Mekong Delta by 2050 (WBCSD, 2023⁵⁰). This is concerning given the projected need for a 25% increase in global rice production by 2050 to meet nutritional needs. The Mekong Delta, an economic powerhouse contributing about 20% to the national GDP (WWF, 2023⁵¹), faces a potential reduction in Viet Nam's GDP by 0.3 percentage points, amounting to over USD 1.14 billion due to the adverse effects of hydropower dams on fisheries and agriculture (MDPI, 2020⁵²).

Moreover, the Mekong Basin is the world's leading inland fishing area, with over two million tons of fish caught annually. In Cambodia, fishing contributes to 12% of the GDP, surpassing even rice production in economic significance (Initiative for the Future of Great Rivers, 2019⁵³). However, Cambodia is projected to bear three-quarters of the total reduction in fishery yields due to dam constructions, leading to a potential 3.7% decrease in the country's GDP (MDPI, 2020⁵⁴). Upstream dams' control over water flow has reduced agricultural and fishing yields downstream, posing economic losses and amplifying food security risks in a region already vulnerable to climate change impacts (Ziv G et al, 2012⁵⁵).

⁴⁷ United Nations Development Programme (2023), *Financing agrochemicals reduction and management (FARM) in Laos*, available at: <https://www.undp.org/laopdr/projects/financing-agrochemicals-reduction-and-management-farm-laos>.

⁴⁸ Initiative for the Future of Great Rivers (2019), *Mekong Study*, available at: <https://www.initiativesfleuves.org/wp-content/uploads/2019/07/Fiches-synoptiques-MEKONG.pdf>

⁴⁹ Winemiller, K.O., McIntyre, P.B., Castello, L., Fluet-Chouinard, E., Giarrizzo, T., Nam, S., Baird, I.G., Darwall, W., Lujan, N.K., Harrison, I., et al. (2016), *Balancing hydropower and biodiversity in the Amazon, Congo, and Mekong*, Science, vol. 351, pp. 128–129.

⁵⁰ World Business Council for Sustainable Development (2023), *Rice production in the Mekong Delta, Vietnam*.

⁵¹ World Wildlife Fund (2023), *Production of a documentary on the impacts of sand mining and solutions in the Viet Nameese Mekong Delta*, available at: https://wwfasia.awsassets.panda.org/downloads/term_of_reference_p00000134_documentary.pdf

⁵² Yoshida, Y., Lee, H.S., Trung, B.H., Tran, H.D., Lall, M.K., Kakar, K., Xuan, T.D. (2020), *Impacts of Mainstream Hydropower Dams on Fisheries and Agriculture in Lower Mekong Basin*, MDPI.

⁵³ Initiative for the Future of Great Rivers (2019), *Mekong Study*, available at: <https://www.initiativesfleuves.org/wp-content/uploads/2019/07/Fiches-synoptiques-MEKONG.pdf>

⁵⁴ Yoshida, Y., Lee, H.S., Trung, B.H., Tran, H.D., Lall, M.K., Kakar, K., Xuan, T.D. (2020), *Impacts of Mainstream Hydropower Dams on Fisheries and Agriculture in Lower Mekong Basin*, MDPI.

⁵⁵ Baran, E.; Nam, S.; Rodriguez-Iturbe, I.; Levin, S.A., *Trading-off fish biodiversity, food security, and hydropower in the Mekong River Basin*. Proc. Natl. Acad. Sci. USA 2012, 109, 5609–5614.

3.3.3. Social impacts

The Nam Ou River Cascade project, orchestrated by PowerChina, has significantly impacted the livelihoods and cultural fabric of thousands, forcibly relocating approximately 12,000 individuals from 127 villages to new resettlement sites, thus diminishing their access to vital natural resources and fisheries (International Rivers, 2022⁵⁶).

In an effort to mitigate the impact of these relocations, PowerChina has allocated USD 1.86 million towards the construction and repair of infrastructure, including bridges, roads, schools, and health centers, in both the surrounding and resettlement villages (PowerChina, 2018⁵⁷). Despite these efforts, reports have emerged of inadequate compensation for the displaced populations. Many of those relocated from the vicinities of other Nam Ou dams have voiced concerns over being resettled on high and unstable terrain, coupled with a lack of sufficient resources to facilitate a smooth transition to their new lives. A significant number of these individuals remain in anticipation of the compensation they were promised for the loss of their fields and orchards due to the relocations (RFA, 2020⁵⁸).

The displacement figures provided by PowerChina have been criticized for underestimating the broader impact on the livelihoods of tens of thousands more villagers within the basin. Cumulative impact assessment reports have highlighted the extent of this disruption, with at least 750 kilometers of riverbanks and nearly 2,000 homes succumbing to erosion between 2016 and August 2023 (IKI, 2024⁵⁹).

The project has also significantly affected indigenous populations, for whom the Nam Ou River and its tributaries are not merely sources of sustenance but are deeply intertwined with their cultural practices, belief systems, and identities. These communities were not given the opportunity to exercise their right to free, prior, and informed consent regarding the project, with critical information such as the project's environmental impact assessment remaining undisclosed to the public (International Rivers, 2022⁶⁰).

The process of relocating individuals as a result of infrastructure projects like dams often overlooks the critical aspect of aligning new livelihood opportunities with the displaced persons' existing skills and ways of life. This misalignment is particularly evident when fishing communities, accustomed to a life built around water bodies, are relocated to areas where

⁵⁶ **International Rivers (2022)**, *Nam Ou River Cascade Hydropower Project*, available at:

<https://thepeoplesmap.net/project/nam-ou-river-cascade-hydropower-project/?fbclid=IwAR14Dxfms6xecwINcdLguWwCiU4VyW5uUcjBA8udFJ8KFEEwQ1svO6TR4LA#sources>)

⁵⁷ **PowerChina (2018)**, *Power Construction Corporation of China: Laos Sustainability Report*.

⁵⁸ **Radio Free Asia (2020)**, *Report by RFA's Lao Service*, available at: <https://www.rfa.org/english/news/laos/landslides-11102020160115.html>

⁵⁹ **Internationale Klimaschutz Initiative (2024)**, *Drifting Sands: Mitigating the impacts of climate change in the Mekong Delta by engaging the private and public sectors in the sand industry*, available at: <https://www.international-climate-initiative.com/en/project/drifting-sands-mitigating-the-impacts-of-climate-change-in-the-mekong-delta-by-engaging-the-private-and-public-sectors-in-the-sand-industry-19-ii-171-vnm-a-sustainable-sand-mining/>

⁶⁰ **International Rivers (2022)**, *Nam Ou River Cascade Hydropower Project*, available at:

<https://thepeoplesmap.net/project/nam-ou-river-cascade-hydropower-project/?fbclid=IwAR14Dxfms6xecwINcdLguWwCiU4VyW5uUcjBA8udFJ8KFEEwQ1svO6TR4LA#sources>)

agriculture is the primary means of subsistence. Such transitions can prove to be profoundly challenging, as these individuals may lack the requisite farming skills, leading to difficulties in adapting to their new environments (Gyau, Boakye, 2001⁶¹).

The Akosombo Dam, constructed in 1965, serves as a poignant example of the dire consequences of insufficiently planned resettlement strategies. The dam's construction resulted in the displacement of approximately 80,000 people, who were forced to contend with the loss of fertile land and the subsequent collapse of rural economies. This disruption precipitated a severe decline in living standards, pushing communities into intense poverty. The economic desperation faced by these communities led to unforeseen social ramifications, including an increase in prostitution as a means of survival. This, in turn, triggered an HIV crisis, with the spread of the virus being exacerbated by the migration of affected individuals, thereby contributing to a national health emergency in Ghana (Sauvé et al., 2002⁶²).

While the number of people displaced in the Lower Mekong Basin countries may be less than those affected by the Akosombo Dam, the economic and political fragility of the region raises significant concerns. The socio-economic disruptions caused by large-scale resettlements can have far-reaching implications, potentially exacerbating vulnerabilities and contributing to the risk of child prostitution in a region already deemed fragile and susceptible to such exploitative practices (UNODC, 2014⁶³).

⁶¹ Gyau-Boakye, P. (2001), *Environmental impacts of the akosombo dam and effects of climate change on the lake levels*, *Environment, Development and Sustainability*, 3(1), 17–29.

⁶² Sauvé, N., Dzokoto, A., Opare, B., Kaitoo, E.E., Khonde, N., Mondor, M., Bekoe, V., & Pépin, J. (2002), *The price of development: HIV infection in a semiurban community of Ghana*.

⁶³ United Nations Office on Drugs and Crime (2014), *Protecting the Future: Improving the response to child sex offending in Southeast Asia*, available at: https://www.unodc.org/roseap/uploads/archive/documents/Publications/2015/childhood/2014.08.28.Protecting_the_Future-Responding_to_CSO.pdf

4. Conclusion

The negative impacts of hydroelectric dams in the Mekong River raise profound questions about the appropriateness and fairness of labeling these projects as ‘green’ investments. This label suggests a commitment to environmental protection and climate action, in line with the principles of sustainable finance, which aims to support projects that are not only environmentally beneficial but also considerate of social and governance dimensions. However, the situation in the Mekong River underscores a troubling discrepancy between the ideals of green finance and the reality of its application.

The challenges posed by hydroelectric dams on the Mekong River underscore the current inadequacies in green finance, which lacks sufficient international harmonization, regulation, and oversight (BDF, 2019⁶⁴). These issues reveal that sustainable finance cannot merely be a label but must be based on objective, transparent, and verifiable criteria that consider the environmental, social, and economic impacts of funded projects. The ambiguity in defining green finance activities and products, such as green loans and green bonds, creates barriers for investors, companies, and banks aiming to pursue green investment opportunities (G20, 2016⁶⁵). This situation highlights the urgent need for clear guidelines and standards in green finance.

The global consensus underscores the necessity of aligning with the Paris Agreement's objectives, advocating for enhanced climate initiatives alongside a just and inclusive transition. This approach aims to mitigate inequalities, ensuring equitable opportunities across society. It is imperative for governments to foster a transition that universally benefits, particularly safeguarding against adverse impacts on impoverished and vulnerable communities (OECD, 2018⁶⁶).

In this context, China's green investment endeavors within the Belt and Road Initiative emerge as pivotal in integrating EMDEs into this global transformation. These investments offer a unique chance for these nations to align with global advancements. Nonetheless, it is crucial that such investments and projects undergo stringent regulation, comprehensive oversight, and control. The integration of Environmental and Social Impact Assessments, alongside Life Cycle Assessment practices, is essential at every design and construction phase of these initiatives, ensuring that they adhere to the highest standards of sustainability and social responsibility.

Moreover, it is imperative that green finance does not compromise the rights and interests of local populations. The involvement, consultation, and informed participation of communities

⁶⁴ **Banque de France (2019)**, *La finance verte*, ABC de l'Économie, available at : https://abc-economie.banque-france.fr/sites/default/files/medias/documents/eco_bref_finance_verte.pdf

⁶⁵ **G20 Green Finance Study Group (2016)**, *Green Finance Synthesis Report*, p.10.

⁶⁶ **OECD (2018)**, *Financing Climate Futures: Rethinking Infrastructure*, available at: <https://www.oecd.org/environment/cc/climate-futures/policy-highlights-financing-climate-futures.pdf>.

in the decision-making and implementation processes of financed projects are crucial. Lastly, the success of green finance requires enhanced cooperation and dialogue among the countries involved, adhering to principles of solidarity, equity, and shared responsibility. This collaborative approach is essential for achieving the goals set forth in international climate agreements and for the effective implementation of green finance projects (LSE, 2022⁶⁷).

The pivotal role of international organizations such as the OECD in fostering the development of global green finance is undeniable. With its wealth of expertise, support, and policy recommendations, the OECD is uniquely positioned to address the current shortcomings and bolster the effectiveness and credibility of green finance. It plays a critical role in developing a "universal taxonomy" for green activities, enabling objective descriptions, comparisons, and the establishment of standards and labels that guide market participants' decisions (European Investment Bank, 2017⁶⁸). This effort is crucial for creating a common language in green finance, ensuring that financial products truly contribute to environmental sustainability.

Moreover, the OECD's contributions to formulating principles, guidelines, indicators, and tools are essential for assisting countries in implementing effective green finance policies, institutions, and instruments. The establishment of the OECD Green Finance and Investment Centre epitomizes the organization's commitment to catalyzing and supporting the transition to a green economy through data production, analysis, dissemination of best practices, and facilitating dialogue platforms like the annual OECD Forum on Green Finance and Investment.

Green finance represents a significant opportunity in the energy transition and the fight against climate change. It necessitates strengthened cooperation, increased harmonization, and ongoing innovation to fulfill the objectives of the Paris Agreement and sustainable development goals. The case of hydroelectric dams in the Mekong River underscores that green finance is not a panacea but requires thorough evaluation and careful monitoring of its environmental, social, and economic impacts. Ultimately, green finance must prioritize the preservation of nature, its biodiversity and the well-being of humanity rather than compromise them.

⁶⁷ **London School of Economics (2022)**, *Finance for climate action: Scaling up investment for climate and development. Report of the Independent High-Level Expert Group on Climate Finance*, available at: <https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2022/11/IHLEG-Finance-for-Climate-Action-1.pdf>

⁶⁸ **European Investment Bank (2017)**, *The need for a common language in Green Finance: Towards a standard-neutral taxonomy for the environmental use of proceeds*.